

GPRS G3

AT Commands Reference Guide

G3 AT Commands Reference Guide for the following products:

MTSMC-G3-xx, MTR-G3-xx, MTC-G3-xx

Part Number S000545A, Revision A

Copyright

This publication may not be reproduced, in whole or in part, without prior expressed written permission from Multi-Tech Systems, Inc. All rights reserved. Copyright © 2013, by Multi-Tech Systems, Inc.

Multi-Tech Systems, Inc. makes no representations or warranty with respect to the contents hereof and specifically disclaim any implied warranties of merchantability or fitness for any particular purpose. Furthermore, Multi-Tech Systems, Inc. reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Multi-Tech Systems, Inc. to notify any person or organization of such revisions or changes.

Trademarks

Multi-Tech and the Multi-Tech logo are registered trademarks of Multi-Tech Systems, Inc.

Contacting Multi-Tech**Knowledge Base**

The Knowledge Base provides immediate access to support information and resolutions for all Multi-Tech products.

Visit <http://www.multitech.com/kb.go>.

Support Portal

To create an account and submit a support case directly to our technical support team, visit: <https://support.multitech.com>

Technical Support

Business Hours: M-F, 9am to 5pm CT

Country	By Email	By Phone
Europe, Middle East, Africa:	support@multitech.co.uk	+(44) 118 959 7774
U.S., Canada, all others:	support@multitech.com	(800) 972-2439 or (763) 717-5863

World Headquarters

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, Minnesota 55112
Phone: 763-785-3500 or 800-328-9717
Fax: 763-785-9874

Warranty

To read the warranty statement for your product, please visit: <http://www.multitech.com/warranty.go>.

Contents

Introduction.....	21
Formatting Conventions Overview	21
AT Command Syntax	21
String Type Parameters.....	22
Command Lines.....	22
Information Responses and Result Codes	23
Command Response Timeout.....	24
Command Issuing Timing.....	26
Storing Values Set by Commands Overview	27
Factory Profile and User Profiles	27
Format for Entering AT Commands.....	30
Command Line Prefixes.....	30
Starting A Command Line AT	30
Last Command Automatic Repetition A/	30
Repeat Last Command AT#/	30
Remotely Issuing AT Commands.....	31
Configuring SMS AT Run	31
Example.....	31
V.250 AT Commands	33
Generic Modem Control	33
Set to Factory-Defined Configuration &F.....	33
Soft Reset Z	33
Select Active Service Class +FCLASS	33
Default Reset Basic Profile Designation &Y	34
Default Reset Full Profile Designation &P	34
Store Current Configuration &W	35
Store Telephone Number &Z	35
Display Stored Numbers &N	36
Manufacturer Identification +GMI	36
Model Identification +GMM	36
Revision Identification +GMR.....	36
Capabilities List +GCAP.....	37
Serial Number +GSN.....	37
Display Configuration and Profile &V.....	37

Display Configuration and Profile &V0	38
S Registers Display &V1.....	38
Extended S Registers Display &V3	39
Display Last Connection Statistics &V2	39
Single Line Connect Message \V	39
Country of Installation +GCI.....	40
Master Reset +CMAR	40
DTE Modem Interface Control	40
Command Echo E	40
Quiet Result Codes Q	41
Response Format V	41
Extended Result Codes X.....	42
Identification Information I.....	42
Data Carrier Detect (DCD) Control &C	43
Data Terminal Ready (DTR) Control &D	43
Standard Flow Control \Q	44
Flow Control &K	45
Data Set Ready (DSR) Control &S.....	45
Ring (RI) Control \R	46
Fixed DTE Interface Rate +IPR.....	46
DTE – Modem Local Flow Control +IFC	47
DTE – Modem Local Rate Reporting +ILRR	47
DTE – Modem Character Framing +ICF	48
Call Control.....	49
Dial D	49
Return to on-line mode O	51
Answer A	51
Disconnect H	52
Compression Control	52
Data Compression Reporting +DR.....	52
S Parameters	53
Number of Rings to Auto Answer S0.....	53
Ring Counter S1.....	53
Escape Character S2.....	54
Command Line Termination Character S3	54
Response Formatting Character S4.....	55
Command Line Editing Character S5.....	55

Connection Completion Timeout S7	56
Escape Prompt Delay S12	56
Delay to DTR Off S25	57
Disconnect Inactivity Timer S30	57
Delay Before Forced Hang Up S38	57
3GPP TS 27.007 AT Commands	59
General.....	59
Request Manufacturer Identification +CGMI.....	59
Request Model Identification +CGMM	59
Request Revision Identification +CGMR	59
Request Product Serial Number Identification +CGSN	60
Select TE Character Set +CSCS	60
International Mobile Subscriber Identity (IMSI) +CIMI.....	60
Multiplexing Mode +CMUX.....	61
Select Preferred MT Power Class +CPWC	62
Call Control.....	63
Hang Up Call +CHUP.....	63
Select Bearer Service Type +CBST	63
Radio Link Protocol +CRLP	64
Service Reporting Control +CR	65
Extended Error Report +CEER	65
Cellular Result Codes +CRC	66
Single Numbering Scheme +CSNS	67
Voice Hang Up Control +CVHU.....	67
Network Service Handling.....	68
Subscriber Number +CNUM.....	68
Read Operator Names +COPN	68
Network Registration Report +CREG	69
Operator Selection +COPS	71
Facility Lock/Unlock +CLCK.....	72
Change Facility Password +CPWD.....	73
Calling Line Identification Presentation +CLIP	74
Calling Line Identification Restriction +CLIR.....	75
Call Forwarding Number and Conditions +CCFC.....	76
Call Waiting +CCWA	77
Call Holding Services +CHLD.....	79
Unstructured Supplementary Service Data +CUSD.....	80

Advice of Charge +CAOC	81
List Current Calls +CLCC.....	82
SS Notification +CSSN.....	83
Closed User Group +CCUG	84
Preferred Operator List +CPOL.....	84
Selection of preferred PLMN list +CPLS	85
Call Deflection +CTFR	86
Mobile Equipment Control.....	86
Phone Activity Status +CPAS	86
Set Phone Functions +CFUN.....	87
Enter PIN +CPIN.....	88
Signal Quality +CSQ.....	90
Indicator Control +CIND	91
Mobile Equipment Event Reporting +CMER	93
Select Phonebook Memory Storage +CPBS	94
Write Phonebook Entry +CPBW	95
Read Phonebook Entries +CPBR.....	96
Find Phonebook Entries +CPBF	97
Clock Management +CCLK	98
Alarm Management +CALA	99
Delete Alarm +CALD	101
Setting Date Format +CSDF	101
Setting Time Format +CSTF	102
Time Zone Reporting +CTZR.....	103
Automatic Time Zone Update +CTZU.....	103
Restricted SIM Access +CRSM	104
Alert Sound Mode +CALM.....	105
Ringer Sound Level +CRSL	105
Loudspeaker Volume Level +CLVL.....	106
Microphone Mute Control +CMUT	107
Silence Command +CSIL	107
Accumulated Call Meter +CACM.....	108
Accumulated Call Meter Maximum +CAMM	109
Price per Unit and Currency Table +CPUC	109
Call Meter Maximum Event +CCWE.....	110
Generic SIM Access +CSIM	110
Mobile Equipment Errors.....	113

Report Mobile Equipment Error +CMEE	113
Set CMEE Mode #CMEEMODE	113
Voice Control	114
DTMF Tones Transmission +VTS	114
Tone Duration +VTD	115
Commands for GPRS	115
GPRS Mobile Station Class +CGCLASS	115
GPRS Attach or Detach +CGATT	116
GPRS Event Reporting +CGEREP	116
GPRS Network Registration Status +CGREG	118
Define PDP Context +CGDCONT	119
Quality of Service Profile +CGQMIN	120
Quality of Service Profile +CGQREQ	121
PDP Context +CGACT	122
Show PDP Address +CGPADDR	123
Enter Data State +CGDATA	124
Modify PDP Context +CGCMOD	125
Commands for Battery Charger	125
Battery Charge +CBC	125
3GPP TS 27.005 AT Commands for SMS and CBS	127
General Configuration	127
Select Message Service +CSMS	127
Preferred Message Storage +CPMS	128
Message Format +CMGF	129
Message Configuration	130
Service Center Address +CSCA	130
Set Text Mode Parameters +CSMP	130
Show Text Mode Parameters +CSDH	134
Select Cell Broadcast +CSCB	135
Save Settings +CSAS	136
Restore Settings +CRES	137
Message Receiving and Reading	138
New Message Indications to Terminal Equipment +CNMI	138
List Messages +CMGL	143
Read Message +CMGR	146
PDU Mode	146
Message Sending and Writing	149

Send Message +CMGS.....	149
Write Message to Memory +CMGW.....	151
Send Message from Storage +CMSS	155
Delete Message +CMGD	156
Select Service for MO SMS Messages +CGSMS	157
Custom AT Commands	158
General Configuration AT Commands	158
Network Selection Menu Availability +PACSP	158
Manufacturer Identification #CGMI.....	158
Model Identification #CGMM	159
Revision Identification #CGMR	159
Product Serial Number Identification #CGSN	159
International Mobile Subscriber Identity (IMSI) #CIMI.....	159
Read ICCID (Integrated Circuit Card Identification) #CCID.....	160
Service Provider Name #SPN	160
Extended Numeric Error Report #CEER	161
Extended Error Report for Network Reject Cause #CEERNET.....	163
Select Registration Operation Mode #REGMODE.....	165
SMS Commands Operation Mode #SMSMODE	165
PLMN List Selection #PLMNMODE.....	166
Display PIN Counter #PCT	166
Software Shut Down #SHDN	167
Extended Reset #Z.....	167
Periodic Reset #ENHRST.....	167
Wake from Alarm Mode #WAKE.....	168
Query Temperature Overflow #QTEMP.....	169
Temperature Monitor #TEMPMON	170
SMS Ring Indicator #E2SMSRI	171
Read Analog/Digital Converter Input #ADC	172
V24 Output Pins Mode #V24MODE	173
V24 Output Pins Configuration #V24CFG.....	174
V24 Output Pins Control #V24	175
RF Transmission Monitor Mode #TXMONMODE.....	175
Battery and Charger Status #CBC.....	176
GPRS Auto-Attach Property #AUTOATT.....	177
Multislot Class Control #MSCLASS	177
Cell Monitor #MONI.....	178

Serving Cell Information #SERVINFO	180
Network Survey of Timing Advance #CSURVTA	181
Query SIM Status #QSS	183
ATD Dialing Mode #DIALMODE	184
Automatic Call #ACAL	185
Extended Automatic Call #ACALEXT	186
Extended Call Monitoring #ECAM	186
SMS Overflow #SMOV	187
Mailbox Numbers #MBN	188
Message Waiting Indication #MWI	189
Audio Codec #CODEC	190
Network Timezone #NITZ	191
Enhanced Network Selection #ENS	192
Select Band #BND	193
Automatic Band Selection #AUTOBND	193
Lock to Single Band #BNDLOCK	194
Skip Escape Sequence #SKIPESC	195
Escape Sequence Guard Time #E2ESC	195
PPP-GPRS Connection Authentication Type #GAUTH	196
PPP-GPRS Parameters Configuration #GPPPCFG	196
Enables/Disables PPP Compression #GPPPCFGEXT	197
RTC Status #RTCSTAT	198
GSM Antenna Detection #GSMAD	198
SIM Detection Mode #SIMDET	200
SIM Enhanced Speed #ENHSIM	200
Subscriber number #SNUM	201
SIM Answer to Reset #SIMATR	201
CPU Clock Mode #CPUMODE	202
GSM Context Definition #GSMCONT	202
IPEGSM #GSMCONTCFG	203
Show Address #CGPADDR	203
Network Scan Time #NWSCANTMR	205
Call Establishment Lock #CESTHLCK	205
Phone Activity Status #CPASMODE	206
ICCID SIM File Reading Mode #FASTCCID	206
Power Saving Mode Ring #PSMRI	207
Software Level Selection #SWLEVEL	208

Command Mode Flow Control #CFLO.....	208
Report Concatenated SMS Indexes #CMGLCONCINDEX.....	209
Codec Information #CODECINFO	209
Second Interface Instance #SII	212
Select Language #LANG.....	213
Call Forwarding Flags #CFF.....	213
Hang Up Call #CHUP.....	214
Set Encryption Algorithm #ENCALG	214
Read Current Network Status #RFSTS.....	216
Set CMUX Mode #CMUXMODE	217
Set AT Interface and Trace Interface #PORTCFG	217
AT Run Commands	218
Enable SMS Run AT Service #SMSATRUN	218
Set SMS Run AT Service Parameters #SMSATRUNCFG	219
SMS AT Run White List #SMSATWL.....	220
Set TCP Run AT Service Parameter #TCPATRUNCFG	220
TCP Run AT Service in Listen Server Mode #TCPATRUNL	222
TCP AT Run Firewall List #TCPATRUNFRWL	223
TCP AT Run Authentication Parameters List #TCPATRUNAUTH	224
TCP AT Run in Dial (Client) Mode #TCPATRUND.....	225
Closing TCP Run AT Socket #TCPATRUNCLOSE	225
TCP Run AT Command Sequence #TCPATCMDSEQ	226
TCP Run AT Service to a Serial Port #TCPATCONSER	226
Run AT Command Execution #ATRUNDELAY	227
Event Monitor Commands	228
Enable EvMoni Service #ENAEVMONI	228
EvMoni Service Parameter #ENAEVMONICFG.....	228
Event Monitoring #EVMONI.....	229
Send Message #CMGS.....	232
Write Message to Memory #CMGW.....	233
CONSUME Commands	235
Configure Consume Parameters #CONSUMECFG.....	235
Enable Consume Functions #ENACONSUME	237
Report Consume Statistics #STATSCONSUME	238
Block or Unblock a Service Type #BLOCKCONSUME.....	239
FOTA Commands.....	240
OTA Set Network Access Point #OTASNAP	240

OTA Set User Answer #OTASUAN	241
OTA Set Ring Indicator #OTASETRI.....	242
Saves IP port and IP address for OTA over IP #OTAIPCFG	243
Starts an OTA Update over IP #OTAIPUPD.....	244
OTA Set IP port and address for OTA over IP #OTASNAPIP	244
OTA Set Access Point Name for OTA over IP #OTASNAPIPCFG	245
Multisocket AT Commands.....	247
Socket Status #SS	247
Syntax.....	247
Parameters and Values	247
Notes.....	247
Examples	248
Socket Info #SI	248
Syntax.....	248
Parameters and Values	248
Notes.....	249
Examples	249
Context Activation #SGACT	250
Syntax.....	250
Parameters and Values	250
Notes.....	250
Socket Shutdown #SH	251
Syntax.....	251
Parameters and Values	251
Socket Configuration #SCFG.....	251
Syntax.....	251
Parameters and Values	252
Notes.....	252
Examples	252
Socket Configuration Extended #SCFGEXT.....	252
Syntax.....	253
Parameters and Values	253
Notes.....	254
Examples	254
Socket Configuration Extended 2 #SCFGEXT2.....	254
Syntax.....	255
Parameters and Values	255

Notes.....	256
Examples	256
Socket Dial #SD	257
Syntax.....	257
Parameters and Values	257
Notes.....	257
Examples	258
Socket Restore #SO	258
Syntax.....	258
Parameters and Values	258
Socket Listen #SL	258
Syntax.....	259
Notes.....	259
Examples	259
Socket Listen UDP #SLUDP	260
Syntax.....	260
Parameters and Values	260
Notes.....	260
Examples	260
Socket Accept #SA	261
Syntax.....	261
Parameters and Values	261
Notes.....	261
Receive Data in Command Mode #SRECV.....	261
Syntax.....	261
Parameters and Values	262
Notes.....	262
Examples	262
Send Data in Command Mode #SEND	263
Syntax.....	263
Parameters and Values	263
Notes.....	263
Examples	264
Send Data in Command Mode Extended #SENDEXT	264
Syntax.....	264
Parameters and Values	264
Notes.....	264

Examples	264
IP Stack Authentication Type #SGACTAUTH.....	265
Syntax.....	265
Parameters and Values	265
Notes.....	265
Context Activation and Configuration #SGACTCFG.....	265
Syntax.....	266
Parameters and Values	266
Notes.....	266
Context Activation and Configuration Extended #SGACTCFGEXT.....	266
Syntax.....	267
Parameters and Values	267
Notes.....	267
PAD Command Features #PADCMD.....	267
Syntax.....	268
Parameters and Values	268
Notes.....	268
PAD Forward Character #PADFWD	268
Syntax.....	268
Parameters and Values	268
Notes.....	268
Base64 Encoding/Decoding of Socket Sent/Received Data #BASE64.....	269
Syntax.....	269
Parameters and Values	269
Notes.....	270
Examples	270
Send UDP Data to a Specific Remote Host #SENDUDP	271
Syntax.....	271
Parameters and Values	271
Notes.....	271
Examples	271
Send UDP Data to Specific Remote Host Extended #SENDUDPEXT	273
Syntax.....	273
Parameters and Values	273
Socket Type #ST.....	273
Syntax.....	273
Parameters and Values	273

Notes.....	274
Examples	274
Detect the Cause of Socket Disconnection #SLASTCLOSURE.....	275
Syntax.....	275
Parameters and Values	275
Notes.....	275
FTP AT Commands	276
FTP Time-Out #FTPTO	276
FTP Open #FTPOPEN	276
FTP Close #FTPCLOSE	277
FTP Put #FTPPUT	277
FTP Get #FTPGET	277
FTP GET in Command Mode #FTPGETPKT	278
FTP Type #FTPTYPE.....	279
FTP Read Message #FTPMSG	279
FTP Delete #FTPDELE.....	279
FTP Print Working Directory #FTPPWD	280
FTP Change Working Directory #FTPCWD.....	280
FTP List #FTPLIST	280
Get File Size #FTPFSIZE	281
FTP Append #FTPAPP	281
Send Data on FTP Data Port while in Command Mode #FTPAPPEXT	283
Set Restart Position #FTPREST.....	284
Receive Data in Command Mode #FTP_RECV	285
FTP Configuration #FTPCFG.....	286
Single Socket AT Commands.....	288
Socket Parameters Reset #SKTRST.....	288
Syntax.....	288
Notes.....	288
Example.....	288
Enhanced IP Stack Extension AT Commands	289
Query DNS #QDNS.....	289
Syntax.....	289
Parameters and Values	289
Notes.....	289
Example.....	289
DNS Response Caching #CACHEDNS	289

Syntax.....	290
Parameters and Values	290
Notes.....	290
Example.....	290
Manual DNS Selection #DNS	291
Syntax.....	291
Parameters and Values	291
Notes.....	291
DNS from Network #NWDNS	291
Syntax.....	292
Parameters and Values	292
Notes.....	292
GPRS Context Activation #GPRS.....	292
Socket Listen Ring Indicator #E2SLRI.....	294
Syntax.....	294
Parameters and Values	294
Firewall Setup #FRWL.....	294
Syntax.....	294
Parameters and Values	295
Data Volume #GDATAVOL.....	295
Syntax.....	295
Parameters and Values	296
Notes.....	296
Example.....	296
ICMP Ping Support #ICMP	297
Syntax.....	297
Parameters and Values	298
Maximum TCP Payload Size #TCPMAXDAT	298
TCP Reassembly #TCPREASS	298
PING Request #PING	299
Syntax.....	299
Parameters and Values	299
Notes.....	299
Example.....	300
E-mail Management AT Commands.....	301
E-mail SMTP Server #ESMTP	301
E-mail Sender Address #EADDR	301

E-mail Authentication User Name #EUSER	302
E-mail Authentication Password #EPASSW	303
E-mail Sending with GPRS Context Activation #SEMAIL	303
E-mail GPRS Context Activation #EMAILACT	304
E-mail Sending #EMAILD	306
E-mail Parameters Save #ESAV	307
E-mail Parameters Reset #ERST	307
SMTP Read Message #EMAILMSG	307
Send Mail with Attachment #SMTPCL	308
Calculate and Update Date and Time #NTP	309
Easy Scan® Extension AT Commands	311
Network Survey #CSURV	311
Network Survey (Numeric Format) #CSURVC	313
Network Survey of User Defined Channels #CSURVU	316
Network Survey of User Defined Channels (Numeric Format) #CSURVUC	317
BCCH Network Survey #CSURVB	317
BCCH Network Survey (Numeric Format) #CSURVBC	318
Network Survey Format #CSURVF	318
Remove <CR><LF> on Easy Scan Commands Family #CSURVNLF	319
Extended Network Survey #CSURVEXT	319
PLMN Network Survey #CSURVP	320
PLMN Network Survey (Numeric Format) #CSURVPC	320
SIM Toolkit Commands	321
SIM Toolkit Interface Activation #STIA	321
SIM Toolkit Get Information #STGI	325
SIM Toolkit Send Response #STSR	330
SIM Toolkit Terminal Attach #STTA	331
Jammed Detect and Report AT Commands	332
Jammed Detect and Report #JDR	332
Jammed Detect and Report Enhanced #JDRENH	334
Easy Script® Extension Python Interpreter Commands	337
Write Script #WSCRIPT	337
Select Active Script #ESCRIPT	338
Script Execution Start Mode #STARTMODESCR	339
Execute Active Script #EXECSCR	339
Read Script #RSCRIPT	340
List Script Names #LSCRIPT	340

List Script Names #LCSCRIPT	341
Delete Script #DSCRIPT	343
Reboot #REBOOT.....	344
MMS Commands.....	345
Set Network Parameters for MMS #MMSSET.....	345
Syntax.....	345
Parameters and Values	345
Notes.....	345
General Setting #MMSG.....	346
Syntax.....	346
Parameters and Values	346
Notes.....	346
Create/Update MMS Message Mailing List #MMSTO	347
Syntax.....	347
Parameters and Values	347
Notes.....	347
Example.....	347
Send a MMS Message #MMSEND	347
Syntax.....	347
Parameters and Values	348
Notes.....	348
Example.....	348
Add MMS Attachment #MMSATTD	349
Syntax.....	349
Parameters and Values	349
Notes.....	349
HTTP Last Message #MMSMSG	350
Syntax.....	350
Set Notification Handling #MMSSNH.....	350
Syntax.....	350
Parameters and Values	350
Example.....	351
List Notifications #MMSLN.....	352
Syntax.....	352
Get MMS #MMSGET	352
Syntax.....	352
Parameters and Values	352

Forward MMS #MMSFWD	352
Syntax.....	353
Parameters and Values	353
Notes.....	353
Delete MMS from the MMS Proxy Server #MMSDEL	353
Syntax.....	353
Parameters and Values	353
Notes.....	353
List MMS Files #MMSLIMG	353
Syntax.....	354
Delete Image File #MMSDIMG.....	354
Syntax.....	354
Parameters and Values	354
Notes.....	354
HTTP Client Commands	355
Configure HTTP Parameters #HTTPCFG	355
Syntax.....	355
Parameters and Values	355
Notes.....	356
Send HTTP Get, Head, or Delete Request #HTTPQRY	356
Syntax.....	356
Parameters and Values	356
Notes.....	357
Sent HTTP POST or PUT Request #HTTPPSND.....	357
Syntax.....	357
Parameters and Values	358
Notes.....	358
Example.....	359
Receive HTTP Server Data #HTTPPRCV	359
Syntax.....	359
Parameters and Values	359
Notes.....	359
SAP AT Commands	360
Remote SIM Enable #RSEN.....	360
Tones Configuration	362
Signaling Tones Mode #STM	362
Tone Playback #TONE.....	362

Extended Tone Generation #TONEEXT	363
Tone Classes Volume #TSVOL	363
User Defined Tone SET #UDTSET command	365
User Defined Tone SAVE #UDTSAV command	366
User Defined Tone Reset #UDTRST command	367
Audio Profile Commands	368
Audio Profile Selection #PSEL	368
Audio Profile Configuration Save #PSAV	368
Audio Profile Factory Configuration #PRST	369
Audio Filter Commands	370
Uplink Path Biquad Filters #BIQUADIN	370
Extended Uplink Biquad Filters #BIQUADINEX	370
Cascaded Filters #BIQUADOUT	371
Extended Downlink Biquad Filters #BIQUADOUTEX	372
Echo Cancellation Configuration Commands	374
Audio Profile Setting #PSET	374
Handsfree Configuration #HFCFG	375
TX Noise Injector Configuration #TXCNI	376
Handsfree Echo Cancellation #SHFEC	376
Handset Echo Cancellation #SHSEC	377
Echo Reducer Configuration #ECHOCFG	377
Handset Automatic Gain Control #SHSAGC	378
Handset Noise Reduction #SHSNR	379
Handsfree Automatic Gain Control #SHFAGC	379
Handsfree Noise Reduction #SHFNR	380
Embedded DTMF Decoder Commands	381
Embedded DTMF Decoder Enabling #DTMF	381
Embedded DTMF Decoder Configuration #DTMFCFG	381
Digital Voice Interface	383
Digital Voiceband Interface #DVI	383
Miscellaneous Commands	384
PCM Play and Receive #SPCM	384
Teletype Writer #TTY	385
Emergency Call and eCall Management	386
Dial an Emergency Call #EMRGD	386
SSL Commands	388
Configure SSL Socket General Parameters #SSLCFG	388

Opening a Socket SSL to a Remote Server #SSLD.....	389
Enabling a Socket SSL #SSLEN	390
Fast Redial of an SSL Socket #SSLFASTD.....	390
Close an SSL Socket #SSLH.....	391
Restore an SSL Socket after a +++ #SSLO	392
Read Data from an SSL Socket #SSLRECV.....	392
Reporting the status of an SSL Socket #SSLS.....	394
Configure Security Parameters SSL Socket #SSLSECCFG.....	394
Managing Security Data #SSLSECDATA	395
Sending Data through an SSL Socket #SSLSEND.....	397
AT Parser Abort.....	398
CME Error List	399
Mobile Equipment (ME) Error Result Code - +CME ERROR: <err>	399
CMS Error List	403
Message Service Failure Result Code - +CMS ERROR: <err>.....	403
Acronyms.....	404

Introduction

This guide describes the AT commands:

- V.250 general AT command set, in order to maintain the compatibility with existing SW programs.
- 3GPP TS 27.007 specific AT command and GPRS specific commands.
- 3GPP TS 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service).
- GPS and Fax Class 1 compatible commands.
- Standard AT commands and proprietary AT commands help you control your product.

Formatting Conventions Overview

The following syntactical definitions apply:

- <CR> Carriage return character is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255, is specified within parameter S3. **Default: 13.**
- <LF> Linefeed character is the character recognized as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter S4. The line feed character is output after carriage return character if verbose result codes are used (V1 option used) otherwise, if numeric format result codes are used (V0 option used) it does not appear in the result codes. **Default: 10.**
- <...> Name enclosed in angle brackets is a syntactical element. They do not appear in the command line.
- [...] Optional subparameter of a command or an optional part of Terminal Adapter (TA) information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in AT commands which have a read command, new value equals its previous value. For AT commands that do not store the values of any of their subparameters—which are called action type commands and do not have a read command—action performed based on the recommended default setting of the subparameter.

AT Command Syntax

The syntax rules followed by commands in this guide are similar to those of standard basic and extended AT commands.

There are two types of extended commands:

- **Parameter type commands.** This type of command may be:
 - “set” to store a value or values for later use.
 - “read” to determine the current value or values stored.
 - “test” to determine ranges of values supported.

Each has a test command (trailing =?) to give information about the type of its subparameters. The parameters also have a read command (trailing ?) to check the current values of subparameters.

- **Action type commands.** This type of command may be “executed” or “tested”.
 - “executed” to invoke a particular function of the equipment, which generally involves more than the simple storage of a value for later use.
 - “tested” to determine:
 - If subparameters are associated with the action, the ranges of subparameters values that are supported. If the command has no subparameters, issuing the corresponding test command (trailing =?) raises the result code “ERROR”.
 - The response to the test command (trailing =?) may change in the future to allow the description of new values and functions.

Note: Issuing the read command (trailing ?) causes the command to be executed.

- Whether or not the equipment implements the action command (in this case issuing the corresponding test command - trailing =? - returns the OK result code), and, if subparameters are associated with the action, the ranges of subparameters values that are supported.

Action commands do not store the values of any of their possible subparameters.

Moreover:

If all the subparameters of a parameter type command +CMD (or #CMD or \$CMD) are optional, issuing AT+CMD=<CR> (or AT#CMD=<CR> or AT\$CMD=<CR>) causes the OK result code to be returned and the previous values of the omitted subparameters to be retained.

String Type Parameters

A string, enclosed between quotes or not, is a valid string type parameter input. According to V.25ter, space characters are ignored on the command line and may be used freely for formatting purposes, unless they are embedded in numeric or quoted string constants. Therefore, a string containing a space character has to be enclosed between quotes to be considered a valid string type parameter.

A string is always case sensitive.

Some commands require you to always place the input string parameters within quotes. When this is required, the command descriptions explicitly tell you so.

Command Lines

A command line is made up of three elements: the prefix, the body, and the termination character.

The command line prefix consists of the characters "AT" or "at". To repeat the execution of the previous command line, use the characters "A/" or "a/" or AT#/ or at#/.

Using parameter S3, you can select the termination character. **The default is <CR>.**

The structures of the command line are:

- ATCMD1<CR> where AT is the command line prefix, CMD1 is the body of a basic command and <CR> is the command line terminator character.

The name of the command never begins with the character "+"

- ATCMD2=10<CR> where 10 is a subparameter.
- AT+CMD1;+CMD2=,10<CR> these are two extended command examples. They are delimited with semicolon. In the second command, the subparameter is omitted.

The name of the command always begins with the character "+".

- +CMD1?<CR> This is a read command for checking current subparameter values.
- +CMD1=?<CR> This is a test command for checking possible subparameter values.

These commands might be performed in a single command line as shown below:

```
ATCMD1 CMD2=10+CMD1;+CMD2=,10;+CMD1?;+CMD1=?<CR>
```

- Separating basic commands and extended commands into different command lines is recommended.
- Avoid placing several action commands in the same command line. If one command fails, an error message is received. However, it is not possible to determine which command failed the execution.

- If command V1 is enabled (verbose responses codes) and all commands in a command line performed successfully, result code <CR><LF>OK<CR><LF> is sent from the TA to the TE. If subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code <CR><LF>ERROR<CR><LF> is sent and no subsequent commands in the command line are processed.
- If command V0 is enabled (numeric responses codes), and all commands in a command line performed successfully, result code 0<CR> is sent from the TA to the TE. If sub-parameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code 4<CR> and no subsequent commands in the command line are processed.
- In case of errors depending on ME operation, ERROR (or 4) response may be replaced by +CME ERROR: <err> or +CMS ERROR: <err>.

Note: The command line buffer accepts a maximum of 80 characters. If this number is exceeded none of the commands are executed and TA returns ERROR.

Information Responses and Result Codes

For the previous Example, if verbose response format is enabled the terminal adapter (TA) response might appear as:

- Information response to +CMD1?
<CR><LF>+CMD1:2,1,10<CR><LF>
- Information response to +CMD1=?
<CR><LF>+CMD1(0-2),(0,1),(0-15)<CR><LF>
- Final result code
<CR><LF>OK<CR><LF>

Result codes according to ITU-T V.25ter

Two types of result codes include:

- Result codes that inform about progress of TA operation, for example connection establishment CONNECT.
- Result codes that indicate occurrence of an event not directly associated with issuance of a command from TE (for example ring indication RING).

Numeric form	Verbose form
0	OK
1	CONNECT or CONNECT <text> where <text> can be "300", "1200", "2400", "4800", "9600", "14400" or "1200/75"
2	RING
3	NO CARRIER
4	ERROR
6	NO DIALTONE
7	BUSY
8	NO ANSWER

Command Response Timeout

If response codes are enabled, which is the default setting, then every command issued to the module returns a result response.

The time needed to process the given command and return the response varies depending on the command type.

Commands that do not interact with the network, and only involve internal setups or readings, have a quicker response than commands that require network interaction.

The table below lists the commands whose network interaction may lead to long response times. When not otherwise specified, timing is referred to set commands.

For phonebook and SMS writing and reading related commands, timing is referred to commands issued after phonebook sorting completes.

For DTMF sending and dialing commands, timing is referred to the module registered on the network (“AT+CREG?” answer is “+CREG: 0,1” or “+CREG: 0,5”).

Command	Estimated maximum time to get response (Seconds)
+COPS	30 (test command)
+CLCK	25 (SS operation) 5 (FDN enabling/disabling)
+CLAC	5
+CPWD	15 (SS operation) 5 (PIN modification)
+CLIP	15 (read command)
+CLIR	15 (read command)
+CCFC	15
+CCWA	15
+CHLD	30
+CPIN	5
+CPBS	5 (FDN enabling/disabling)
+CPBR	5 (single reading) 15 (complete reading of a 250 records full phonebook)
+CPBF	10 (string present in a 250 records full phonebook) 5 (string not present)
+CPBW	5
+CACM	5
+CAMM	5
+CPUC	5
+VTS	20 (transmission of full “1234567890*#ABCD” string with no delay between tones, default duration)
+CSCA	5 (read and set commands)
+CSAS	5

Command	Estimated maximum time to get response (Seconds)
+CRES	5
+CMGS	60 after CTRL-Z for SMS not concatenated; 1 to get '>' prompt
+CMSS	60 after CTRL-Z; 1 to get '>' prompt
+CMGW	60 after CTRL-Z for SMS not concatenated; 1 to get '>' prompt
+CMGD	5 (single SMS cancellation)
	25 (cancellation of 50 SMS)
+CMGR	5
+CMGL	100
+CGACT	150
+CGATT	10
D	30 (voice call) Timeout set with ATS7 (data call)
A	30 (voice call) Timeout set with ATS7 (data call)
H	30
+CHUP	5
+COPN	10
+CPOL	10 (set command; read command of 84 records)
+CRSM	5
#MBN	10
#TONE	5 (if no duration specified)
#ADC	5
#EMAILD	20
#EMAILACT	150
#SEMAIL	170 (context activation + DNS resolution)
#MSCLASS	15
#SPN	5
#STSR	10
#CCID	5
#GPRS	150
#QDNS	20
#FTPOPEN	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPCLOSE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPTYPE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPDELE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPPWD	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPCWD	500 (timeout set with AT#FTPTO, in case no response is received from server)

Command	Estimated maximum time to get response (Seconds)
#FTPLIST	500 (timeout set with AT#FTPTO, in case no response is received from server) + time to get listing
#FTPFSIZE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPPUT	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPAPP	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPGET	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPGETPKT	500 (timeout set with AT#FTPTO, in case no response is received from server)
#SGACT	150
#SH	3
#SD	140 (DNS resolution + connection timeout set with AT#SCFG)
#CSURV	10 to start data output; 120 seconds to complete scan
#CSURVC	10 to start data output; 120 seconds to complete scan
#CSURVU	10 to start data output; 120 seconds to complete scan
#CSURVUC	10 to start data output; 120 seconds to complete scan
#CSURVB	10 to start data output; 120 seconds to complete scan
#CSURVBC	10 to start data output; 120 seconds to complete scan
#CSURVP	10 to start data output; 120 seconds to complete scan
#CSURVPC	10 to start data output; 120 seconds to complete scan
#LSCRIPT	10 (40 files, 10 KB each)
#REBOOT	5
#RSCRIPT	30 seconds for a 100 KB file 30 seconds timeout and ERROR message if no bytes are received on the serial line
#WSCRIPT	35 seconds for a 100 KB file 30 seconds timeout and ERROR message if no bytes are sent on the serial line and the file has not been completely sent
#DSCRIPT	120

Command Issuing Timing

The chain Command -> Response is always respected. You may not issue a new command until the module finishes sending all of its response result codes.

This applies especially to applications that “sense” the OK text and therefore may send the next command before the complete code <CR><LF>OK<CR><LF> is sent by the module.

It is recommended to wait for at least 20ms between the end of the reception of the response and the issue of the next AT command.

If the response codes are disabled, and as such, the module does not report responses to the command, then the 20ms pause time is respected.

Storing Values Set by Commands Overview

Factory Profile and User Profiles

The wireless module stores the values set by several commands in the internal, non-volatile memory (NVM), allowing this setting to remain even after power off. In the NVM, these values are set either as factory profile or as user profiles.

There are two customizable user profiles and one factory profile in the NVM of the device: By default, the device starts with user profile 0 equal to factory profile.

For backward compatibility, each profile is divided into two sections:

- **base section**, which was historically the one that was saved and restored in early releases of code, and
- **extended section**, which includes all the remaining values.

The &W command is used to save the actual values of both sections of profiles into the non-volatile memory user profile.

Commands &Y and &P are both used to set the profile to be loaded at startup. &Y instructs the device to load only the base section at startup. &P instructs the device to load, at startup, the full profile: base + extended sections.

For commands in the base section, the &F command resets values to factory profile defaults.

&F1 resets to factory profile values the full set of base + extended section commands.

The values set by other commands are stored in non-volatile memory outside the profile. Some values are always stored, without issuing &W. Other values are stored by issuing specific commands (+CSAS, #ESAV). All of these values are read at power-up.

The values set by the following commands are stored in the profile base section. They depend on the specific AT instance.

GSM DATA MODE	+CBST
AUTOBAUD	+IPR
COMMAND ECHO	E
RESULT MESSAGES	Q
VERBOSE MESSAGES	V
EXTENDED MESSAGES	X
FLOW CONTROL OPTIONS	&K, +IFC
DSR (C107) OPTIONS	&S
DTR (C108) OPTIONS	&D
RI (C125) OPTIONS	\R
POWER SAVING	+CFUN
DEFAULT PROFILE	&Y0
S REGISTERS	S0;S2;S3;S4;S5;S7;S12;S25;S30;S38
CHARACTER FORMAT	+ICF

The values set by following commands are stored in the profile extended section. They depend on the specific AT instance (see +CMUX).

+FCLASS	+ILRR	+DR
+CSCS	+CR	+CRLP
+CRC	+CSNS	+CVHU
+CREG	+CLIP	+CLIR
+CCWA	+CUSD	+CAOC
+CSSN	+CIND	+CMER
+CPBS	+CMEE	+CGREG
+CGEREP	+CMGF	+CSDH
+CNMI	#QSS	#ACAL
#TEMPMON	#ACALEXT	#ECAM
#SMOV	#MWI	#NITZ
#SKIPESC	#E2ESC	#STIA
+CSTF	#CESTHLCK	#CFLO
+CTZR	+CSDF	+CTZU
+CCWE	#CFF	+CSIL
#CMEEMODE	#MMSSNH	

- ACAL depends on the CMUX 0 instance only
- #TEMPMON is partially stored in non-volatile memory. See command description for details.

The values set by following commands are stored in the profile extended section and don't depend on the specific AT instance (see +CMUX).

+CALM	+CRSL	+CMUT
+CLVL	+VTD	+CSCB
#STM	#DVI	#E2SMSRI
#SPKMUT	#CODEC	#SHFEC
#SIMDET	#NITZ	#E2SLRI
#SHSEC	#TEMPMON	#PSEL
#SHFNR	#TSVOL	#SHFAGC
#CPUMODE	#PSMRI	#SHSNR

- #TEMPMON is partially stored in non-volatile memory. See command description for details.
- +CMUT, +CLVL, #CAP, #SRS, #SRP, #STM, and #SHFEC depend on the CMUX 0 instance only.
- For +CSBC, storing and restoring are accomplished with +CSAS and +CRES.

The values set by following commands are automatically stored in non-volatile memory, without issuing any storing command and independently from the profile (unique values), and are automatically restored at startup.

+CGDCONT	+COPS	+CGCLASS
#REGMODE	+CGQMIN	+CGQREQ
#DIALMODE	#PLMNMODE	#AUTOBND
#ENS	#BND	#JDR
#ENHSIM	#SCFG	#TXMONMODE
#TTY	#AUTOATT	#GSMCONT
#NWSMANTMR	#ICMP	#DNS
#TCPMAXDAT	#SMSMODE	#SWLEVEL
#CPASMODE	#TCPREASS	+CGSMS
#V24MODE	#FASTCCID	+CPLS

- +COPS is partially stored in non-volatile memory. See command description for details.

The values set by following commands are stored in non-volatile memory on demand, issuing specific commands and independently from the profile:

+CSCA	+CSMP	+CSCB
-------	-------	-------

- Stored by +CSAS command and restored by +CRES command. Note, that both +CSAS and +CRES deal with non-volatile memory and SIM storage.

#VAUX

- Stored by the #VAUSAV command

#USERID	#PASSW	#PKTSZ
#DSTO	#SKTTO	#SKTSET
#SKTCT		

- Stored by #SKTSAV command and automatically restored at startup. #SKTRST restores default values.

#SMTP	#EADDR	#EUSER
#EPASSW		

- Stored by #ESAV command and automatically restored at startup. #ERST restores default values.

#BIQUADIN	#BIQUADINEX	#BIQUADOUT
#BIQUADOUTEX		

- Stored by \$PSAV command and automatically restored at startup. #PRST command restores default values.

Format for Entering AT Commands

This chapter describes the general format you must use when entering AT commands.

Command Line Prefixes

Starting A Command Line **AT**

The prefix AT is a two-character abbreviation for Attention. With one exception—the AT#/ prefix—you always use AT to start a command line that is sending commands from Terminal Equipment (TE) to Terminal Adapter (TA).

Notes

- If you want to learn more about this command, refer to the 3GPP TS 27.007 specification.

Last Command Automatic Repetition **A/**

If the prefix A/ or a/ is issued, the module immediately re-executes the body of the preceding command line. No editing is possible and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired.

If A/ is issued before any command line is executed, the preceding command line is assumed to have been empty (that results in an OK result code).

Notes

- This command works only at fixed IPR.
- The A/ command is similar to the custom prefix AT#/, in that both prefixes cause the last command to be re-executed. However, the prefix AT#/ does not need a fixed IPR.
- If you want to learn more about this command, refer to the V.25ter specification.

Repeat Last Command **AT#/'**

Use this prefix to re-execute the last received command.

Remotely Issuing AT Commands

You can configure Multi-Tech devices to accept AT commands issued remotely via SMS from another cellular device and to send AT command responses to that remote device. To do this, enable SMS AT Run and then use SMS AT Run White List to specify the phone number(s) that the device is allowed to process AT commands from. When you enable this feature, the AT command instance defined by AT#SMSATRUNCFG processes remote AT commands and is not available locally.

Warnings

Do not enable SMS AT Run with AT#SMSATRUNCFG set at the default value. The default AT#SMSATRUNCFG setting configures the SMS ATRN to occur over AT command instance 3. Enabling SMS AT Run with the default setting blocks local applications from communicating over the auxiliary AT command interface.

Certain devices and applications may primarily communicate via the primary modem AT command port and use the secondary AT command port for queries such as signal or registration or for sending SMS. Enabling SMS AT Run in these scenarios adversely affects device operation; the device will not respond to any command sent to the auxiliary AT command port.

If your application or hardware communicates over only one AT command instance and it is the same AT command instance defined by AT#SMSATRUNCFG, enabling AT#SMSATRUN will make the device inoperable. With AT#SMSATRUN enabled, the device can't end additional AT commands, because that one instance would be used only for remote SMS AT Run functions and would be unavailable locally. In this case, the device won't accept remote commands because you can't set up phone numbers in the white list. Phone numbers can't be added to the white list until AT#SMSATRUN is enabled.

Configuring SMS AT Run

Use these steps to configure devices to accept remote AT commands sent via SMS from specific phone numbers.

1. Issue AT#SMSATRUN=1 to the device to enable SMS AT Run functionality.
2. Issue AT#SMSATWL=0,x,0,"#####" to the device to add a phone number to the white list; x represents index values of 1 through 8 and ##### represents the phone number.

Notes

- The device must be located where it has access to a cellular network.
- The device must be registered on the cellular network.
- The device's SIM account must have active SMS functionality, allowing it to send/receive SMS messages.
- The device must be in a functional state to process the remote SMS AT Command and reply to it.

Example

Issue Device Commands:

```
AT#SMSATRUN=1
AT#SMSATWL=0,1,0,"5554443333"
```

Phone number 5554443333 sends an AT Command via SMS message to the device:

```
AT+GMR
```

The device sends an AT Command response via SMS to phone number 5554443333:

12.00.023 OK

Notes

- Some commands don't return SMS responses. For example, AT#REBOOT resets the radio and doesn't send a response.
- AT#SMSATRUN and AT#SMSATWL automatically save to non-volatile memory and are not erased via AT&F or AT&F1 or power cycle.

V.250 AT Commands

Generic Modem Control

Set to Factory-Defined Configuration &F

Execute command sets the configuration parameters to default values specified by the manufacturer. This includes hardware configuration switches and other manufacturer-defined criteria.

Syntax

Command	Command type
AT&F[<value>]	Set

Parameters and Values

<value>	Hardware version, a string of no more than 31 characters.
0	Only the factory profile base section parameters are set to default values.
1	Full factory profile restored, that is, the factory profile base section and the extended section are restored.

Notes

- If parameter <value> is omitted, the command has the same behavior as AT&F0.
- Reference: V.25ter.

Soft Reset Z

Execute this command to the base section of the specified user profile and the extended section of the default factory profile.

Syntax

Command	Command type
ATZ[<n>]	Execute

Parameters and Values

<n>	Hardware version, a string of no more than 31 characters.
0-1	User profile number.

Notes

- Any call in progress is terminated.
- If parameter <n> is omitted, the command has the same behavior as ATZ0.
- Reference: V.25ter.

Select Active Service Class +FCLASS

Set command sets the wireless module in specified connection mode (data, fax, voice). All calls done after you set FCLASS are data or voice.

Read command returns the current value of <n>.

Test command returns all supported values of <n>.

Syntax

Command	Command type
AT+FCLASS=<n>	Set
AT+FCLASS?	Read
AT+FCLASS=?	Test

Parameters and Values

This device supports the following values:

<n>	
0	Data. Default: 0.
1	Fax class 1. Not supported.
8	Voice.

Notes

- Reference: 3GPP TS 27.007

Default Reset Basic Profile Designation &Y

Execute command to define the basic profiles that load on startup.

Syntax

Command	Command type
AT&Y[<n>]	Execute

Parameters and Values

<n>	
0-1	Profile. The wireless module can store 2 complete configurations See &W. Default: 0.

Notes

- Different from command Z<n>, which loads just once the desired profile, the one chosen through command &Y is loaded on every startup.
- If parameter is omitted, the command has the same behavior as AT&Y0.

Default Reset Full Profile Designation &P

Execute command defines which full profile is loaded on startup.

Syntax

Command	Command type
AT&P[<n>]	Execute

Parameters and Values

<n>	
0-1	Profile number. The wireless module can store 2 full configurations. See &W.

Notes

- Different from command Z<n>, which loads just once the desired profile, the one chosen through command &P is loaded on every startup.
- If parameter is omitted, the command has the same behavior as AT&P0.

Store Current Configuration &W

Execute command stores the complete configuration of the device in profile <n>.

Syntax

Command	Command type
AT&W[<n>]	Execute

Parameters and Values

<n>
0-1 Profile.

Notes

- If parameter is omitted, the command behaves the same as AT&W0.

Store Telephone Number &Z

Execute command stores the telephone number <nr> in the record <n>. The records cannot be overwritten. You must clear them before rewriting.

Syntax

Command	Command type
AT&Z<n>=<nr>	Set

Parameters and Values

<n> Phonebook record, 0-9.
<nr> String type, telephone number.

Notes

- The wireless module has built-in, non-volatile memory where you can store 10 telephone numbers, each with a maximum 24 digits.
- To delete the record <n>, issue the command AT&Z<n>=<CR>.
- Use the command &N to view the records in the module memory
- To dial the telephone number stored in the record use the command ATDS=<n>.

Example

Store the number to index 0:

```
AT&Z0=5554443333
```

Display Stored Numbers &N

Execute command returns the telephone number stored at the <n> position in the internal memory

Syntax

Command	Command type
AT&N[<n>]	Execute

Parameters and Values

<n> Phonebook record number.

Notes

- If parameter <n> is omitted then all the internal records are shown.

Manufacturer Identification +GMI

Execute command returns the manufacturer identification.

Syntax

Command	Command type
AT+GMI	Execute

Notes

- Reference: V.25ter.

Model Identification +GMM

Execute command returns the manufacturer's model identification.

Syntax

Command	Command type
AT+GMM	Execute

Notes

- Reference: V.25ter.

Revision Identification +GMR

Execute command returns the manufacturer's software revision identification.

Syntax

Command	Command type
AT+GMR	Execute

Notes

- Reference: V.25ter.

Capabilities List +GCAP

Execute command returns the equipment supported command set list.

Syntax

Command	Command type
AT+GCAP	Execute

Notes

- Reference: V.25ter.
- Response indicates:
 - +CGSM: GSM ETSI command set.
 - +DS: Data Service common modem command set.
 - +MS: Mobile Specific command set.
 - +FCLASS: Fax class. Not supported.

Serial Number +GSN

Execute command returns the cellular radio serial number.

Syntax

Command	Command type
AT+GSN	Execute

Notes

- The number returned is not the IMSI; it is only the board number.
- Reference: V.25ter.

Display Configuration and Profile &V

Execute command returns some of the base configuration parameters settings.

Syntax

Command	Command type
AT&V	Execute

Notes

- The row of information about **CTS (C106) OPTIONS** is in the output of **&V** only for compatibility reasons and represents only a dummy value.

Display Configuration and Profile &V0

Execute command returns configuration parameter settings for the following:

DTE SPEED	EXTENDED MESSAGES	DTR (C108) OPTIONS
DTE FORMAT	LINE SPEED	DCD (C109) OPTIONS
GSM DATA MODE	CONSTANT DTE SPEED	RI (C125) OPTIONS
AUTOBAUD	FLOW CONTROL OPTIONS	C108/1 OPERATION
COMMAND ECHO	CTS (C106) OPTIONS	POWER SAVING ON DTR
RESULT MESSAGES	DSR (C107) OPTIONS	DEFAULT PROFILE
VERBOSE MESSAGES		

Syntax

Command	Command type
AT&V0	Execute

Notes

- This command is the same as &V.
- The row of information about CTS (C106) OPTIONS is in the output of &V0 only for compatibility reasons and represents only a dummy value.

S Registers Display &V1

Use this command to get the value of the S registers in decimal and hexadecimal value in the format:

REG	DEC	HEX
<reg0>	<dec>	<hex>
<reg1>	<dec>	<hex>

Syntax

Command	Command type
AT&V1	Execute

Parameters and Values

<regn>	S register number.
000-005	
007	
012	
025	
038	
<dec>	Current value in decimal notation.
<hex>	Current value in hexadecimal notation.

Extended S Registers Display &V3

Execute command returns the value of the S registers in decimal and hexadecimal value in the format:

REG	DEC	HEX
<reg0>	<dec>	<hex>
<reg1>	<dec>	<hex>

Syntax

Command	Command type
AT&V3	Execute

Parameters and Values

This device supports the only following values:

<regn>	S register number.
000-005	
007	
012	
025	
<dec>	Current value in decimal notation.
<hex>	Current value in hexadecimal notation.

Display Last Connection Statistics &V2

Execute command returns the last connection statistics & connection failure reason.

Syntax

Command	Command type
AT&V2	Execute

Single Line Connect Message \V

Execute command set single line connect message.

Syntax

Command	Command type
AT\V<n>	Execute

Parameters and Values

<n>	
0	Off.
1	On.

Country of Installation +GCI

Set command selects the installation country code.

Read reports the currently selected country code.

Test command reports the supported country codes.

Syntax

Command	Command type
AT+GCI=<code>	Set
AT+GCI?	Read
AT+GCI=?	Test

Parameters and Values

<code>

59

Italy

Master Reset +CMAR

Set command requests that the mobile terminal reset user data. User data resets to default values.

Test command tests for command existence.

Syntax

Command	Command type
AT+CMAR=<code>	Set
AT+CMAR=?	Test

Parameters and Values

<phone lock code>

String type representing 8-digit security code. Must be verified before master reset.

Note

- This command formats the non-volatile memory. After formatting, the module reboots automatically.
- So formatting is not interrupted, issue AT+CFUN=4 before starting to format the non-volatile memory.

DTE Modem Interface Control

Command Echo E

Set command enables or disables the command echo.

Syntax

Command	Command type
ATE[<n>]	Set

Parameters and Values

<n>

0

Disables command echo.

1

Enables command echo, hence commands sent to the device are echoed back to the DTE before the response is given. **Default: 1.**

Notes

- If parameter is omitted, the command has the same behavior as ATE0.
- Reference: V.25ter.

Quiet Result Codes Q

Set command enables or disables the result codes.

Syntax

Command	Command type
ATQ[<n>]	Set

Parameters and Values

<n>

0

Enables result codes. **Default: 0.**

1

Disables result codes.

2

Disables result codes. Only for backward compatibility.

Notes

- After issuing either ATQ1 or ATQ2 every information text transmitted in response to commands is not affected.
- If parameter is omitted, the command has the same behavior as ATQ0.

Example

After issuing ATQ1 or ATQ2

```
AT+CREG?
```

```
+CREG: 0, 1
```

Response Format V

Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form. For more information about the result codes, refer to “Information Responses and Result Codes.”

Syntax

Command	Command type
ATV[<n>]	Set

Parameters and Values

<n>

0	Limited headers and trailers and numeric format of result codes
	information responses <text><CR><LF> result codes <numeric code><CR>
1	Full headers and trailers and verbose format of result codes. Default: 1.
	information responses <CR><LF> <text><CR><LF>
	result codes <CR><LF> <verbose code><CR><LF>

Notes

- The <text> portion of information responses is not affected by this setting.
- If parameter is omitted, the command has the same behavior as ATV0.
- Reference: V.25ter.

Extended Result Codes X

Set command selects the result code messages subset that the modem uses to inform the DTE of command results.

Syntax

Command	Command type
ATX[<n>]	Set

Parameters and Values

<n>

0	On entering dial-mode CONNECT result code is given; OK, CONNECT, RING, NO CARRIER, ERROR, NO ANSWER result codes are enabled . Dial tone and busy detection (NO DIALTONE and BUSY result codes) are disabled.
1-4	On entering dial-mode CONNECT <text> result code is given; all the other result codes are enabled. Default: 1.

Notes

- If parameter is omitted, the command has the same behavior as ATX0.
- For complete control on CONNECT response message see +DR command.
- Reference: V.25ter.

Identification Information I

Execute command returns one or more lines of information text followed by a result code.

Syntax

Command	Command type
ATI[<n>]	Execute

Parameters and Values

<n>

0	Numerical identifier.
1	Module checksum.
2	Checksum check result.
3	Manufacturer (Telit).
4	Manufacturer's Product name (GE910-QUAD).
5	DOB version.

Notes

- If parameter is omitted, the command has the same behavior as ATIO.
- Reference: V.25ter.

Data Carrier Detect (DCD) Control &C

Set command controls the RS232 DCD output behavior.

Syntax

Command	Command type
AT&C[<n>]	Set

Parameters and Values

<n>

0	DCD remains high always.
1	DCD follows the carrier detect status: if carrier is detected DCD is high, otherwise DCD is low. Default: 1.
2	DCD off while disconnecting.

Notes

- If parameter is omitted, the command has the same behavior as AT&C0.
- Reference: V.25ter.

Data Terminal Ready (DTR) Control &D

Set command controls the module behavior to the RS232 DTR transitions.

Syntax

Command	Command type
AT&D[<n>]	Set

Parameters and Values

<n>

- | | |
|---|--|
| 0 | Device ignores DTR transitions. Default: 0. |
| 1 | DCD follows the carrier detect status: if carrier is detected DCD is high, otherwise DCD is low. |
| 2 | When the module is connected, the high to low transition of DTR pin sets the device in command mode; the current connection is not closed. |
| 3 | Device ignores DTR transitions. |
| 4 | C108/1 operation is disabled. Of +CVHU is not 2, issuing AT&D3 is equivalent to AT&D5. |
| 5 | C108/1 operation is enabled. Same behavior as for <n>=2. |

Notes

- If +CVHU is not set at 2, issuing AT&D0, AT&D1, AT&D2, AT&D3, or AT&D4 is equivalent to AT&D5.
- If a connection is set up issuing #SKTD, then AT&D1 has the same effect as AT&D2. If a connection is set up issuing AT#SD then AT&D1 and AT&D2 have different effect, as described above.
- If AT&D2 is issued and the DTR is tied Low, auto answering is inhibited and it is possible to answer only issuing command ATA.
- If parameter is omitted, the command has the same behavior as AT&D0.
- Reference: V.25ter.

Standard Flow Control \Q

Set command controls the RS232 DSR flow control behavior.

Syntax

Command	Command type
AT\Q<n>	Set

Parameters and Values

This device supports the following values:

<n>

- | | |
|---|---|
| 0 | No flow control. |
| 1 | Software bi-directional with filtering (XON/XOFF) |
| 2 | Hardware mono-directional flow control (only CTS active) |
| 3 | Hardware bi-directional flow control (both RTS/CTS active). Default: 3 |

Notes

- Hardware flow control (AT\Q3) is not active in command mode.
- \Q settings are functionally a subset of &K settings
- If parameter is omitted, the command has the same behavior as AT\Q0.
- Reference: V.25ter.

Flow Control &K

Set command controls the RS232 flow control behavior.

Syntax

Command	Command type
AT&K<n>	Set

Parameters and Values

This device supports the following values:

<n>	
0	No flow control.
1	Hardware mono-directional flow control (only CTS active)
2	Software mono-directional flow control (XON/XOFF)
3	Hardware bi-directional flow control (both RTS/CTS active). Default: 3
4	Software bi-directional with filtering (XON/XOFF)
5	Pass through, software bi-directional without filtering (XON/XOFF)
6	Hardware bi-directional flow control (both RTS/CTS active) and software.

Notes

- &K has no read command. To verify current setting, use AT&V to check the active profile settings.
- Hardware flow control (AT&K3) is not active in command mode.
- If parameter is omitted, the command has the same behavior as AT\K0.

Data Set Ready (DSR) Control &S

Set command controls the RS232 DSR pin behavior.

Syntax

Command	Command type
AT&S<n>	Set

Parameters and Values

<n>	
0	Always high.
1	Follows the data traffic channel indication.
2	High when connected.
3	High when device is ready to receive commands. Default: 3

Notes

- If option 1 is selected then DSR is tied high when the device receives from the network the data traffic channel indication.
- In power saving mode the DSR pin is always tied low.
- If parameter is omitted, the command has the same behavior as AT&S0.
- If options 1 or 2 are active, DSR will not be tied high in case of voice channel.

Ring (RI) Control \R

Set command controls the RING output pin behavior.

Syntax

Command	Command type
AT\R[<n>]	Set

Parameters and Values

<n>

- | | |
|---|--|
| 0 | RING on during ringing and further connection. |
| 1 | RING on during ringing. Default: 1. |
| 2 | RING follows the ring signal. |

Notes

- To check the ring option status use the &V command.
- If parameter is omitted, the command has the same behavior as AT\R0.

Fixed DTE Interface Rate +IPR

Set command specifies the DTE speed at which the device accepts commands during command mode operations; it may be used to fix the DTE-DCE interface speed.

Read command returns the current value of +IPR parameter.

Test command returns the list of supported fixed rate values in the format:

+IPR: (list of fixed-only <rate> values)

Syntax

Command	Command type
AT+IPR=<rate>	Set
AT+IPR?	Read
AT+IPR=?	Test

Parameters and Values

<rate>

- | | |
|--------|-------------------------|
| 300 | |
| 1200 | |
| 2400 | |
| 4800 | |
| 9600 | |
| 19200 | |
| 38400 | |
| 57600 | |
| 115200 | Default: 115200. |
| 230400 | |
| 460800 | |
| 921600 | |

Notes

- DTE speed of USB port is always 0. USB DTE speed does not change.
- If <rate> is specified and not 0, DTE-DCE speed is fixed at that speed.
- Rate can be higher than 115200. Maximum value depends on specific product. Check this value with AT+IPR=?.
- Reference: V.25ter.

DTE – Modem Local Flow Control +IFC

Set command selects the serial port flow control behavior in both directions, from DTE to modem (<by_ta> option) and from modem to DTE (<by_te>).

Read command returns active flow control settings.

Test command returns all supported values of the parameters <by_te> and <by_ta>.

Syntax

Command	Command type
AT+IFC<by_te>,<by_ta>	Set
AT+IFC?	Read
AT+IFC=?	Text

Parameters and Values

This device supports the following values:

<by_te>	Flow control option for the data sent by DTE
0	No flow control.
1	XON/XOFF filtered. Not supported.
2	C105 (RTS) Default: 2.
3	XON/XOFF not filtered. Not supported.
<by_ta>	Flow control option for the data sent by modem
0	No flow control.
2	C106 (CTS) Default: 2.

Notes

- Hardware flow control (AT+IFC=2,2) is not active in command mode.
- This command is equivalent to &K.
- If flow control behavior has been set with AT&Kn with a parameter that is not allowed by AT+IFC, the read command AT+IFC will return: +IFC: 0,0.
- Software flow control (XON/XOFF) is not supported.
- Reference: V.25ter.

DTE – Modem Local Rate Reporting +ILRR

Set command controls whether or not the +ILRR: <rate> information text is transmitted from the modem (module) to the DTE.

Read command returns active parameter <n> setting.

Test command returns all supported values of the parameter <n>.

Syntax

Command	Command type
AT+ ILRR=<n>	Set
AT+ILRR?	Read
AT+ILRR=?	Text

Parameters and Values

<n>

- 0** Local port speed rate reporting disabled. **Default: 0.**
- 1** Local port speed rate reporting enabled.

Notes

- If enabled, this information is sent upon connection.
- Reference: V.25ter.

DTE – Modem Character Framing +ICF

Set command defines the asynchronous character framing used.

Read command returns current settings for <format> and <parity>. If the <format> setting is neither 2 nor 5, the current <parity> setting is 0.

Test command returns value ranges for parameters.

Syntax

Command	Command type
AT+ICF=[<format>[,<parity>]]	Set
AT+ICF?	Read
AT+ICF=?	Text

Parameters and Values

This device supports the following values:

- <format>** Determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.
 - 1** 8 Data, 2 Stop.
 - 2** 8 Data, 1 Parity, 1 Stop.
 - 3** 8 Data, 1 Stop **Default: 3.**
 - 5** 7 Data, 1 Parity, 1 Stop.
- <parity>** Determines how the parity bit is generated and checked. If present, this parameter is mandatory and has meaning only if <format> is either 2 or 5.
 - 0** Odd. **Default: 0.**
 - 1** Even.

Notes

- Reference: V.25ter.

Example

```
8N2
AT+ICF = 1
OK
8O1
AT+ICF = 2,0
OK
8E1
AT+ICF = 2,1
OK
8N1
AT+ICF = 3
OK
7O1
AT+ICF = 5,0
OK
7E1
AT+ICF = 5,1
OK
```

Call Control

Dial D

Execute command starts a call to the phone number given as parameter.

If “;” is present, a voice call to the given number is performed, regardless of the current value of the connection mode set by +FCLASS command.

Syntax

Command	Description
ATD<number>[;]	<number> Phone number to be dialed. Notes: Call type (data, fax, or voice) depends on the last +FCLASS setting. Accepted values are 0-9 and *, #, A, B, C, D, +.
ATD><str>[;]	Issues a call to phone number which corresponding alphanumeric field is <str>; all available memories are searched for the correct entry. If “;” is present a voice call is performed. <str> - alphanumeric field corresponding to phone number; it must be enclosed in quotation marks. Parameter <str> is case sensitive. Note: Used character set is the one selected with +CSCS.
ATD><mem><n>[;]	Issues a call to phone number in phonebook memory storage

Command	Description
	<p><mem>, entry <n> (available memories may be queried with AT+CPBS=?). If “;” is present a voice call is performed.</p> <p><mem> - phonebook memory storage.</p> <p>SM - SIM phonebook.</p> <p>FD - SIM fixed dialing-phonebook.</p> <p>LD - SIM last dialing-phonebook.</p> <p>MC - device missed (unanswered received) calls list.</p> <p>RC - ME received calls list.</p> <p>MB - mailbox numbers stored on SIM, if this service is provided by the SIM. See #MBN.</p> <p><n> - entry location; it should be in the range of locations available in memory used.</p>
ATD<n>[;]	<p>Issues a call to phone number in entry location <n> of the active phonebook memory storage. See +CPBS.</p> <p>If “;” is present a voice call is performed.</p> <p><n> - active phonebook memory storage entry location; it should be in the range of locations available in the active phonebook memory storage.</p>
ATDL	Issues a call to the last number dialed.
ATDS=<nr>[;]	<p>Issues a call to the number stored in the module internal phonebook position number <nr>.</p> <p>If “;” is present a voice call is performed.</p> <p><nr> - internal phonebook position to be called. See commands &N and &Z.</p>
ATD<number>I[;] ATD<number>i[;]	<p>Issues a call overwriting the CLIR supplementary service subscription default value for this call</p> <p>If “;” is present a VOICE call is performed.</p> <p>I - invocation, restrict CLI presentation</p> <p>i - suppression, allow CLI presentation</p>
ATD<number>G[;] ATD<number>g[;]	<p>Issues a call checking the CUG supplementary service information for the current call. Refer to +CCUG command.</p> <p>If “;” is present a VOICE call is performed.</p>
ATD*<gprs_sc> [*<addr>][*<L2P>] [*<cid>]]#	<p>This command is GPRS specific and causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN.</p> <p>Parameters:</p> <p><gprs_sc> - GPRS Service Code, a digit string (value 99) that identifies a request to use GPRS</p> <p><addr> - string that identifies the called party in the address space applicable to the PDP.</p> <p><L2P> - a string that indicates the layer 2 protocol to be used (see +CGDATA command). For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used:</p> <p>1 - PPP</p> <p><cid> - a digit that specifies a particular PDP context definition. See +CGDCONT command.</p>

Note

- Reference: V.25ter.

Example

To dial a number in SIM phonebook entry 6:

```
ATD>SM6 ;
```

OK

To have a voice call to the sixth entry of active phonebook:

```
ATD>6 ;
```

OK

To call the entry with alphanumeric field "Name":

```
ATD>"Name " ;
```

Return to on-line mode **O**

Execute command answers returns to on-line mode from command mode. If there is no active connection, it returns NO CARRIER.

Syntax

Command	Command type
ATO	Execute

Notes

- After issuing this command, if the device is in conversation, to send other commands to the device, you must use the escape sequence to return to command mode. See register S2 or tying low DTR pin if &D1 option is active.
- Reference: V.25ter.

Answer **A**

Execute command answers an incoming call if automatic answer is disabled.

Syntax

Command	Command type
ATA	Execute

Parameters and Values

<n>

- | | |
|----------|--|
| 0 | RING on during ringing and further connection. |
| 1 | RING on during ringing. Default: 1. |
| 2 | RING follows the ring signal. |

Notes

- This command must be the last in the command line and must be followed immediately by a <CR> character.
- If this command is issued on a non-voice device, the device does not answer the call. Answering voice calls on data devices is restricted.
- Reference: V.25ter.

Disconnect H

Execute command closes the current conversation (voice or data).

Syntax

Command	Command type
ATH	Execute

Notes

- This command can be issued only in command mode; when a data conversation is active the device is in on-line mode (commands are not sensed and characters are sent to the other party), hence escape sequence is required before issuing this command, otherwise if &D1 option is active, DTR pin has to be tied Low to return in command mode.
- Reference: V.25ter.

Compression Control

Data Compression Reporting +DR

Set command enables or disables the data compression reporting upon connection.

Read command returns current value of <n>.

Test command returns all supported values of the parameter <n>.

Syntax

Command	Command type
AT+DR=<n>	Set
AT+DR?	Read
AT+DR=?	Test

Parameters and Values

<n>

- | | |
|---|---|
| 0 | Data compression reporting disabled. Default: 0. |
| 1 | Data compression reporting enabled upon connection.
If enabled, the following intermediate result code is transmitted before the final result code: +DR: <compression> The only supported value for <compression> is "NONE". |

Notes

- Reference: V.25ter

Example

AT+DR?

+DR: 0

OK

AT+DR=?

+DR: (0,1)

OK

S Parameters

Basic commands that begin with the letter S are known as S-Parameters. The number following the S is the parameter number being referenced. If the number is not recognized as a valid parameter number, an ERROR result code is issued.

If no value is given for the subparameter of an S-Parameter, an ERROR result code is issued and the stored value left unchanged.

Notes

- Reference: V.25ter.

Number of Rings to Auto Answer S0

Set command sets the number of rings required before device automatically answers an incoming call.

Read command returns the current value of S0 parameter.

Syntax

Command	Command type
ATS0=<n>	Set
ATS0?	Read

Parameters and Values

<n>	Number of rings.
0	Auto answer disabled. Default: 0.
1-255	Number of rings required before automatic answer.

Notes

- Does not apply to non-voice models when receiving an inbound voice call.
- Reference: V.25ter.

Ring Counter S1

S1 is incremented each time the device detects the ring signal of an incoming call. S1 is cleared as soon as no ring occurs.

Read command returns the value of this parameter.

Syntax

Command	Command type
ATS1	
ATS1?	Read

Notes

- The form ATS1 has no effect.

Escape Character S2

Set command sets the ASCII character to be used as escape character.

Read command returns the current value of S2 parameter. The format of the numbers in output is always three digits, left-filled with 0s.

Syntax

Command	Command type
ATS2=[<char>]	Set
ATS2?	Read

Parameters and Values

<char>	Escape character (decimal ASCII).
0-255	Default: 43 (+).

Notes

- The escape sequence consists of three escape characters preceded and followed by n ms of idle (see S12 to set n).
- Reference: V.25ter

Command Line Termination Character S3

Set command sets the value of the character either recognized by the device as command line terminator or generated by the device as part of the header, trailer, and terminator for result codes and information text, along with S4 parameter.

Read command returns the current value of S3 parameter. The format of the numbers in output is always three digits, left-filled with 0s.

Syntax

Command	Command type
ATS3=[<char>]	Set
ATS3?	Read

Parameters and Values

<char>	Command line termination character (decimal ASCII).
0-127	Default: 13 (ASCII <CR>).
	Note: The previous S3 value determines the command line termination character for entering the command line containing the S3 setting command. However, the result code issued uses the new S3 value, set during the command line processing.

Notes

- Reference: V.25ter

Response Formatting Character S4

Set command sets the value of the character generated by the device as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter.

Read command returns the current value of S4 parameter. The format of the numbers in output is always three digits, left-filled with 0s.

Syntax

Command	Command type
ATS4=[<char>]	Set
ATS4?	Read

Parameters and Values

<char>	Response formatting character (decimal ASCII).
0-127	Default: 10 (ASCII LF).

Notes

- If the value of S4 is changed in a command line, the result code issued in response of that command line uses the new value of S4.
- Reference: V.25ter.

Command Line Editing Character S5

Set command sets the value of the character recognized by the device as a request to delete from the command line the immediately preceding character.

Read command returns the current value of S5 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS5=[<char>]	Set
ATS5?	Read

Parameters and Values

<char>	Command line editing character (decimal ASCII).
0-127	Default: 8. (ASCII BS).

Notes

- Reference: V.25ter.

Connection Completion Timeout S7

Set command sets the amount of time, in seconds, that the device allows between either answering a call (automatically or by A command) or completion of signaling of call addressing information to network (dialing), and establishment of a connection with the remote device.

Read command returns the current value of S7 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS7=[<tout>]	Set
ATS7?	Read

Parameters and Values

<tout>	Number of seconds.
1-255	Default: 60.

Notes

- Reference: V.25ter.

Escape Prompt Delay S12

Set command sets:

- The minimum period, before the first of the three escape characters is received, during which no other character has to be detected in order to accept it as a valid first character;
- The maximum period allowed between receipt of first or second character of the three escape character sequence and receipt of the next;
- The minimum period, after receipt of the last character of the three-escape character sequence, during which no other character has to be detected in order to accept the escape sequence as a valid one.

Read command returns the current value of S12 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS12=[<char>]	Set
ATS12?	Read

Parameters and Values

<time>	Expressed in fiftieth of a second.
20-255	Default: 50.

Notes

- The minimum period **S12** has to pass after **CONNECT** result code too, before a received character is accepted as valid first character of the three escape character sequence.
- Reference: V.25ter.

Delay to DTR Off S25

Set command defines the amount of time, in hundredths of second, that the device ignores the DTR for taking the action specified by command &D.

Read command returns the current value of S25 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS25=<time>]	Set
ATS25?	Read

Parameters and Values

<time>	Expressed in hundredths of a second.
0-255	Default: 5. Note: The delay is effective only if its value is greater than 5.

Disconnect Inactivity Timer S30

Set command defines the inactivity time-out in minutes. The device disconnects if no characters are exchanged for a period of at least <tout> minutes.

Read command returns the current value of S30 parameter. The format of the numbers in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS30=<tout>]	Set
ATS30?	Read

Parameters and Values

<tout>	Expressed in hundredths of a second.
0	Disabled, disconnection due to inactivity is disabled. Default: 0.
1-127	Inactivity time-out value.

Delay Before Forced Hang Up S38

Set command sets the delay, in seconds, between the device's receipt of H command (or ON-to-OFF transition of DTR) and the disconnect operation.

Read command returns the current value of S38 parameter. The number format in output is always 3 digits, left-filled with 0s.

Syntax

Command	Command type
ATS38=[<delay>]	Set
ATS38?	Read

Parameters and Values

<delay>	In seconds.
0-254	Before disconnecting, the device waits <delay> seconds for the remote device to acknowledge all data in the device buffer. Default: 0.
255	Device doesn't time-out and continues to deliver data in the buffer until the connection is lost or the data is delivered.

Notes

- Use <delay> to ensure that data in device buffer is sent before device disconnects.

3GPP TS 27.007 AT Commands

General

Request Manufacturer Identification +CGMI

Execute command returns the device manufacturer's identification code without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGMI	Execute
AT+CGMI=?	Test

Notes

- Reference: 3GPP TS 27.007.

Request Model Identification +CGMM

Execute command returns the device manufacturer's model identification code without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGMM	Execute
AT+CGMM=?	Test

Notes

- Reference: 3GPP TS 27.007.

Request Revision Identification +CGMR

Execute command returns radio firmware revision number without command echo. Note that some products have additional firmware.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGMR	Execute
AT+CGMR=?	Test

Notes

- Reference: 3GPP TS 27.007.

Request Product Serial Number Identification +CGSN

Execute command returns the modem's serial number (IMEI) without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CGSN	Execute
AT+CGSN=?	Test

Notes

- Reference: 3GPP TS 27.007.

Select TE Character Set +CSCS

Set command sets the current character set used by the device.

Read command returns the current value of the active character set.

Test command returns the supported values for parameter <chset>.

Syntax

Command	Command type
AT+CSCS=[<chset>]	Set
AT+CSCS?	Read
AT+CSCS=?	Test

Parameters and Values

<chset>	Character set.
GSM	GSM default alphabet (3GPP TS 23.038)
IRA	International reference alphabet (ITU-T T.50). Default: IRA.
8859-1	ISO 8859 Latin 1 character set.
PCCP437	PC character set code page 437.
UCS2	16-bit universal multiple-octet coded character set (ISO-IEC10646).

Notes

- Reference: 3GPP TS 27.007.

International Mobile Subscriber Identity (IMSI) +CIMI

Execute command returns the Internal Mobile Subscriber Identity (IMSI) stored in the SIM without command echo.

Test command returns OK result code.

Syntax

Command	Command type
AT+CIMI	Execute
AT+CIMI=?	Test

Notes

- If a SIM card is not in the SIM card housing, the command returns an ERROR.
- Reference: 3GPP TS 27.007.

Multiplexing Mode +CMUX

Set command enables or disables the 3GPP TS 07.010 multiplexing protocol control channel.

Read command returns the current values of parameters, in the format:

+CMUX: <mode>,<subset>

Test command returns the range of supported values for <mode>, <subset>, and <N1>.

Syntax

Command	Command type
AT+CMUX=<mode>[,<subset>][,<port_speed>[,<N1>]]	Set
AT+CMUX?	Read
AT+CMUX=?	Test

Parameters and Values

<mode>	Multiplexer transparency mechanism.
0	Basic option. Currently the only supported value.
<subset >	
0	Only UIH frames used. Currently the only supported value.
<port_speed >	
2	19200 bps
3	38400 bps
4	57600 bps
5	115200 bps
<N1 >	Maximum frame size, indicates the maximum length of the CMUX frame information field (point 5.7.2 of 3GPP TS 07.10). Note: <N1> is not supported by all devices, use the test command to verify if it is supported.
1 to MaxFrameSize	Maximum frame size is fixed: N1=127.

Notes

- Entering the multiplexed mode starts an inactive five-second timer. If no CMUX control channel is established before this inactivity timer expires, the engine returns to AT Command mode.
- The largest CMUX frame, including start and end flag, is 133 bytes long. To set N1 greater than 127, use AT#CPUMODE=3.
- Speed must be set with AT+IPR=<rate> before sending AT+CMUX or using <port_speed>. If using <port_speed>, speed changes after the OK response to AT+CMUX. At the end of the CMUX session, the IPR preserves the value set with <port_speed>.
- All the CMUX protocol parameters are fixed as defined in GSM07.10 and cannot be changed.
- Reference: 3GPP TS 27.007, 3GPP TS 27.010.

Select Preferred MT Power Class +CPWC

Set command selects the preferred mobile terminal power class for each GSM frequency band supported.

Read command returns the current output power class and default output power class for each supported frequency band, in the format:

+CPWC: <curr_class1>,<def_class1>,<band1>[,<curr_class2>,<def_class2>,<band2>[...]]

<band1> and associated power class parameters refer to the currently used frequency band.

Test command returns support bands and their power classes, in the format:

+CPWC: list of supported (<band> , (list of <class>s)) pairs

Syntax

Command	Command type
AT+CPWC=[<class>[,<band>]]	Set
AT+CPWC?	Read
AT+CPWC=?	Test

Parameters and Values

<class>	Numeric parameter, which indicates the power class preference to be used.
0	Default power class for the relevant band.
1, 2	Allowable power classes on DCS1800 and PCS1900 band. Default: 1.
4, 5	Allowable power classes on GSM900 and GSM850 bands. Default: 4.
<band>	Numeric parameter that indicates the frequency band applied to the power class setting.
0	GSM900 and GSM850
1	DCS1800
2	PCS1900

Use this command to reduce nominal maximum output power:

Power Class	Nominal Maximum Output Power
GSM900 and GSM850	
4 (Default)	2 W (33 dBm)
5	0,8 W (29 dBm)
DCS1800	
1 (Default)	1 W (30 dBm)
2	0,25 W (24 dBm)
PCS1900	
1 (Default)	1 W (30 dBm)
2	0,25 W (24 dBm)

Notes

- Use this command to reduce power consumption when the received signal is high (about -70 dBm) and the module is working in static conditions.
- If <class> is given, but <band> is not, the power class setting is applied to GSM900 and GSM850 bands.
- The setting is saved in non-volatile memory and available after reboot.
- Reference: 3GPP TS 27.007.

Call Control

Hang Up Call +CHUP

Execute command cancels all active and held calls, as well as multi-party sessions, if running.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CHUP	Execute
AT+CHUP=?	Test

Notes

- Reference: 3GPP TS 27.007.

Select Bearer Service Type +CBST

Set command sets the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls originate. This setting is also used during mobile terminated data call setup, in case of single numbering scheme calls. See +CSNS.

Read command returns current value of the parameters <speed>, <name> and <ce>.

Test command returns the supported range of values for the parameters.

Syntax

Command	Command type
AT+CBST=[<speed>[,<name>[,<ce>]]]	Set
AT+CBST?	Read
AT+CBST=?	Test

Parameters and Values

<speed>	Data rate.
0	Autobauding. Automatic selection of the speed. Default: 0.
1	300 bps (V.21)
2	1200 bps (V.22)
3	1200/75 bps (V.23)
4	2400 bps (V.22bis).
6	4800 bps (V.32).
7	9600 bps (V.32).

14	14400 bps (V.34).
65	300 bps (V.110)
66	1200 bps (V.110)
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 (V110 or X.31 flag stuffing).
<name>	Bearer service name.
0	Data circuit asynchronous. Default: 0.
<ce>	Connection element.
0	Transparent.
1	Non-transparent. Default: 1.

Notes

- The following settings are not supported:
 - AT+CBST=0,0,0
 - AT+CBST=14,0,0
 - AT+CBST=75,0,0
- The following settings are recommended
 - AT+CBST=71,0,1 for mobile-to-mobile calls
 - AT+CBST=7,0,1 for mobile-to-fix calls
- Reference: 3GPP TS 27.007.

Radio Link Protocol +CRLP

Set command sets Radio Link Protocol (RLP) parameters used when non-transparent data calls originate.

Read command returns the current value of the RLP protocol parameters.

Test command returns supported range of values of the RLP protocol parameters.

Syntax

Command	Command type
AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>]]]]]	Set
AT+CRLP?	Read
AT+CRLP=?	Test

Parameters and Values

<iws>	IWF window dimension.
1-61	Default: 61.
<mws>	MS window dimension.
1-61	Default: 61.
<T1>	Acknowledge timer (10 ms units).
39-255	Default: 78.
<N2>	Retransmission attempts.
1-255	Default: 6.
<ver>	Protocol version.
0	

Notes

- Reference: 3GPP TS 27.007.

Service Reporting Control +CR

Set command controls whether the intermediate result code +CR is returned from TA to TE.

Read command returns whether the intermediate result code +CR is enabled, in the format:

+CR: <mode>

Test command returns the supported range of values of parameter <mode>.

Syntax

Command	Command type
AT+CR=[<mode>]	Set
AT+CR?	Read
AT+CR=?	Test

Parameters and Values

<mode>

- 0** Disables +CR reporting. **Default: 0.**
- 1** Enables +CR reporting. The intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service are used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted. Format is:

+CR: <serv>

where:

<serv>

ASYNC - asynchronous transparent

SYNC - synchronous transparent

REL ASYNC - asynchronous non-transparent

REL SYNC - synchronous non-transparent.

Note: This command replaces V.25ter [14] command Modulation Reporting Control (+MR), which is not appropriate for use with a GSM terminal.

Notes

- Reference: 3GPP TS 27.007.

Extended Error Report +CEER

Execute command returns one or more lines of information text <report> offering the TA user an extended error report, in the format:

+CEER: <report>

This report regards some error condition that may occur:

- The failure in the last unsuccessful call setup, originating or answering.

- The last call release.

Note: If none of the previous conditions has occurred since power up then “Normal, unspecified” condition is reported.

Test command returns OK result code.

Syntax

Command	Command type
AT+CEER	Execute
AT+CEER=?	Test

Notes

- Reference: 3GPP TS 27.007, GSM 04.08.

Cellular Result Codes +CRC

Set command controls whether the extended format of incoming call indication is used.

Read command returns current value of the parameter <mode>.

Test command returns supported values of the parameter <mode>.

Syntax

Command	Command type
AT+CRC=[<mode>]	Set
AT+CRC?	Read
AT+CRC=?	Test

Parameters and Values

<mode>

- 0** Disables extended format reporting. **Default: 0.**
- 1** Enables extended format reporting:
When enabled, an incoming call is indicated to the TE with unsolicited result code

+CRING: <type>
instead of the normal RING.

where:

<type> - call type:

ASYNC – asynchronous transparent data

SYNC - synchronous transparent data

REL ASYNC - asynchronous non-transparent data

REL SYNC - synchronous non-transparent data

FAX - facsimile (TS 62)

VOICE - normal voice (TS 11)

Notes

- Reference: 3GPP TS 27.007.

Single Numbering Scheme +CSNS

Set command selects the bearer to be used when no bearer capability information is provided within a mobile terminated call. The command has to be set before the call comes. Parameter values set with +CBST when <mode> equals a data service.

Read command returns current value of the parameter <mode>.

Test command returns supported values of the parameter <mode>.

Syntax

Command	Command type
AT+CSNS=[<mode>]	Set
AT+CSNS?	Read
AT+CSNS=?	Test

Parameters and Values

<mode>

0	Voice. Default: 0.
2	Not supported.
4	Data.

Notes

- If +CBST parameter is set to a value not applicable to single numbering calls, ME/TA map the value to the closest valid one. For example, if <speed>=71, <name>=0, and <ce>=1 (non-transparent asynchronous 9600 bps V.110 ISDN connection) for mobile originated calls, ME/TW map the values into non-transparent asynchronous 9600 bps V.32 modem connection when single numbering scheme call is answered.
- Reference: 3GPP TS 27.007.

Voice Hang Up Control +CVHU

Set command selects whether ATH or "drop DTR" causes a voice connection to be disconnected.

Read command reports the current value of the <mode> parameter, in the format:

+CVHU: <mode>

Test command reports the range of supported values for parameter <mode>.

Syntax

Command	Command type
AT+CVHU=[<mode>]	Set
AT+CVHU?	Read
AT+CVHU=?	Test

Parameters and Values

<mode>

- 0** Drop DTR ignored but OK result code given. ATH disconnects.
- 1** Drop DTR and ATH ignored but OK result code given.
- 2** Drop DTR behavior according to &D setting. ATH disconnects. **Default: 2.**

Network Service Handling

Subscriber Number +CNUM

If ENS has **not** been enabled (see #ENS), Execute command returns the MSISDN—if the phone number of the device is stored in the SIM card—in the format:

+CNUM: <alpha>,<number>,<type>

If ENS has been enabled (see #ENS), Execute command returns the MSISDN—if the phone number of the device is stored in the SIM card—in the format:

+CNUM: <alpha>,<number>,<type>[<CR><LF>

+CNUM: <alpha>,<number>,<type>[...]]

where:

- <alpha>** Alphanumeric string associated to <number>; Character set used is the one selected with +CSCS.
- <number>** String containing the phone number in the format <type>.
- <type>** Type of number
 - 129** National numbering scheme.
 - 145** International numbering scheme. Contains the character "+".

Test command returns the OK result code

Syntax

Command	Command type
AT+CNUM	Execute
AT+CNUM=?	Test

Notes

- Reference: 3GPP TS 27.007

Read Operator Names +COPN

Execute command returns the list of operator names from the ME in the format:

+COPN: <numeric1>,<alpha1>[<CR><LF>

+COPN: <numeric2>,<alpha2>[...]]

where:

- <numericn>** String type, operator in numeric format.
- <alphan>** String type, operator in long alphanumeric format.

Note: Each operator code <numeric> that has an alphanumeric equivalent <alpha> in the ME memory is returned.

Test command returns the OK result code.

Syntax

Command	Command type
AT+COPN	Execute
AT+COPN=?	Test

Notes

- Reference: 3GPP TS 27.007

Network Registration Report +CREG

Set command enables or disables network registration reports depending on the parameter <mode>.

Read command reports the <mode> and <stat> parameter values in the format:

+CREG: <mode>,<stat>[,<Lac>,<Ci>]

Note: <Lac> and <Ci> are reported only if <mode>=2 and the mobile is registered on some network cell.

Test command returns the range of supported <mode>.

Syntax

Command	Command type
AT+CREG=[<mode>]	Set
AT+CREG?	Read
AT+CREG=?	Test

Parameters and Values

<mode>

- 0** Disable network registration unsolicited result code. **Default: 0.**
- 1** Enable network registration unsolicited result code.
If <mode>=1, unsolicited network registration result code reports:

+CREG: <stat>

where:

<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.

- 2** Enable network registration unsolicited result code with network cell identification data.
 If <mode>=2, unsolicited network registration result code reports:
 +CREG: <stat>[,<Lac>, <Ci>]

where:

<Lac> - Local Area Code for currently registered on cell.

<Ci> - Cell ID for currently registered on cell.

Notes

- Reference: 3GPP TS 27.007.

Example

```
AT
OK
at+creg?
+CREG: 0,2
OK
(the MODULE is in network searching state)
at+creg?
+CREG: 0,2
OK
at+creg?
+CREG: 0,2
OK
at+creg?
+CREG: 0,2
OK
at+creg?
+CREG: 0,1
OK
(the MODULE is registered)
at+creg?
+CREG: 0,1
OK
```

Operator Selection +COPS

Set command tries to select and register the GSM network operator.

Read command returns current value of <mode>, <format>, and <oper> in format <format>. If no operator is selected, <format> and <oper> are omitted.

+COPS: <mode>[, <format>, <oper>]

Test command returns a list of quadruplets, each representing an operator present in the network.

Commas separate the quadruplets in the list:

+COPS: [list of supported (<stat> ,<oper (in <format>=0)>,,
<oper (in <format>=2)>,)s][, (list of supported <mode>s),
(list of supported <format>s)]

where:

<stat>	Operator availability.
0	Unknown.
1	Available.
2	Current.
3	Forbidden.

Note: Because this command requires network scan, it may take a few second to return the output.

Syntax

Command	Command type
AT+CSCS?=[<mode>[,<format>[,<oper>]]]	Set
AT+COPS?	Read
AT+COPS=?	Test

Parameters and Values

<mode>	Defines whether the operator selection is done automatically or it is forced by this command to operator <oper>. The operator <oper> is given in format <format>.
0	Automatic choice. The parameter <oper> is ignored. Default: 0.
1	Manual choice. <oper> field is present.
2	De-register from GSM network; the module is kept unregistered until a +COPS with <mode>=0, 1 or 4 is issued.
3	Set only <format> parameter. The parameter <oper> is ignored.
4	<manual/automatic (<oper> field is present); if manual selection fails, automatic mode (<mode>=0) is entered.
<format>	
0	Alphanumeric long form. Maximum length is 16 digits. Default: 0.
2	Numeric 5 or 6 digits [country code (3) + network code (2 or 3)]
<oper>	Network operator in format defined by <format> parameter.

Notes

- <mode> parameter setting is stored in non-volatile memory and available at next reboot, if it is not 3—that is, set only <format> parameter.
- If <mode>=1 or 4, the selected network is stored in non-volatile memory too and is available at next reboot. This occurs even with a new SIM inserted.
- <format> parameter setting is never stored in non-volatile memory.
- Reference: 3GPP TS 27.007

Facility Lock/Unlock +CLCK

Execute command locks or unlocks a ME on a network facility.

Test command reports all the facilities supported by the device.

Syntax

Command	Command type
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	Execute
AT+CLCK=?	Test

Parameters and Values

<fac>	Facility.
“PS”	PH-SIM (lock Phone to SIM card) MT asks password when other than current SIM card inserted; MT may remember some previously used cards thus not requiring a password when they are inserted.
“PF”	Lock Phone to the first inserted SIM card. MT asks password when other than the first SIM card is inserted.
“MC”	Multi-country lock.
“SC”	SIM (PIN request) (device asks SIM password at power-up and when this lock command issued)
“AO”	BAOC (Barr All Outgoing Calls)
“OI”	BOIC (Barr Outgoing International Calls)
“OX”	BOIC-exHC (Barr Outgoing International Calls except to Home Country)
“AI”	BAIC (Barr All Incoming Calls)
“IR”	BIC-roam (Barr Incoming Calls when Roaming outside the home country)
“AB”	All Barring services (applicable only for <mode>=0)
“AG”	All out going barring services (applicable only for <mode>=0) (not yet supported)
“AC”	All incoming barring services (applicable only for <mode>=0)
“FD”	SIM fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
“PN”	Network personalization
“PU”	Network subset personalization
“PP”	Service provider personalization
“PC”	Corporate personalization
<mode>	Defines the operation to be done on the facility.
0	Unlock facility.
1	Lock facility.
2	Query status.

<passwd>

The same as password specified for the facility from the DTE user interface or with command Change Password +CPWD.

Note: When <mode>=2 and command successful, it returns:

+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>[...]]

where

<status> - the current status of the facility

0 - not active

1 - active

<class*n*> - class of information of the facility.

<class>

Sum of integers each representing a class of information. Default: 7.

- 1** Voice (telephony).
- 2** Data. Refers to all bearer services.
- 4** Fax. Facsimile services.
- 8** Short message service.
- 16** Data circuit sync.
- 32** Data circuit async.
- 64** Dedicated packet access.
- 128** Dedicated PAD access.

Notes

- Reference 3GPP TS 27.007.

Examples

When queried, to have the facility return output on three rows: the first for voice, the second for data, the third for fax:

```
AT+CLCK = "AO" , 2
+CLCK: <status> , 1
+CLCK: <status> , 2
+CLCK: <status> , 4
```

Change Facility Password +CPWD

Execute command changes the password for the facility lock function defined by command Facility Lock +CLCK.

Test command returns a list of pairs (<fac>,<pwdlength>) which presents the available facilities and the maximum length of their password (<pwdlength>).

Syntax

Command	Command type
AT+CPWD=<fac>, <oldpwd>, <newpwd>	Execute
AT+CPWD=?	Test

Parameters and Values

<fac>	Facility
"SC"	SIM (PIN request)
"AB"	All barring services
"P2"	SIM PIN2
"PS"	SIM VO
<oldpwd>	String type. The same as password specified for the facility from the ME user interface or with command +CPWD
<newpwd>	String type. The new password.

Notes

- Parameter <oldpwd> is the old password while <newpwd> is the new one.
- Reference: 3GPP TS 27.007

Examples

at+cpwd=?

+CPWD: ("SC" , 8) , ("AB" , 4) , ("P2" , 8) , ("PS" , 8)

OK

Calling Line Identification Presentation +CLIP

Set command enables or disables the presentation of the CLI (Calling Line Identity) at the terminal equipment. This command refers to the GSM supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the CLI of the calling party when receiving a mobile terminated call.

Read command returns the presentation status of the CLI in the format:

+CLIP: <n>,<m>

where:

<n>	
0	CLI presentation disabled. Default: 0.
1	CLI presentation enabled.
<m>	Status of the CLIP service.
0	CLIP not provisioned.
1	CLIP provisioned.
2	Unknown (for example, no network is present).

This command issues a status request to the network, so it may take a few seconds to give the answer due to the time needed to exchange data with it.

Test command returns the supported values for <n>.

Syntax

Command	Command type
AT+CLIP=[<n>]	Set
AT+CLIP?	Read
AT+CLIP=?	Test

Parameters and Values

<n>

0 Disables CLI indication. **Default: 0.**

1 Enables CLI indication.

If enabled the device reports after each RING the response:

+CLIP: <number>,<type>,"",128,<alpha>,<CLI_validity>

where:

<number> - String type, phone number of format specified by <type>

<type> - type of address octet in integer format

128 - both the type of number and the numbering plan are unknown

129 - unknown type of number and ISDN/Telephony numbering plan

145 - international type of number and ISDN/Telephony numbering plan. Contains the character "+".

<alpha> - String type, alphanumeric representation of <number> corresponding to the entry found in phonebook. Character set used is the one selected with command Select TE character set +CSCS.

<CLI_validity>

0 - CLI valid

1 - CLI withheld by the originator.

2 - CLI is not available due to interworking problems or limitation or originating network.

Notes

- In the +CLIP: response they are currently not reported either the subaddress information (it's always "" after the second comma) and the **subaddress type** information (it's always 128 after the third comma).
- The command changes only the reported behavior of the device. It does not change CLI supplementary service setting on the network.
- Reference: 3GPP TS 27.007.

Calling Line Identification Restriction +CLIR

Set command overrides the CLIR subscription when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. This command refers to CLIR-service (GSM 02.81) that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.

Read command gives the default adjustment for all outgoing calls (<n>) and triggers an interrogation of the provision status of the CLIR service (<m>), where:

<n> - facility status on the Mobile

0 - CLIR facility according to CLIR service network status

1 - CLIR facility active (CLI not sent)

2 - CLIR facility not active (CLI sent)

<m> - facility status on the Network

0 - CLIR service not provisioned

- 1 - CLIR service provisioned permanently
- 2 - unknown (for example no network present)
- 3 - CLI temporary mode presentation restricted
- 4 - CLI temporary mode presentation allowed

Test command reports the supported values of parameter <n>.

Syntax

Command	Command type
AT+CLIR=[<n>]	Set
AT+CLIR?	Read
AT+CLIR=?	Test

Parameters and Values

<n>	Facility status on the Mobile.
0	CLIR facility according to CLIR service network status. Default: 0.
1	CLIR facility active. CLI not sent.
2	CLIR facility not active. CLI sent.

Notes

- This command sets the default behavior of the device in outgoing calls.
- Reference: 3GPP TS 27.007.

Call Forwarding Number and Conditions +CCFC

Execute command controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Test command reports supported values for the parameter <reason>.

Syntax

Command	Command type
AT+CCFC=<reason>,<cmd>[,<number>[,<type>[,<class>[,<time>]]]]	Execute
AT+CCFC=?	Test

Parameters and Values

<reason>	
0	Unconditional.
1	Mobile busy.
2	No reply.
3	Not reachable.
4	All calls. Not with query command.
5	All conditional calls. Not with query command.
<cmd>	
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 octet in integer format.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<class>	Sum of integers each representing a class of information to which the command refers.
1	Voice (telephony).
2	Data.
4	Fax (facsimile services).
7	Voice + data + fax. Default: 7.
8	Short message service.
16	Data circuit sync.
32	Data circuit async.
64	Dedicated packet access.
128	Dedicated PAD access.
<time>	Time in seconds to wait before call is forwarded; it is valid only when <reason> "no reply" is enabled (<cmd>=1) or queried (<cmd>=2)
1-30	Automatically rounded to a multiple of 5 seconds. Default: 20. Note: When <cmd>=2 and command successful, it returns: +CCFC: <status>,<class1>[,<number>,<type>[,,,<time>]]][<CR><LF> +CCFC: <status>,<class2>[,<number>,<type>[,,,<time>]] [...] where: <status> - current status of the network service 0 - not active 1 - active <classn> - same as <class> <time> - it is returned only when <reason>=2 ("no reply") and <cmd>=2. The other parameters are described in the Parameters and Values section.

Notes

- When querying the status of a network service (<cmd>=2) the response line for 'not active' case (<status>=0) is returned only if service is not active for any <class>.
- Reference: 3GPP TS 27.007.

Call Waiting +CCWA

Set command controls the call waiting supplementary service. Activation, deactivation, and status query are reported.

Read command reports the current value of the parameter <n>.

Test command reports the supported values for the parameter <n>.

Syntax

Command	Command type
AT+CCWA=[<n>[,<cmd>[,<class>]]]	Set
AT+CCWA?	Read
AT+CCWA=?	Test

Parameters and Values

- <n>** Enables or disables the presentation of an unsolicited result code.
- 0** Disable.
 - 1** Enable.
- <cmd>** Enables, disables, or queries the service at network level.
- 0** Disable.
 - 1** Enable.
 - 2** Query status.
- <class>** Sum of integers each representing a class of information, which the command refers to.
- 1** Voice (telephony).
 - 2** Data.
 - 4** Fax (facsimile services).
 - 7** Voice + data + fax. Default: 7.
 - 8** Short message service.
 - 16** Data circuit sync.
 - 32** Data circuit async.
 - 64** Dedicated packet access.
 - 128** Dedicated PAD access.

Notes: The response to the query command is in the format:

```
+CCWA: <status>,<class1>[<CR><LF>
+CCWA: <status>,<class2>[ ... ]]
```

where:

<status> represents the status of the service:

0 - inactive

1 - active

<classn> - same as <class>

The unsolicited result code enabled by parameter <n> is in the format:

```
+CCWA: <number>,<type>,<class>,[<alpha>][,<cli_validity>]
```

where:

<number> - string type phone number of calling address in format specified by <type>

<type> - type of address in integer format

<class> - see before

<alpha> - string type; alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with +CSCS.

<cli_validity>

0 - CLI valid

1 - CLI has been withheld by the originator

2 - CLI is not available due to interworking problems or limitations of originating network

If parameter <cmd> is omitted then network is not interrogated.
In the query command the class parameter must not be issued.

The difference between call waiting report disabling (AT+CCWA = 0,1,7) and call waiting service disabling (AT+CCWA = 0,0,7) is that in the first case the call waiting indication is sent to the device by network but this last one does not report it to the DTE; instead in the second case the call waiting indication is not generated by the network. Hence the device results busy to the third party in the 2nd case while in the 1st case a ringing indication is sent to the third party.

The command AT+CCWA=1,0 has no effect and must not be issued.

Notes

- Reference: 3GPP TS 27.007

Call Holding Services +CHLD

Execute command controls the network call hold service. Use this command to manage call hold and multiparty conversation (conference call). Calls can be put on hold, recovered, released, or added to a conversation.

Test command returns the list of supported <n>s.

+CHLD: (0,1,1X,2,2X,3,4)

Syntax

Command	Command type
AT+CHLD=[<n>]	Execute
AT+CHLD=?	Test

Parameters and Values

<n>

- 0** Releases all held calls or sets the UDUB (User Determined User Busy) indication for a waiting call. (Only from version D.)
- 1** Releases all active calls (if any exist), and accepts the other (held or waiting) call.
- 1x** Releases a specific active call X.
- 2** Places all active calls, if any exist, on hold and accepts the other (held or waiting) call. If no calls are active, only OK is sent.
- 2X** Places all active calls on hold except call X with which communications is supported (only from version D).
- 3** Adds an held call to the conversation.
- 4** Connects two calls and disconnects the subscriber from both calls (Explicit Call Transfer).

Notes

- "X" is the call numbering (starting with 1) given by the sequence of setting up or receiving the calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released. New calls take the lowest available number.
- Where both a held and a waiting call exist, the above procedures apply to the waiting call (i.e. not to the held call) in conflicting situation.
- Only for VOICE calls.
- Reference: 3GPP TS 27.007.

Unstructured Supplementary Service Data +CUSD

Set command allows control of the Unstructured Supplementary Service Data (USSD [GSM 02.90]).

Read command reports the current value of the parameter <n>.

Test command reports the supported values for the parameter <n>.

Syntax

Command	Command type
AT+CUSD=[<n>[,<str>[,<dcs>]]]	Set
AT+CUSD?	Read
AT+CUSD=?	Test

Parameters and Values

<n>	Disables or enable the presentation of an unsolicited result code.
0	Disable the result code presentation in the DTA. Default: 0.
1	Enable the result code presentation in the DTA.
2	Cancel an ongoing USSD session. Not applicable to read command response.
<str>	USSD-string. When <str> parameter is not given, network is not interrogated.

If <dcs> indicates that GSM338 default alphabet is used ME/TA converts GSM alphabet into current TE character set. See +CSCS.

If <dcs> indicates that 8-bit data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number; for example octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65).

<dc> GSM 3.38 Cell Broadcast Data Coding Scheme in integer format. **Default: 0.**
 Note: The unsolicited result code enabled by parameter <n> is in the format:

+CUSD: <m>[,<str>,<dc>] to the TE

where:

<m>:

0 - no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation).

1 - further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)

2 - USSD terminated by the network

3 - other local client has responded

4 - operation not supported

5 - network time out

Notes

- Only mobile initiated operations are supported.
- Reference: 3GPP TS 27.007.

Advice of Charge +CAOC

Set command refers to the Advice of Charge supplementary services that enable subscriber to get information about the cost of calls; the command also includes the possibility to enable an unsolicited event reporting of the Current Call Meter (CCM) information.

Read command reports the value of parameter <mode> in the format:

+CAOC: <mode>

Test command reports the supported values for <mode> parameter.

Syntax

Command	Command type
AT+CAOC=<mode>	Set
AT+CAOC?	Read
AT+CAOC=?	Test

Parameters and Values

<mode>

- 0** Query CCM value.
- 1** Disables unsolicited CCM reporting.
- 2** Enables unsolicited CCM reporting.

Note: The unsolicited result code enabled by parameter <mode> is in the format:

+CCCM: <ccm>

where:

<ccm> - String type, current call meter in home units: three bytes of the CCM value in hexadecimal format. For example, "00001E" indicates decimal value 30.

Note: The unsolicited result code +CCCM is sent when the CCM value changes, but not more than every 10 seconds.

Notes

- +CAOC command returns an estimate of the cost of the current call only, produced by the MS and based on the information provided by either AoCI or AOCC supplementary services. It is not stored in the SIM.
- Reference: 3GPP TS 27.007.

List Current Calls +CLCC

Execute command returns the list of current calls and their characteristics in the format:

```
[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[...]]]
```

where:

<idn>	Call identification number.
<dir>	Call direction.
0	Mobile originated call.
1	Mobile terminated 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>	Call type.
0	Voice.
1	Data.
2	Fax.
9	Unknown.
<mpty>	Multiparty call flag.
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 phone number octet in integer format.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<alpha>	String type, alphanumeric representation of <number> corresponding to the entry found in phonebook. Character set used is the one selected with +CSCS. Note: If no call is active then only OK message is sent. This command is useful in conjunction with command +CHLD to know the various call status for call holding.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CLCC	Execute
AT+CLCC=?	Test

Notes

- Reference: 3GPP TS 27.007.

SS Notification +CSSN

This command controls supplementary service related network initiated notifications.

Set command enables or disables the presentation of notification result codes from TA to TE.

Read command reports the current value of the parameters.

Test command reports the supported range of values for <n>, <m>.

Syntax

Command	Command type
AT+CSSN=[<n>,<m>]]	Set
AT+CSSN?	Read
AT+CSSN=?	Test

Parameters and Values

<n> Sets the +CSSI result code presentation status.

0 Disable. **Default: 0.**

1 Enable.

<m> Sets the +CSSU result code presentation status

0 Disable. **Default: 0.**

1 Enable.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code:

+CSSI: <code1>

is sent to TE before any other MO call setup result codes, where:

<code1>

0 Unconditional call forwarding is active.

1 Some of the conditional call forwardings are active.

2 Call is forwarded.

3 Call is waiting.

5 Outgoing calls are barred.

6 Incoming calls are barred.

When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, an unsolicited result code:

+CSSU: <code2>

is sent to TE, where:

<code2>

- | | |
|---|--|
| 0 | This is a forwarded call (MT call setup). |
| 2 | Call is put on hold (during a voice call). |
| 3 | Call is retrieved (during a voice call). |

Notes

- Reference: 3GPP TS 27.007.

Closed User Group +CCUG

Set command allows control of the Closed User Group supplementary service [GSM 02.85]

Read command reports the current value of the parameters.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CCUG=[<n>[,<index>[,<info>]]]	Set
AT+CCUG?	Read
AT+CCUG=?	Test

Parameters and Values

<n>

- | | |
|---|---|
| 0 | Disable CUG temporary mode. Default: 0. |
| 1 | Enable CUG temporary mode: it enables to control the CUG information on the air interface as a default adjustment for all following outgoing calls. |

<index>

- | | |
|-----|---|
| 0-9 | CUG index. |
| 10 | No index (preferential CUG taken from subscriber data). Default: 10. |

<info>

- | | |
|---|------------------------------------|
| 0 | No information. Default: 0. |
| 1 | Suppress Outgoing Access (OA). |
| 2 | Suppress preferential CUG. |
| 3 | Suppress OA and preferential CUG. |

Notes

- Reference: 3GPP TS 27.007.

Preferred Operator List +CPOL

Execute command writes an entry in the SIM preferred operators list.

Read command returns all used entries from the SIM preferred operators list.

Test command returns the whole <index> range supported by the SIM and the range for <format>.

Syntax

Command	Command type
AT+CPOL=[<index>][,<format>[,<oper>]]	Execute
AT+CPOL?	Read
AT+CPOL=?	Test

Parameters and Values

<index>	Integer type. The order number of operator in the SIM preferred operator list
1-n	
<format>	
2	Numeric <oper>
<oper>	String type.

Notes

- If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed.
- Reference: 3GPP TS 27.007

Selection of preferred PLMN list +CPLS

Execute command selects a list of preferred PLMNs in the SIM/USIM.

Read command returns the selected PLMN selector <list> from the SIM/USIM.

Test command returns the whole index range supported <list>s by the SIM/USIM.

Syntax

Command	Command type
AT+CPLS=<list>	Execute
AT+CPLS?	Read
AT+CPLS=?	Test

Parameters and Values

<list>	
0	User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel. This file is only available in SIM card or GSM application selected in UICC.
1	Operator controlled PLMN selector with Access Technology EFOPLMNwAcT.
2	HPLMN selector with Access Technology EFHPLMNwAcT.

Notes

- The value set by command is stored in non-volatile memory. The value does not depend on the specific CMUX instance.

Call Deflection +CTFR

Set command requests a service that causes an incoming alerting call to be forwarded to a specified number. This is based on the GSM/UMTS supplementary service CD (Call Deflection. Refer to 3GPP TS 22.072.

Test command tests for command existence.

Syntax

Command	Command type
AT+CTFR=<number>[,<type>]	Set
AT+CTFR=?	Test

Parameters and Values

<number>	String type, phone number of format specified by <type>.
<type>	Type of address octet in integer format. Default is 145 when dialing string includes international access code character "+", otherwise 129 . Note: Call Deflection is only applicable to an incoming voice call.

Mobile Equipment Control

Phone Activity Status +CPAS

Execute command reports the device status in the form:

+CPAS: <pas>

where:

<pas>	Phone activity status.
0	Ready. Device allows commands from TA/TE.
1	Unavailable. Device does not allow commands from TA/TE.
2	Unknown. Device is not guaranteed to respond to instructions.
3	Ringing. Device is ready for commands from TA/TE, but the ringer is active.
4	Call in progress. Device is ready for commands from TA/TE, but a call is in progress.

Test command reports the supported range of values for <pas>.

Syntax

Command	Command type
AT+CPAS	Execute
AT+CPAS=?	Test

Notes

- Although +CPAS is an Execute command, ETSI 07.07 requires the Test command to be defined.
- Reference: 3GPP TS 27.007.

Example

```
ATD03282131321;
```

```
OK
```

```
AT+CPAS
```

```
+CPAS: 4    A call is in progress.
```

```
OK
```

```
ATH
```

```
OK
```

Set Phone Functions +CFUN

Set command selects the level of function in the ME.

Read command reports the current setting of <fun>.

Test command returns the list of supported values for <fun> and <rst>.

Syntax

Command	Command type
AT+CFUN=[<fun>,<rst>]]	Set
AT+CFUN?	Read
AT+CFUN=?	Test

Parameters and Values

<fun>	Power saving function mode.
0	Minimum functions, NON-CYCLIC SLEEP mode. In this mode, the AT interface is not accessible. Consequently, once you have set <fun> level 0 do not send additional characters. Otherwise, these characters remain in the input buffer and may delay the output of an unsolicited result code. The first wake-up event stops power saving and takes the ME back to a fully functioning level <fun>=1.
1	Mobile full functions with power saving disabled. Default: 1.
2	Disable TX.
4	Disable both TX and RX.
5	Mobile full functions with power saving enabled.
7	CYCLIC SLEEP mode. In this mode, the serial interface is periodically enabled while CTS is active. If characters are recognized on the serial interface, the ME stays active for 2 seconds after the last character was sent or received. ME exits SLEEP mode only, if AT+CFUN=1 is entered.
9	Same as 0, but with different wake-up events.
<rst>	Reset flag.
0	Do not reset the ME before setting it to <fun> function level.
1	Reset the device. The device is fully functional after the reset. This value is available only for <fun> = 1.

Notes

- Issuing AT+CFUN=4[,0] causes the module to perform either a network deregistration or a SIM deactivation.

- If power saving enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity.
- To place the module in power saving mode, set the <fun> parameter at value = 5 and the line DTR (RS232) must be set to OFF. Once in power saving, the CTS line switch to the OFF status to signal that the module is really in power saving condition.
- During the power saving condition, before sending any AT command on the serial line, the DTR must be set to ON (0V) to exit from power saving and it must be waited for the CTS (RS232) line to go in ON status.
- Until the DTR line is ON, the module does not return to the power saving condition.
- The power saving function does not affect the network behavior of the module; even during the power save condition, the module remains registered on the network and reachable for incoming calls or SMS. If a call comes in during the power save, then the module wake ups and proceeds normally with the unsolicited incoming call code.
- Reference: 3GPP TS 27.007.

Enter PIN +CPIN

Set command sends a password to the device, which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, and so on).

If the PIN required is SIM PUK or SIM PUK2, the <newpin> is required. This second pin, <newpin> replaces the old pin in the SIM.

Use the command to change the SIM PIN by sending it with both parameters <pin> and <newpin> when PIN request is pending. If no PIN request is pending, the command returns an error code and to change the PIN the command +CPWD must be used instead.

Read command reports the PIN/PUK/PUK2 request status of the device in the form:

+CPIN: <code>

where:

<code>	PIN/PUK/PUK2 request status code.
READY	ME is not pending for any password .
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 password.
PH-FSIM PIN	ME is waiting for phone-to-very first SIM card password.
PH-FSIM PUK	ME is waiting for phone-to-very first SIM card unblocking password.
SIM PIN2	ME is waiting for SIM PIN2. This <code> is returned only when the last executed command resulted in PIN2 authentication failure; that is, +CME ERROR: 17.
SIM PUK2	ME is waiting for SIM PUK2. This <code> is returned only when the last executed command resulted in PUK2 authentication failure, +CME ERROR: 18.
PH-NET PIN	ME is waiting for network personalization password.
PH-NET PUK	ME is waiting for network personalization unblocking password.
PH-NETSUB PIN	ME is waiting for network subset personalization password.
PH-NETSUB PUK	ME is waiting for network subset personalization unblocking password.
PH-SP PIN	ME is waiting for service provider personalization password.
PH-SP PUK	ME is waiting for service provider personalization unblocking password.
PH-CORP PIN	ME is waiting for corporate personalization password.
PH-CORP PUK	ME is waiting for corporate personalization unblocking password.

Note: Pin pending status at startup depends on PIN facility setting. To change or query the default power up setting use the command AT+CLCK=SC,<mode>,<pin>.

Test command returns OK result code.

Syntax

Command	Command type
AT+CPIN=<pin>[,<newpin>]	Set
AT+CPIN?	Read
AT+CPIN=?	Test

Parameters and Values

<pin>

String type value.

<newpin>

String type value.

To check the status of the PIN request use the command AT+CPIN?

Note: If all parameters are omitted then the behavior of Set command is the same as Read command.

The following commands are accepted when ME is pending SIM PIN or SIM PUK. These commands, except those shaded, can be issued even if the SIM card is not inserted. Except for +CSDH and +CNMI, these commands can be issued even if the MD is waiting for a phone-to-SIM card password.

A	#DAC	#CSURVNL	+CPIN
D	#VAUX	#CSURVEXT	+CSQ
H	#VAUXSAV	#JDR	+CIND
O	#CBC	#WSCRYPT	+CMER
E	#AUTOATT	#ESCRIP	+CCLK
I	#MONI	#RSCRIPT	+CALA
L	#SERVIN	#LSCRIPT	+CALD
M	#QSS	#DSCRIPT	+CRSM
P	#DIALMODE	#REBOOT	+CALM
Q	#ACAL	#CMUXSCR	+CRSL
S	#ACALEXT	#STARTMODESCR	+CLVL
T	#CODEC	#EXECSCR	+CMUT
V	#SHFEC	#RSEN	+CLAC
X	#HFMICG	#CCID	#CMEE
Z	#HSMICG	#PLMNMODE	+CGREG
&C	#SHFSD	#V24CFG	+CBC
&D	#BND	#V24	+CSDH
&F	#AUTOBND	+FCLASS	+CNMI
&K	#RTCSTAT	+GCAP	+CHUP
&N	#USERID	+GCI	+CRLP
&P	#PASSW	+IPR	+CR
&S	#PKTSZ		+CRC
&V	#DSTO	+IFC	+CSNS
&W	#SKTTO	+ILRR	+CREG
&Y	#SKTSET	+ICF	+COPS
&Z	#SKTOP	+MS	+CLIP

%E	#SKTCT	+DS	+CPAS
%L	#SKTSAV	+DR	#ERST
%Q	#SKTRST	+CGMI	#EMAILMSG
\Q	#SPKMUT	+CGMM	#CSURV
\R	#ESMTP	+CGMR	#CSURVC
\V	#EADDR	+GMI	#CSURVU
#CGMI	#EUSER	+GMM	#CSURVUC
#CGMM	#EPASSW	+GMR	#CSURVB
#CGMR	#SEMAIL	+CGSN	#CSURVBC
#CGSN	#EMAILD	+GSN	#CSURVF
#CAP	#ESAV	+CMUX	#WAKE
#SRS	#SRP	#PCT	+CFUN
#QTEMP	#STM	#SHDN	#ADC

Notes

- Reference: 3GPP TS 27.007

Examples

AT+CMEE=1

OK

AT+CPIN?

+CME ERROR: 10 Error: You have to insert the SIM.

AT+CPIN?

+CPIN: READY You inserted the SIM and device is not waiting for PIN to be given.

OK

Signal Quality +CSQ

Execute command reports received signal quality indicators.

Test command returns the supported range of values of the parameters <rsqi> and <ber>. Although +CSQ is an Execute command without parameters, ETSI 07.07 requires the test command to be defined.

Syntax

Command	Command type
AT+CSQ	Execute
AT+CSQ=?	Test

Execute command reports received signal quality indicators in the form:

+CSQ: <rsqi>,<ber>

where:

<rsqi>	Received signal strength indication.
0	(-113) dBm or less
1	(-111) dBm

2-30	(-109) dBm-(-53)dBm / 2 dBm per step
31	(-51) dBm or greater
99	Not known or not detectable
<ber>	Bit error rate (in percent)
0	Less than 0.2%
1	0.2% to 0.4%
2	0.4% to 0.8%
3	0.8% to 1.6%
4	1.6% to 3.2%
5	3.2% to 6.4%
6	6.4% to 12.8%
7	More than 12.8%
99	Not known or not detectable

Notes

- Since GSM relevant parameters are radio link and no line is present, use this command instead of %Q and %L.
%Q and %L have no meaning.
- Reference: 3GPP TS 27.007.

Indicator Control +CIND

Set command controls the registration state of ME indicators, in order to automatically send the +CIEV URC, whenever the value of the associated indicator changes. The supported indicators (<descr>) and their order appear from test command AT+CIND=?.

Read command returns the current value of ME indicators, in the format:

+CIND: <ind>[,<ind>[,...]]

Note: The order of the values <ind>s is the same order appears from test command AT+CIND=?

Test command returns pairs, where string value <descr> is a description (maximum of 16 characters) of the indicator and compound value is the supported values for the indicator, in the format:

+CIND: ((<descr>, (list of supported <ind>s))[,(<descr>, (list of supported <ind>s))[,...]])

where:

<descr>	Indicator names as follows (along with their <ind> ranges).
"battchg"	Battery charge level.
<ind>	Battery charge level indicator range .
0-5	
99	Not measurable.
"signal"	Signal quality.
<ind>	Signal quality indicator range.
0-7	
99	Not measurable.
"service"	Service availability.
<ind>	Service availability indicator range.
0	Not registered to any network.
1	Registered.

"sounder"	Sounder activity.
<ind>	Sounder activity indicator range.
0	No sound activity.
1	Some sound activity.
"message"	Message received.
<ind>	Message received indicator range.
0	No unread short message at memory location "SM".
1	Unread short message at memory location "SM".
"call"	Call in progress.
<ind>	Call in progress indicator range.
0	No calls in progress.
1	At least a call is established.
"roam"	Roaming.
<ind>	Roaming indicator range.
0	Registered to home network or not registered.
1	Registered to other network.
"smsfull"	Short message memory storage in the MT is full (1), or memory locations are available (0).
<ind>	Short message memory storage indicator range.
0	Memory locations are available
1	Short message memory storage in the MT is full.
"rsi"	Received signal (field) strength
<ind>	Received signal strength level indicator range
0	Signal strength \leq (-112) dBm
1-4	Signal strength in (-97) dBm.. (-66) dBm (15 dBm steps)
5	Signal strength \geq (-51) dBm
99	Not measurable.

Syntax

Command	Command type
AT+CIND=[<state>[,<state>[,...]]]	Set
AT+CIND?	Read
AT+CIND=?	Test

Parameters and Values

<state>	Registration state.
0	The indicator is deregistered; there's no unsolicited result code (+CIEV URC) automatically sent by the ME to the application, whenever the value of the associated indicator changes; the value can be directly queried with +CIND?
1	The indicator is registered. An unsolicited result code (+CIEV URC) is automatically sent by the ME to the application, whenever the value of the associated indicator changes; it is still possible to query the value through +CIND? Default: 1.

Note: When the ME is switched on, all of the indicators are in registered mode.

Notes

- See command +CMER.
- Reference: 3GPP TS 27.007.

Examples

Command causes all the indicators to be registered

```
AT+CIND=1,1,1,1,1,1,1,1,1
```

Command causes all the indicators to be de-registered

```
AT+CIND=0,0,0,0,0,0,0,0,0
```

Command to query the current value of all indicators

```
AT+CIND?
```

```
CIND: 4,0,1,0,0,0,0,0,2
```

```
OK
```

Mobile Equipment Event Reporting +CMER

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of indicator state changes. Sending URCs if keys are pressed or display changes has not been implemented.

Read command returns the current setting of parameters, in the format:

```
+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>
```

Test command returns the range of supported values for <mode>, <keyp>, <disp>, <ind>, <bfr>, in the format:

```
+CMER: (list of supported <mode>s),(list of supported <keyp>s),  
(list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s)
```

Syntax

Command	Command type
AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]]]]]	Set
AT+CMER?	Read
AT+CMER=?	Test

Parameters and Values

- <mode>** Controls the processing of unsolicited result codes.
- 0** Discard +CIEV unsolicited result codes.
 - 1** Discard +CIEV unsolicited result codes when TA-TE link is reserved (for example on-line data mode); otherwise forward them directly to the TE.
 - 2** Buffer +CIEV unsolicited result codes in the TA when TA-TE link is reserved (for example on-line data mode). Flush them to the TE after reservation; otherwise forward them directly to the TE.
 - 3** Forward +CIEV unsolicited result codes directly to the TE. When TA is in on-line data mode each +CIEV URC is replaced with a Break (100 ms), and is stored in a buffer. Once the ME goes into command mode (after +++ was entered), all URCs stored in the buffer are output.
- <keyp>** Keypad event reporting.
- 0** No keypad event reporting.
- <disp>** Display event reporting.
- 0** No display event reporting.

<ind>	Indicator event reporting.
0	No indicator event reporting.
2	Indicator event reporting.
<bfr>	TA buffer clearing.
0	TA buffer of unsolicited result codes is cleared when <mode> 1-3 is entered.

Notes

- After AT+CMER is switched on—with for example the AT+CMER=2,0,0,2 command; that is <bfr> is 0—URCs for all registered indicators are issued only first time, if previous <mode> was 0, for backward compatibility. Values shown by the indicators are current indicators values, not buffered ones. Subsequent AT+CMER commands with <mode> different from 0 and <bfr> equal to 0 do not flush the codes, even if <mode> was set again to 0 before. To flush the codes, <bfr> must be set to 1.
- Although it is possible to issue the command when SIM PIN is pending, it answers ERROR if “message” or “smsfull” indicators are enabled in AT+CIND, because with pending PIN it is not possible to give a correct indication about SMS status. To issue the command when SIM PIN is pending you must disable “message” and “smsfull” indicators in AT+CIND first.
- Reference: 3GPP TS 27.007.

Select Phonebook Memory Storage +CPBS

Set command selects phonebook memory storage <storage> that is used by other phonebook commands.

Read command returns the actual values of the parameter <storage>, the number of occupied records <used> and the maximum index number <total>, in the format:

+CPBS: <storage>,<used>,<total>

Test command returns the supported range of values for the parameters <storage>.

Syntax

Command	Command type
AT+CPBS=<storage>	Set
AT+CPBS?	Read
AT+CPBS=?	Test

Parameters and Values

This device supports the following values:

<storage>	
“SM”	SIM phonebook.
“FD”	SIM fixed dialing phonebook (only phase 2/2+ SIM)
“LD”	SIM last dialing phonebook (+CPBF is not applicable for this storage).
“MC”	Device missed (unanswered received) calls list. +CPBF is not applicable for storage.
“RC”	ME received calls list. +CPBF is not applicable for this storage.
“MB”	Mailbox numbers stored on SIM. This storage option is available only if mailbox services are provided by the SIM. See #MBN.

Notes

- For <storage>="MC": if there is more than one missed call from the same number, the Read command returns only the last call.
- Reference: 3GPP TS 27.007.

Write Phonebook Entry +CPBW

Execute command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

Test command returns location range supported by the current storage as a compound value, the maximum length of <number> field, supported number format of the storage and maximum length of <text> field. The format is:

+CPBW: (list of supported <index>s),<nlength>,(list of supported <type>s),<tlength>

where:

<nlength> - integer type value indicating the maximum length of field <number>.

<tlength> - integer type value indicating the maximum length of field <text>.

Syntax

Command	Command type
AT+CPBW=[<index>][,<number> [<type>,<text>]]	Execute
AT+CPBW=?	Test

Parameters and Values

<index>	Integer type, value in the range of location numbers of the currently selected phonebook memory storage. See +CPBS.
<number>	String type, phone number in the format <type>.
<type>	Type of number.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".
<text>	String type, the text associated to the number. The used character set is the one selected with command +CSCS.

If record number <index> already exists, it is overwritten.

If either <number>, <type> and <text> are omitted, the phonebook entry in location <index> is deleted.

If <index> is omitted or <index>=0, the number <number> is stored in the first free phonebook location. (example at+cpbw=0,"+390404192701",129,"Text" and at+cpbw=","+390404192701",129,"Text").

If either "LD", "MC" or "RC" memory storage is selected (see + CPBS), it is possible just to delete the phonebook entry in location <index>, therefore parameters <number>, <type> and <text> must be omitted.

Notes

- Before issuing PB commands, select the PB storage with +CPBS command.
- Reference: 3GPP TS 27.007

Read Phonebook Entries +CPBR

Execute command returns phonebook entries in location number range <index1>..<index2> from the current phonebook memory storage selected with +CPBS. If <index2> is omitted, only location <index1> is returned.

Test command returns the supported range of values for <indexn> and the maximum lengths of <number> and <text> fields, in the format:

+CPBR: (<minIndex> - <maxIndex>),<nlength>,<tlength>

where:

<minIndex>	the minimum <index> number, integer type
<maxIndex>	the maximum <index> number, integer type
<nlength>	maximum <number> field length, integer type
<tlength>	maximum <name> field length, integer type

Syntax

Command	Command type
AT+CPBR=<index1>[,<index2>]	Execute
AT+CPBR=?	Test

Parameters and Values

<index1> Integer type, value in the range of location numbers of the currently selected phonebook memory storage. See +CPBS.

<index2> Integer type, value in the range of location numbers of the currently selected phonebook memory storage. See +CPBS.

If the storage is ME, the response format is:

```
[+CPBR: <index1>,<number>,<type>,<text>[<CR><LF>
+CPBR: <index2>,<number>,<type>,<text>[...]]]
```

If the storage is "DC" and "RC" then the response format is:

```
[+CPBR: <index1>,<number>,<type>,<text>,<time>,<duration>[<CR><LF>
+CPBR: <index2>,<number>,<type>,<text>,<time>,<duration>[...]]]
```

If the storage is "MC" then the response format is:

```
[+CPBR: <index1>,<number>,<type>,<text>,<time>[<CR><LF>
+CPBR: <index2>,<number>,<type>,<text>,<time>[...]]]
```

where:

<indexn> - Location number of the phonebook entry

<number> - String type, phone number of format <type>

<type> - Type of phone number octet in integer format

129 - National numbering scheme

145 - International numbering scheme. Contains the character "+".

<text> - The alphanumeric text associated to the number. Used character set is the one selected with command +CSCS.

<e_text> - Email alphanumeric text; used character set should be the one selected with command +CSCS.

<time> - Date and time in clock seconds.

<duration> - Duration of the call.

Note: If MC is the currently selected phonebook memory storage, a sequence of missed calls coming from the same number is saved as one missed call. +CPBR shows one line of information.

If all queried locations are empty (but available), no information text lines returned, while if listing fails in an ME error, +CME ERROR: <err> is returned.

Notes

- Before issuing PB commands, select the PB storage with +CPBS command.
- Reference: 3GPP TS 27.007.

Find Phonebook Entries +CPBF

Execute command returns phonebook entries, from the current phonebook memory storage (selected with +CPBS), which starts with alphanumeric string <findtext>.

Test command reports the maximum lengths of <number> and <text> fields, in the format:

+CPBF: [<nlength>],[<tlength>]

where:

- <nlength> Maximum length of field <number>, integer type.
- <tlength> Maximum length of field <text>, integer type .

Note: The value of <nlength> varies, depending on whether or not the ENS functionality has been previously enabled (see #ENS), in the following situations:

- 6.
- 7. 1. If you select “SM” memory storage (see +CPBS) and the SIM supports the Extension1 service
- 8. 2. If you select “FD” memory storage (see +CPBS) and the SIM supports the Extension2 service
- a. If you select “MB” memory storage (see +CPBS) and the SIM support the Extension6 service

Syntax

Command	Command type
AT+CPBF=<findtext>	Execute
AT+CPBF=?	Test

Parameters and Values

- <findtext> String type. The command +CSCS selects the character set used. The command returns a report in the form:

[+CPBF: <index1>,<number>,<type>,<text>[<CR><LF>
+CPBF: <index2>,<number>,<type>,<text>[...]]]

where:

<indexn> - the location number of the phonebook entry

<number> - String type, phone number of format <type>.

<type> - type of phone number octet in integer format

129 - National numbering scheme

145 - International numbering scheme. Contains the character "+".

<text> - the alphanumeric text associated to the number; used character set is the one selected with command +CSCS.

Notes: +CPBF is not applicable if the current selected storage (see +CPBS) is either "MC", either "RC" or "DC".

If <findtext>="" the command returns all the phonebook records.

If no PB records satisfy the search criteria, an ERROR message is reported.

Notes

- Remember to select the PB storage with +CPBS command before issuing PB commands.
- Reference: 3GPP TS 27.007.

Example

```
AT+CPBS=?
```

```
+CPBS: ( "ME" , "DC" , "MC" , "RC" )
```

```
OK
```

Clock Management +CCLK

Set command sets the real-time clock of the ME.

Read command returns the current setting of the real-time clock, in the format <time>.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CCLK=<time>	Set
AT+CCLK?	Read
AT+CCLK=?	Test

Parameters and Values

<time>	Current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz"
yy	Year (two last digits are mandatory). Range is 00-99.
MM	Month (two last digits are mandatory). Range is 01-12.
dd	Day. Two last digits are mandatory. The range for dd (day) depends on the month and year it refers to. Available ranges are: (01-28) (01-29) (01-30) (01-31)
	Trying to enter an out of range value raises an error.

hh	Hour. Two last digits are mandatory. Range is 00-23.
mm	Minute. Two last digits are mandatory. Range is 00-59.
ss	Seconds. Two last digits are mandatory. Range is 00-59.
±zz	Time zone. Indicates the difference, expressed in quarter of an hour, between the local time and GMT. Two last digits are mandatory. Range is -47 to +48.

Example

```
AT+CCLK="02/09/07,22:30:00+00"
```

```
OK
```

```
AT+CCLK?
```

```
+CCLK: 02/09/07,22:30:25
```

```
OK
```

Alarm Management +CALA

Set command stores in the internal Real Time Clock an alarm time with respective settings. It is possible to set up a recurrent alarm for one or more days in the week.

Currently just one alarm can be set.

When the RTC time reaches the alarm time, then the alarm starts. The module's behavior depends upon the setting <type> and if the device was already ON when the alarm time came.

Read command returns the list of current active alarm settings in the ME, in the format:

```
[+CALA: <time>,<n>,<type>,<[<text>],<recurr>,<silent>]
```

Test command returns the list of supported index values (currently just 0), alarm types, maximum length of the text to be displayed, maximum length of <recurr> and supported <silent>s, in the format:

```
+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>,<rlength>,(list of supported <silent>s)
```

Syntax

Command	Command type
AT+CALA=<time>,<n>,<type>,<[<text>],<recurr>,<silent>]]]]	Set
AT+CALA?	Read
AT+CALA=?	Test

Parameters and Values

<time>	Current alarm time as quoted string.
""	Empty string. Deletes the current alarm and resets all the +CALA parameters to the default configuration.
"hh:mm:ss±zz"	Format used only when issuing +CALA with parameter <recurr> too
"yy/MM/dd,hh:mm:ss±zz"	Generic format: it's the same as defined for +CCLK.
<n>	Index of the alarm.
0	The only value supported is 0
<type>	Alarm behavior type
0	Reserved for other equipment use

1	The module simply wakes up fully operative as if the ON/OFF button had been pressed. If the device is already ON at the alarm time, then it does nothing. Default: 1.
2	The module wakes up in alarm mode if it was off at the alarm time. Otherwise, it remains fully operative. In both cases, the module issues an unsolicited code every 3 seconds.
+CALA: <text>	
where <text> is the +CALA optional parameter previously set.	
The device keeps on sending the unsolicited code every 3 seconds until a #WAKE or #SHDN command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds then it shuts down.	
3	The module wakes up in alarm mode if it was off at the alarm time. Otherwise, it remains fully operative. In both cases, the module starts playing the alarm tone on the selected path for the ringer. See command #SRP.
The device keeps playing the alarm tone until a #WAKE or #SHDN command is received or a 90-second timeout occurs. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds then it shuts down.	
4	The module wakes up in alarm mode if it was off at the alarm time. Otherwise, it remains fully operative. If the device is in alarm mode and it does not receive the #WAKE command within 90 seconds then it shuts down.
5	The module makes both the actions as for type=2 and <type>=3.
6	The module makes both the actions as for type=2 and <type>=4.
7	The module makes both the actions as for type=3 and <type>=4.
8	The module wakes up in alarm mode if it was off at the alarm time. Otherwise, it remains fully operative. In both cases, the module sets High the RI output pin. The RI output pin remains High until next #WAKE issue or until a 90 second timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90 seconds. After that, it shuts down.
<text>	Unsolicited alarm code text string. It has meaning only if <type> is equal to 2, 5 or 6.
<recurr>	String type, value indicating day of week for the alarm in one of the following formats:
"<1..7>[,<1..7>[, ...]]"	Sets a recurrent alarm for one or more days in the week; the digits 1 to 7 corresponds to the days in the week. Monday is 1.
"0"	Sets a recurrent alarm for all days in the week.
<silent>	Integer type indicating if the alarm is silent or not.
0	The alarm is not silent.
1	The alarm is silent.

During the "alarm mode" the device does not make any network scan and does not register to any network and therefore is not able to dial or receive any call or SMS, the only commands that can be issued to the module in this state are the #WAKE and #SHDN, every other command must not be issued during this state.

Note: You must set the RTC (issuing +CCLK) at least once before you can issue +CALA with <type>=8.

Notes

- Reference: ETSI 07.07, ETSI 27.007.

Example

```

AT+CALA="02/09/07,23:30:00+00"
OK
AT+CALA="12/09/07,10:38:00+02",0,2,GO GET SOME COFFEE,"",0
AT+CALA?
+CALA: "12/09/07,10:38:00",0,2,"GOGETSOMECOFFEE","",0
OK
    
```

Delete Alarm +CALD

Execute command deletes an alarm in the ME.

Test command reports the range of supported values for <n> parameter.

Syntax

Command	Command type
AT+CALD=<n>	Execute
AT+CALD=?	Test

Parameters and Values

<n>

0

Notes

- Reference: 3G TS 27.007

Setting Date Format +CSDF

This command sets the format of date information shown to the user, which is specified by use of the <mode> parameter. The <mode> affects the date format on the phone display and does not affect the date format of the AT command serial interface, so it is not used.

The command also sets the date format of the TE-TA interface, which is specified by use of the <auxmode> parameter—that is, the <auxmode> affects the <time> of AT+CCLK and AT+CALA. If the parameters are omitted then this sets the default value of <mode>.

Read command reports the currently selected <mode> and <auxmode> in the format:

+CSDF: <mode>,<auxmode>

Test command reports the supported range of values for <mode> and <auxmode>.

Syntax

Command	Command type
AT+CSDF=[<mode>,<auxmode>]]	Set
AT+CSDF?	Read
AT+CSDF=?	Test

Parameters and Values

<mode>

- | | |
|---|---------------------------------|
| 1 | DD-MMM-YYYY. Default: 1. |
| 2 | DD-MM-YY |
| 3 | MM/DD/YY |
| 4 | DD/MM/YY |
| 5 | DD.MM.YY |
| 6 | YYMMDD |
| 7 | YY-MM-DD |

<auxmode>

- | | |
|---|------------------------------|
| 1 | yy/MM/dd. Default: 1. |
| 2 | yyyy/MM/dd |

Notes

- When <auxmode>=1, the <time> format of +CCLK and +CALA is "yy/MM/dd,hh:mm:ss+zz". When <auxmode>=2 it is "yyyy/MM/dd,hh:mm:ss+zz".

Setting Time Format +CSTF

This command sets the time format of the time information presented to the user, which is specified by use of the <mode> parameter. The <mode> affects the time format on the phone display and does not affect the time format of the AT command serial interface, so it not actually not used.

Read command reports the currently selected <mode> in the format:

+CSTF: <mode>

Test command reports the supported range of values for <mode>.

Syntax

Command	Command type
AT+CSTF=[<mode>]	
AT+CSTF?	Read
AT+CSTF=?	Test

Parameters and Values

<mode>

- | | |
|---|---|
| 1 | HH:MM 24 hour clock. Default: 1. |
| 2 | HH:MM a.m./p.m. |

Time Zone Reporting +CTZR

This command enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed.

Read command reports the currently selected <onoff> in the format:

+CTZR: <onoff>

Test command reports the supported range of values for parameter <onoff>

Syntax

Command	Command type
AT+CTZR=<onoff>	
AT+CTZR?	Read
AT+CTZR=?	Test

Parameters and Values

<onoff>

- | | |
|---|--|
| 0 | Disable time zone change event reporting. Default: 0. |
| 1 | Enable time zone change event reporting. |

Automatic Time Zone Update +CTZU

This command enables and disables automatic time zone update through NITZ.

Read command reports the currently selected <onoff> in the format:

+CTZU: <onoff>

Test command reports the supported range of values for parameter <onoff>.

Syntax

Command	Command type
AT+CTZU=<onoff>	
AT+CTZU?	Read
AT+CTZU=?	Test

Parameters and Values

<onoff>

- | | |
|---|---|
| 0 | Disable automatic time zone update via NITZ. Default: 0. |
| 1 | Enable automatic time zone update via NITZ |

Notes

- The command AT+CTZU=1 enables automatic update of the date and time set by AT+CCLK command (not only time zone). This happens when a Network Identity and Time Zone (NITZ) message is sent by the network. This command is the ETSI standard equivalent of Telit custom command AT#NITZ=1. If command AT+CTZU=1, or AT#NITZ=1 (or both) is issued, NITZ message causes a date and time update.

Restricted SIM Access +CRSM

Execute command transmit the SIM <command> and its parameters to the ME. ME handles internally all SIM=ME interface locking and file selection routines. As response to the command, ME sends the actual SIM information parameters and response data.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CRSM= <command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]	Execute
AT+CRSM=?	Test

Parameters and Values

<command>	Command passed by the ME to the SIM.
176	Read binary.
176	Read record.
192	Get response.
214	Update binary.
220	Update record.
242	Status
<fileid>	Identifier of an elementary data file on SIM. Required for every command except STATUS.
<P1>,<P2>,<P3>	Parameter passed by the ME to the SIM. They are mandatory for every command except GET RESPONSE and STATUS.
0-255	
<data>	Information to be read/written to the SIM (hexadecimal character format). The response of the command is in the format:

+CRSM: <sw1>,<sw2>[,<response>]

where:

<sw1>,<sw2> - information from the SIM about the execution of the actual command either on successful or on failed execution.

<response> - on a successful completion of the previously issued command, it gives the requested data (hexadecimal character format). It's not returned after a successful UPDATE BINARY or UPDATE RECORD command.

Notes

- This command requires PIN authentication. However commands READ BINARY and READ RECORD can be issued before PIN authentication and if the SIM is blocked (after three failed PIN authentication attempts) to access the contents of the Elementary Files.
- Use only decimal numbers for parameters <command>, <fileid>, <P1>, <P2> and <P3>.
- Reference: 3GPP TS 27.007, GSM 11.11

Alert Sound Mode +CALM

Set command selects the general alert sound mode of the device.

Read command returns the current value of parameter <mode>.

Test command returns the supported values for the parameter <mode> as compound value.

+CALM: (0-2)

Syntax

Command	Command type
AT+CALM=<mode>	Set
AT+CALM?	Read
AT+CALM=?	Test

Parameters and Values

<mode>

- | | |
|----------|---|
| 0 | Normal mode. Default: 0. |
| 1 | Silent mode. No sound is generated by the device, except for alarm sound. |
| 2 | Stealth mode. No sound is generated by the device. |
- Note: If silent mode is selected, incoming calls do not produce alerting sounds but only the unsolicited messages RING or +CRING.

Notes

- Reference: 3GPP TS 27.007

Ringer Sound Level +CRSL

Set command selects the incoming call ringer sound level of the device.

Read command reports the current <level> setting of the call ringer in the format:

+CRSL: <level>

Test command reports <level> supported values as compound value.

+CRSL: (0-4)

Syntax

Command	Command type
AT+CRSL=<level>	Set
AT+CRSL?	Read
AT+CRSL=?	Test

Parameters and Values

<level>	Ringer sound level.
0	Off.
1	Low.
2	Middle.
3	High. Default: 3.
4	Progressive.

Notes

- Reference: 3GPP TS 27.007.

Loudspeaker Volume Level +CLVL

Set command selects the volume of the internal loudspeaker audio output of the device.

Read command reports the current <level> setting of the loudspeaker volume in the format:

+CLVL: <level>

Test command reports <level> supported values range in the format:

+CLVL: (0-max)

Syntax

Command	Command type
AT+CLVL=<level>	Set
AT+CLVL?	Read
AT+CLVL=?	Test

Parameters and Values

<level>	Loudspeaker volume
0-max	To read maximum value, issue the test command. Default: 10.

Notes

- Reference: 3GPP TS 27.007.

Microphone Mute Control +CMUT

Set command enables or disables the muting of the microphone audio line during a voice call.

Read command reports whether the muting of the microphone audio line during a voice call is enabled or not, in the format:

+CMUT: <n>

Test command reports the supported values for <n> parameter.

Syntax

Command	Command type
AT+CMUT=<n>	Set
AT+CMUT?	Read
AT+CMUT=?	Test

Parameters and Values

<n>

- 0** Mute off, microphone active. **Default: 0.**
- 1** Mute on, microphone muted.

Note: This command mutes or activates both microphone audio paths, internal mic and external mic.

Notes

- Reference: 3GPP TS 27.007.

Silence Command +CSIL

This command enables or disables the silent mode. When the phone is in silent mode, all signaling tones from MT are suppressed.

Read command reports the currently selected <mode> in the format:

+CSIL: <mode>

Test command reports the supported range of values for <mode>.

Syntax

Command	Command type
AT+CSIL=[<mode>]	
AT+CSIL?	Read
AT+CSIL=?	Test

Parameters and Values

<mode>

- 0** Silent mode off. **Default: 0.**
- 1** Silent mode on.

Available AT Commands +CLAC

Execute command causes the mobile equipment to return the AT commands available to the user, in the following format:

```
<AT cmd1>[<CR><LF><AT cmd2>[...]]
```

where:

<AT cmdn> - defines the AT command including the prefix AT

Test command returns the OK result code

Syntax

Command	Command type
AT+CLAC	Execute
AT+CLAC=?	Test

Notes

- Reference: 3GPP TS 27.007.

Accumulated Call Meter +CACM

Set command resets the Advice of Charge related Accumulated Call Meter stored in SIM (ACM). It contains the number of home units for both the current and preceding calls.

Read command reports the current value of the SIM ACM in the format:

```
+CACM: <acm>
```

where:

<acm> - accumulated call meter in home units, string type: three bytes of the ACM value in hexadecimal format (for example "00001E" indicates decimal value 30)

Note: The value <acm> is in home units; price per unit and currency are defined with command +CPUC

Test command returns the OK result code.

Syntax

Command	Command type
AT+CACM=[<pwd>]	Set
AT+CACM?	Read
AT+CACM=?	Test

Parameters and Values

<pwd> To access this command PIN2. If PIN2 is already input once after startup, it is not required again.

Notes

- Reference: 3GPP TS 27.007.

Accumulated Call Meter Maximum +CAMM

Set command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax). This value represents the maximum number of home units the subscriber is allowed consume. When ACM reaches <acmmax> value, further calls are prohibited.

Read command reports the ACMmax value stored in SIM in the format:

+CAMM : <acmm>

where:

<acmm> - ACMmax value in home units, string type: three bytes of the ACMmax value in hexadecimal format (for example "00001E" indicates decimal value 30)

Test command returns the OK result code.

Syntax

Command	Command type
AT+CAMM=[<acmmax>,<pwd>]]	Set
AT+CAMM?	Read
AT+CAMM=?	Test

Parameters and Values

<acmmax>	ACMmax value, integer type. The maximum number of home units the subscriber can consume. Note: To disable the feature set <acmmax> = 0.
<pwd>	PIN2. If PIN2 is input once after startup, it is not required again.

Notes

- Reference: 3GPP TS 27.007.

Price per Unit and Currency Table +CPUC

Set command sets the values of Advice of Charge related Price per Unit and Currency Table stored in SIM (PUCT). The PUCT information can be used to convert the home units (as used in commands +CAOC, +CACM and +CAMM) into currency units.

Read command reports the current values of <currency> and <ppu> parameters in the format:

+CPUC : <currency>,<ppu>

Test command returns the OK result code.

Syntax

Command	Command type
AT+CPUC=<currency>,<ppu>[,<pwd>]	Set
AT+CPUC?	Read
AT+CPUC=?	Test

Parameters and Values

<currency>	String type. 3-character currency code. For example "LIT", "L. ", "USD", "DEM". Used character set is the one selected with command +CSCS.
<ppu>	String type, price per unit, dot is used as decimal separator. For example "1989.27".
<pwd>	SIM PIN2. If PIN2 is input once after startup, it is not required again.

Notes

- Reference: 3GPP TS 27.007.

Call Meter Maximum Event +CCWE

Set command enabled and disabled sending of an unsolicited result code +CCWV shortly before the ACM (Accumulated Call Meter) maximum value is reached. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 seconds call time remains.

Note: The set command responds with an error if the Accumulated Call Meter service is not active in SIM

Read command reports the currently selected <mode> in the format:

+CCWE: <mode>

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT+CCWE=<mode>	Set
AT+CCWE?	Read
AT+CCWE=?	Test

Parameters and Values

<mode>	
0	Disable call meter warning event. Default: 0.
1	Enable call meter warning event.

Generic SIM Access +CSIM

Between two successive +CSIM commands, the SIM-ME interface must be locked to avoid commands that modify the wrong SIM file. Locking and unlocking the SIM-ME interface must be done explicitly at the beginning and end of the +CSIM sequence.

The ME sends <command> as it is to the SIM. As a response to the command, ME sends back the actual SIM <response> to the TA as it is.

Test command reports OK.

Syntax

Command	Command type
AT+CSIM=<lock>	Execute
AT+CSIM=<length>,<command>	
AT+CSIM?	Read
AT+CSIM=?	Test

Parameters and Values

<lock>

- 1** Locks the interface.
- 0** Unlocks the interface.

<length>

Number of characters sent to the TE in <command> or <response>. Twice the actual length of the command or response.

- 1** Locks the interface.
- 0** Unlocks the interface.

<command>

Command passed on by the ME to the SIM in the format described in GSM 11.11 (hexadecimal character format).

The response of the command is in the format:

+CSIM: <length>,<response>

where:

<response> is the response to the command passed on by the SIM to the ME in the format as described in GSM 11.11 (hexadecimal character format).

Error case:

+CME ERROR: <err>

possible <err> values (numeric format followed by verbose format):

3 operation not allowed (*operation mode is not allowed by the ME, wrong interface lock/unlock status*)

4 operation not supported (*wrong format or parameters of the command*)

13 SIM failure (*SIM no response*)

For the following instructions (value of the second byte):

A4 : SELECT

10 : TERMINAL PROFILE

C2 : ENVELOPE

14 : TERMINAL RESPONSE

A2 : SEEK

The value of <command>'s fifth byte must equal the number of bytes that follow (data starting from 6th byte); this must equal <length>/2 – 5

otherwise, the command is not sent to the SIM and CME_ERROR=4 is returned.

Notes

- If the TE application does not use the unlock command in a certain time, the ME releases the lock.
- After locking the SIM-ME interface (AT+CSIM=1) the SIM is accessible only by AT+CSIM commands (#QSS: 0). GSM and GPRS services are automatically deregistered to avoid TE commands altering the GSM application. They are restored automatically after the SIM-ME interface is unlocked. After unlocking SIM-ME interface, if PIN is required, you will need to enter it.


```
FFFFFFFFFFFFFFFF9000"
OK
Unlock SIM interface
AT+CSIM=0
OK
```

Mobile Equipment Errors

Report Mobile Equipment Error +CMEE

Set command enables or disables the report of result code:

```
+CME ERROR: <err>
```

as an indication of an error relating to the +Cxxx commands issued.

When enabled, device related errors cause the +CME ERROR: <err> result code instead of the default ERROR result code. ERROR is always returned when the error message is related to syntax, invalid parameters, or DTE function.

Read command returns the current value of subparameter <n>:

```
+CMEE: <n>
```

Test command returns the range of values for subparameter <n>

Syntax

Command	Command type
AT+CMEE=[<n>]	Set
AT+CMEE?	Read
AT+CMEE=?	Test

Parameters and Values

<n>	Enable flag.
0	Disable +CME ERROR:<err> reports, use only ERROR report. Default: 0.
1	Enable +CME ERROR:<err> reports, with <err> in numeric format.
2	Enable +CME ERROR: <err> reports, with <err> in verbose format.

Notes

- +CMEE has no effect on the final result code +CMS.
- Reference: 3GPP TS 27.007.

Set CMEE Mode #CMEEMODE

Set command extends the error code set reported by CMEE to the GPRS related error codes.

Read command reports the currently selected <mode>, in the format:

```
+CMEEMODE: <mode>
```

Test command returns the supported values for <mode>.

Syntax

Command	Command type
AT#CMEEMODE=<mode>	Set
AT#CMEEMODE?	Read
AT#CMEEMODE=?	Test

Parameters and Values

<mode>

- 0** Disable support of GPRS related error codes by AT+CEEE. **Default: 0.**
- 1** Enable support of GPRS related error codes by AT+CEEE.

Notes

- This parameter is stored in the user profile.

Voice Control

DTMF Tones Transmission +VTS

Execute command allows users to send DTMF tone sequences.

Test command provides the list of supported <dtmf>s and the list of supported <duration>s in the format:

(list of supported <dtmf>s)[,(list of supported <duration>s)]

Syntax

Command	Command type
AT+VTS=<dtmfstring>[,duration]	Execute
AT+VTS=?	Test

Parameters and Values

<dtmfstring> String of DTMF tones, which are ASCII characters in the set (0-9), #, *, (A-D), P. The string can be 32 characters long. Tone duration is defined through the +VTD command.

<duration> Note: Input <dtmf string> without the double quotation mark ("""). Duration of a tone in 1/100 sec. This parameter can be specified if only one ASCII character is used in the dtmfstring.

0 A single DTMF tone is transmitted for a duration depending on the network, no matter what the current +VTD setting is.

1-255 A single DTMF tone is transmitted for a time <duration>, in 10 ms multiples, no matter what the current +VTD setting is.

Notes

- This command operates in voice mode only. See +FCLASS.
- The P character does not correspond to any DTMF tone, but is interpreted as a 3-second pause between the preceding and succeeding DTMF string elements.
- Reference: 3GPP TS 27.007 and TIA IS-101.

Tone Duration +VTD

Set command sets the length of tones transmitted with +VTS command.

Read command reports the current Tone Duration, in the format:

<duration>

Test command provides the list of supported <duration>s in the format:

(list of supported <duration>s)

Syntax

Command	Command type
AT+VTD=<duration>	Set
AT+VTD?	Read
AT+VTD=?	Test

Parameters and Values

<duration>	Duration of a tone.
0	The duration of every single tone depends on the network. Default: 0.
1-255	Duration of every single tone in 1/10 sec,

Notes

- Reference: 3GPP TS 27.007 and TIA IS-101.

Commands for GPRS

GPRS Mobile Station Class +CGCLASS

Set command sets the GPRS class according to <class> parameter.

Read command returns the current value of the GPRS class in the format:

+CGLASS: <class>

Test command reports the range for the parameter <class>.

Syntax

Command	Command type
AT+CGCLASS=[<class>]	Set
AT+CGCLASS?	Read
AT+CGCLASS=?	Test

Parameters and Values

<class>	GPRS class.
"B"	GSM/GPRS. Default: "B".
"CG"	Class C in GPRS only mode. GPRS only.
"CC"	Class C in circuit switched only mode. GSM only.

Notes

- The setting is saved in non-volatile memory and available after a reboot.

GPRS Attach or Detach +CGATT

Execute command attaches the terminal to or detaches the terminal from the GPRS service depending on the parameter <state>.

Read command returns the current GPRS service state.

Test command requests information on the supported GPRS service states.

Syntax

Command	Command type
AT+CGATT=[<state>]	Execute
AT+CGATT?	Read
AT+CGATT=?	Test

Parameters and Values

<state>	State of GPRS attachment.
0	Detached.
1	Attached.

Notes

- Reference: 3GPP TS 27.007

Examples

AT+CGATT?

+CGATT: 0

OK

AT+CGATT=?

+CGATT: (0, 1)

OK

AT+CGATT=1

OK

GPRS Event Reporting +CGEREP

Set command enables or disables sending of unsolicited result codes +CGEV: XXX from TA to TE in the case of certain events occurring in the TA or the network. For more information, see the section Unsolicited Result Codes.

Read command returns the current <mode> and <bfr> settings, in the format:

+CGEREP: <mode>, <bfr>

Test command reports the supported range of values for the +CGEREP command parameters.

Syntax

Command	Command type
AT+CGEREP=[<mode>[,<bfr>]]	Set
AT+CGEREP?	Read
AT+CGEREP=?	Test

Parameters and Values

- <mode>** Controls the processing of URCs specified with this command.
- 0** Buffer unsolicited result codes in the TA. If TA result code buffer is full, the oldest one can be discarded. No codes are forwarded to the TE.
 - 1** Discard unsolicited result codes when TA-TE link is reserved (for example 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 (for example in on-line data mode) and flush them to the TE when TA-TE link becomes available; otherwise forward them directly to the TE.
- <bfr>** Controls the effect on buffered codes when <mode> 1 or 2 is entered:
- 0** TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 or 2 is entered.
 - 1** TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered. OK response is given before flushing codes.

Unsolicited Result Codes

The following unsolicited result codes and the corresponding events are defined:

- **+CGEV: REJECT <PDP_type>, <PDP_addr>**
A network request for PDP context activation occurred when the TA was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.
- **+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]**
The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to TA.
- **+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]**
The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to TA.
- **+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]**
The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to TA.
- **+CGEV: NW DETACH**
The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.
- **+CGEV: ME DETACH**
The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.

■ **+CGEV: ME CLASS <class>**

The mobile equipment has forced an MS class change. The highest available class is reported, see +CGCLASS.

Notes

- Reference: 3GPP TS 27.007.

GPRS Network Registration Status +CGREG

Set command controls the presentation of an unsolicited result code +CGREG:. For more information about the result codes, see the section Unsolicited Result Codes.

Read command returns the status of result code presentation mode <n> and the integer <stat>, which shows whether the network has currently indicated the registration of the terminal in the format:

+CGREG: <n>,<stat>[,<lac>,<ci>]

Note: <lac> and <ci> are reported only if <mode>=2 and the mobile is registered on some network cell.

Test command returns supported values for parameter <n>.

Syntax

Command	Command type
AT+CGREG=[<n>]	Set
AT+CGREG?	Read
AT+CGREG=?	

Parameters and Values

<n>	Result code presentation mode.
0	Disable network registration unsolicited result code.
1	Enable network registration unsolicited result code.

Unsolicited Result Codes

If there is a change in the terminal GPRS network registration status, it is issued the unsolicited result code:

+CGREG: <stat>

where:

<stat>	Registration status.
0	Not registered, terminal is not currently searching for a new operator to register with.
1	Registered, home network.
2	Not registered. Terminal is currently searching for a new operator to register with.
3	Registration denied.
4	Unknown.
5	Registered, roaming.

Enable network registration and location information unsolicited result code; if there is a change of the network cell, it is issued the unsolicited result code:

+CGREG: <stat>[,<lac>,<ci>]

where:

<stat>	Registration status.
<lac>	Location area code in hexadecimal format. For example, "00C3" equals 195 in decimal.
<ci>	Cell ID in hexadecimal format.

Note: <lac> and <Ci> are reported only if <mode>=2 and the mobile is registered on some network cell.

Notes

- Reference: 3GPP TS 27.007.

Define PDP Context +CGDCONT

Set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

Read command returns the current settings for each defined context in the format:

```
+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,pdN]]] [<CR><LF>
+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,pdN]]][...]
```

Test command returns values supported as a compound value.

Syntax

Command	Command type
AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<pd1>[,...[,pdN]]]]]]]]]	Set
AT+CGDCONT?	Read
AT+CGDCONT=?	Test

Parameters and Values

<cid>	PDP Context Identifier. Numeric parameter that specifies a PDP context definition.
1-max	The value of max is returned by the test command. Note: A special form of the set command, +CGDCONT=<cid>, causes the values for context number <cid> to become undefined.
<PDP_type>	Packet Data Protocol type. String parameter that specifies the type of packet data protocol.
"IP"	Internet Protocol.
"IPV6"	Internet Protocol version 6.
<APN>	Access Point Name. String parameter that is a logical name used to select the GGSN or the external packet data network. If the value is empty ("") or omitted, then the subscription value is requested.
<PDP_addr>	String parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the +CGPADDR command.

<d_comp>	Numeric parameter that controls PDP data compression
0	Off. If value is omitted, default: 0 .
1	On.
<h_comp>	Numeric parameter that controls PDP header compression
0	Off. If value is omitted, default: 0 .
1	On.
<pd1>, ..., <pdN>	Zero to N string parameters whose meanings are specific to the <PDP_type>

Notes

- Reference: 3GPP TS 27.007

Examples

```
AT+CGDCONT=1,"IP","APN","10.10.10.10",0,0
```

```
OK
```

```
AT+CGDCONT?
```

```
+CGDCONT: 1,"IP","APN","10.10.10.10",0,0
```

```
OK
```

```
AT+CGDCONT=?
```

```
+CGDCONT: (1-5),"IP",,,(0,1),(0,1)
```

```
+CGDCONT: (1-5),"IPV6",,,(0,1),(0,1)
```

```
OK
```

Quality of Service Profile +CGQMIN

Set command specifies a minimum acceptable profile that is checked by the terminal against the negotiated profile returned in the Activate PDP Context Accept message.

Read command returns the current settings for each defined context in the format:

```
+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>+CGQMIN:
<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]
```

If no PDP context is defined, it has no effect and OK result code is returned.

Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

```
+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)
```

Note: Only the "IP" <PDP_Type> is currently supported.

Syntax

Command	Command type
AT+CGQMIN=[<cid>,<precedence>[,<delay>,<reliability>,<peak>,<mean>]]]	Set
AT+CGQMIN?	Read
AT+CGQMIN=?	Test

Parameters and Values

<cid>	PDP context identification. See +CGDCONT command.
<precedence>	Precedence class.
<delay>	Delay class.
<reliability>	Reliability class.
<peak>	Peak throughput class.
<mean>	Mean throughput class.

Note: If a value is omitted for a particular class then this class is not checked.

Notes

- A special form of the set command, +CGQMIN=<cid> causes the requested profile for context number <cid> to become undefined.
- Set command can modify the 3G QoS according to 3GPP 23.107. See +CGEQMIN.
- Reference: 3GPP TS 27.007; GSM 03.60

Examples

```
AT+CGQMIN=1,0,0,3,0,0
```

```
OK
```

```
AT+CGQMIN?
```

```
+CGQMIN: 1,0,0,5,0,0
```

```
OK
```

```
AT+CGQMIN=?
```

```
+CGQMIN: "IP", (0-3), (0-4), (0-5), (0-9), (0-18,31)
```

```
OK
```

Quality of Service Profile +CGQREQ

Set command allows users to specify a Quality of Service Profile that is used when the terminal sends an Activate PDP Context Request message to the network. It specifies a profile for the context identified by the (local) context identification parameter, <cid>.

Read command returns the current settings for each defined context in the format:

```
+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>+CGQREQ:
<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]
```

If no PDP context is defined, it has no effect and OK result code is returned.

Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

```
+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)
```

Note: Only the "IP" <PDP_Type> is currently supported.

Syntax

Command	Command type
AT+CGQREQ=[<cid>[,<precedence>,<delay>,<reliability>[,<peak>[,<mean>]]]]]	Set
AT+CGQREQ?	Read
AT+CGQREQ=?	Test

Parameters and Values

<cid>	PDP context identification. See +CGDCONT command.
<precedence>	Precedence class.
<delay>	Delay class.
<reliability>	Reliability class.
<peak>	Peak throughput class.
<mean>	Mean throughput class.

Note: If a value is omitted for a particular class then this class is not checked.

Notes

- A special form of the set command, +CGQREQ=<cid> causes the requested profile for context number <cid> to become undefined.
- Set command can modify the 3G QoS according to 3GPP 23.107. See +CGEQREQ.
- Reference: 3GPP TS 27.007; GSM 03.60.

Examples

```
AT+CGQREQ?
+CGQREQ: 1,0,0,3,0,0
OK
AT+CGQREQ=1,0,0,3,0,0
OK
AT+CGQREQ=?
+CGQREQ: "IP", (0-3), (0-4), (0-5), (0-9), (0-18,31)
OK
```

PDP Context +CGACT

Execute command activates or deactivates the specified PDP contexts.

Read command returns the current activation state for all the defined PDP contexts in the format:

```
+CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>[...]]
```

Test command reports information on the supported PDP context activation states parameters in the format:

```
+CGACT: (0,1)
```

Syntax

Command	Command type
AT+CGACT=[<state>,<cid>[,<cid>[,...]]]	
AT+CGACT?	Read
AT+CGACT=?	

Parameters and Values

<state>	Indicates the state of PDP context activation.
0	Deactivated
1	Activated
<cid>	Numeric parameter that specifies a PDP context definition. See +CGDCONT.

Note: If no <cid>s are specified the activation/deactivation form of the command activates/deactivates all defined contexts.

Notes

- Reference: 3GPP TS 27.007

Examples

```
AT+CGACT=1,1
```

```
OK
```

```
AT+CGACT?
```

```
+CGACT: 1,1
```

```
OK
```

Show PDP Address +CGPADDR

Execute command returns a list of PDP addresses for the specified context identifiers in the format:

```
+CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>,<PDP_addr>[...]]
```

Test command returns a list of defined <cid>s.

Syntax

Command	Command type
AT+CGPADDR=[<cid>[,<cid>[,...]]]	Execute
AT+CGPADDR=?	Test

Parameters and Values

<cid>	A numeric parameter, which specifies a particular PDP context definition (see +CGDCONT command). If <cid> is not specified, returns the addresses for all defined contexts.
<PDP_addr>	A string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. The static address is the one set by +CGDCONT when the context was defined. The dynamic address is the one assigned during the last PDP context activation that used the context definition referred to by <cid>. If no address is available the empty string ("") is represented as <PDP_addr>.

Notes

- Reference: 3GPP TS 27.007

Examples

```
AT#GPRS=1
```

```
+IP: xxx.yyy.zzz.www
```

```
OK
```

```
AT+CGPADDR=1
```

```
+CGPADDR: 1, "xxx.yyy.zzz.www"
```

```
OK
```

```
AT+CGPADDR=?
```

```
+CGPADDR: (1)
```

```
OK
```

Enter Data State +CGDATA

Execute command performs actions necessary to establish network communication using one or more GPRS PDP types.

Test command reports information on the supported layer 2 protocols.

Syntax

Command	Command type
AT+CGDATA=[<L2P>,[<cid>[,<cid>[,...]]]]	Execute
AT+CGDATA=?	Test

Parameters and Values

<L2P>	String parameter that indicates the layer 2 protocol to be used.
PPP	Point-to-point protocol.
<cid>	Numeric parameter that specifies a particular PDP context definition (see +CGDCONT command).

Notes

- If parameter <L2P> is omitted, the layer 2 protocol is unspecified.
- Reference 3GPP TS 27.007.

Example

```
AT+CGDATA=?
```

```
+CGDATA: ("PPP")
```

```
OK
```

```
AT+CGDATA="PPP",1
```

```
CONNECT
```

Modify PDP Context +CGCMOD

The Execute command modifies the specified PDP context(s) with respect to QoS profiles.

If no <cid> is specified the command modifies all active contexts.

Test command returns a list of <cid>s associated with active contexts.

Syntax

Command	Command type
AT+CGCMOD=[<cid1>[,<cid2>[,...,<cidN>]]]	Execute
AT+CGCMOD=?	Test

Parameters and Values

<cid> Numeric parameter, which specifies a particular PDP context.

Commands for Battery Charger

Battery Charge +CBC

Execution command returns the current battery charge status in the format:

+CBC: <bcs>,<bcl>

where:

<bcs>	Battery status
0	ME is powered by the battery.
1	ME has a battery connected and the charger pins are being powered.
2	ME does not have a battery connected.
3	Recognized power fault, calls inhibited.
<bcl>	Battery charge level
0	Battery is exhausted or the ME does not have a battery connected.
25	Remaining battery charge is estimated to be 25%.
50	Remaining battery charge is estimated to be 50%.
75	Remaining battery charge is estimated to be 75%.
100	Battery is fully charged.

Test command returns parameter values supported as a compound value.

+CBC: (0-3),(0-100)

Syntax

Command	Command type
AT+CBC	Set
AT+CBC=?	Test

Notes

- <bcs>=1 indicates the battery charger is attached and the battery is being charged with it if necessary. Supply for ME operations is taken from the VBATT pins.
- Without battery/power connected on VBATT pins or during a power fault the unit does not work and values <bcs>=2 and <bcs>=3 will not appear.
- <bcl> indicates battery charge level only if battery is connected and charger is not connected.
- The ME does not make differences between being powered by a battery or by a power supply on the **VBATT** pins, so it is not possible to distinguish between these two cases.
- Reference: 3GPP TS 27.007.

Example

AT+CBC

+CBC: 0,75

OK

3GPP TS 27.005 AT Commands for SMS and CBS

General Configuration

Select Message Service +CSMS

Set command selects messaging service <service>. It returns the types of messages supported by the ME:

```

+CSMS: <mt>,<mo>,<bm>

```

Read command reports current service setting along with supported message types in the format:

```

+CSMS: <service>,<mt>,<mo>,<bm>

```

where:

<service>	Messaging service.
<mt>	Mobile terminated messages support.
<mo>	Mobile originated messages support.
<bm>	Broadcast type messages support.
For more information about these values, see the Values section for the set command.	
<mt>	Mobile terminated messages support.
0	Type not supported.
1	Type supported.
<mo>	Mobile originated messages support.
0	Type not supported.
1	Type supported.
<bm>	Broadcast type messages support.
0	Type not supported. Default: 0.
1	Type supported.

Test command reports the supported value of the parameter <service>.

Syntax

Command	Command type
AT+CSMS=<service>	Set
AT+CSMS?	Read
AT+CSMS=?	Test

Parameters and Values

<service>	
0	The syntax of SMS AT Commands is compatible 3GPP TS 27.005. Default: 0.

Notes

- Reference: GSM TS 27.005; 3GPP TS 23.040; 3GPP TS 23.041.

Example

```

AT+CSMS=?
+CSMS: ( 2 )
OK
AT+CSMS=2
+CSMS: 1,1,0
OK
AT+CSMS?
+CSMS: 2,1,1,0
OK

```

Preferred Message Storage +CPMS

+CPMS behavior depends on whether or not you have enabled improved SMS commands with #SMSMODE.

Set command selects memory storages <memr>, <memw>, and <mems> to be used for reading, writing, sending and storing SMS messages. The command returns memory storage in the format:

+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>, <totals>

where:

<usedr>	Number of SMS stored in <memr>.
<totalr>	Number of SMS that <memr> can contain.
<usedw>	Number of SMS stored in <memw>.
<totalw>	Number of SMS that <memw> can contain.
<useds>	Number of SMS stored in <mems>.
<totals>	Number of SMS that <mems> can contain.

Read command reports the message storage status in the format:

+CPMS: <memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>,<mems>,<useds>,<totals>

where <memr>, <memw>, and <mems> are the selected storage memories for reading, writing and storing respectively.

Test command reports the supported values for <memr>,<memw>, and <mems>.

Syntax

Command	Command type
AT+CPMS=<memr>[,<memw>[,<mems>]]	Set
AT+CPMS?	Read
AT+CPMS=?	Test

Parameters and Values

<memr>	Memory from which messages are read and deleted.
"SM"	SIM SMS memory storage.
"ME"	SMS internal storage.
<memw>	Memory to which writing and sending operations are made.
"SM"	SIM SMS memory storage.
<mems>	Memory where received SMS are stored.
"SM"	SIM SMS memory storage.

Notes

- Use the read command to determine if ME storage is sufficient for your application. SIM has greater storage capacity.
- If SMSMODE=0:
 - The received Class 0 SMS are stored in the ME memory regardless of the <mems> setting and they are automatically deleted at power off.
 - The only supported memory storage for writing and sending SMS is the SIM internal memory SM, so <memw>=<mems>="SM".
- If SMSMODE=1:
 - The only supported memory storage for reading, writing and sending SMS is the SIM internal memory SM, so <memr>=<memw>=<mems>="SM".
- Reference: GSM 27.005

Example

AT+CPMS?

+CPMS: "SM",5,10,"SM",5,10,"SM",5,10

OK

(you have 5 out of 10 SMS SIM positions occupied)+CPMS: 5,99,5,99

Message Format +CMGF

Set command selects the format of messages used with send, list, read and write commands.

Read command reports the current value of the parameter <mode>.

Test command reports the supported value of <mode> parameter.

Syntax

Command	Command type
AT+CMGF=<mode>	Set
AT+CMGF?	Read
AT+CMGF=?	Test

Parameters and Values

<mode>	
0	PDU mode, as defined in GSM 3.40 and GSM 3.41. Default: 0.
1	Text mode.

Notes

- Reference: GSM 27.005

Example

AT+CMGF=1

OK

Message Configuration

Service Center Address +CSCA

Set command sets the service center address (SCA) used for mobile originated SMS transmissions.

Read command reports the current value of the SCA in the format:

+CSCA: <number>[,<type>]

Note: If SCA is not present, the device reports an error message.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CSCA=<number>[,<type>]	Set
AT+CSCA?	Read
AT+CSCA=?	Test

Parameters and Values

<number>	SC phone number in the format defined by <type>.
<type>	Type of number.
129	National numbering scheme.
145	International numbering scheme. Contains the character "+".

Notes

- To use the SM service, you must set a Service Center Address to which service requests are directed.
- In text mode, send and write commands use this setting. In PDU mode, the same commands use this setting, but only when the length of the SMSC address coded into the <pdu> parameter equals zero.
- The current settings are stored through +CSAS.
- If SCA is not present, the device reports an error message.
- Reference: GSM 27.005.

Set Text Mode Parameters +CSMP

+CSMP parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Set command selects values for additional parameters for storing and sending SMS when text mode is used (AT+CMGF=1).

Read command reports the current setting in the format:

+CSMP: <fo>,<vp>,<pid>,<dc>

Note: If #SMSMODE=1, if the Validity Period Format (<fo>'s bit[4]bit[3]) is [00] (i.e. *Not Present*), <vp> is represented just as a quoted empty string ("").

Test command returns the OK result code.

Syntax

Command	Command type
AT+CSMP=[<fo>,<vp>,<pid>,<dc>]]]	Set
AT+CSMP?	Read
AT+CSMP=?	Test

Parameters and Values if #SMSMODE=0

<fo>

First octet of 3GPP TS 23.040 SMS-SUBMIT in integer format (default 17, i.e. SMS-SUBMIT with validity period in relative format). As first octet of a PDU has the following bit field description (we'll refer to bit[7]bit[6]bit[5]bit[4]bit[3]bit[2]bit[1]bit[0]):
bit[1]bit[0]: Message Type Indicator, 2-bit field describing the message type: all the combinations are converted in [01] (default is [01]);

bit[1]bit[0]: Message Type Indicator, 2-bit field describing the message type: all the combinations are converted in [01] (default is [01]);

[00] - converted in [01]

[01] - SMS-SUBMIT

[10] - converted in [01]

[11] - converted in [01]

bit[2]: Reject Duplicates, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[4]bit[3]: Validity Period Format, 2-bit field indicating whether or not the Validity Period field is present (default is [10]):

[00] - Validity Period field *not present*

[01] - Validity Period field present in *enhanced format*: it is currently converted in [00], i.e. *not present*

[10] - Validity Period field present in *relative format*, (i.e. integer type, see below)

[11] - Validity Period field present in *absolute format* (i.e. quoted time-string type); we strongly suggest to not use this format because its implementation is currently under refinement

bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report (default is [0]);

[0] - MS is not requesting a status report

[1] - MS is requesting a status report

bit[6]: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[7]: Reply Path, 1-bit field indicating the request for Reply Path (default is [0]);

[0] - Reply Path not requested

[1] - Reply Path requested

<vp>

Depends on <fo> setting:

If <fo> asks for a Validity Period in *relative format* <vp> shall be integer type (default 167, i.e. 24 hours);

If <fo> asks for a Validity Period in *absolute format* we strongly suggest to modify it in *relative format*, because the implementation of this topic is currently under refinement and it is currently not possible to set <vp> with a quoted time string type.

(for *relative format* only:)

0..143 - (<vp> + 1) x 5 minutes;
 144..167 - 12 hours + ((<vp> - 143) x 30 minutes);
 168..196 - (<vp> - 166) x 1 day;
 197..255 - (<vp> - 192) x 1 week;

<pid>

3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).

<dc>

Depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme

Parameters and Values if #SMSMODE=1

<fo>

First octet of 3GPP TS 23.040 SMS-SUBMIT or SMS-DELIVER, in integer format (default 17, i.e. SMS-SUBMIT with validity period in relative format). As first octet of a PDU has the following bit field description (bit[7]bit[6]bit[5]bit[4]bit[3]bit[2]bit[1]bit[0]):

bit[1]bit[0]: Message Type Indicator, 2-bit field describing the message type;
 [00] - SMS-DELIVER;
 [01] - SMS-SUBMIT (default) ;

bit[2]: Reject Duplicates, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[4]bit[3]: Validity Period Format, 2-bit field indicating whether or not the Validity Period field is present (default is [10]):

[00] - Validity Period field *not present*
 [01] - Validity Period field present in *enhanced format* (i.e. quoted time-string type, see below)
 [10] - Validity Period field present in *relative format*, (i.e. integer type, see below)
 [11] - Validity Period field present in *absolute format* (i.e. quoted time-string type, see below)

bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report (default is [0]);

[0] - MS is not requesting a status report
 [1] - MS is requesting a status report

bit[6]: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[7]: Reply Path, 1-bit field indicating the request for Reply Path (default is [0]);

[0] - Reply Path not requested
 [1] - Reply Path requested

<vp>

Depends on <fo> setting.

a. If <fo> asks for a *Not Present* Validity Period, <vp> can be any type and it will be not considered;

b. If <fo> asks for a Validity Period in *relative format*, <vp> shall be integer type (default 167, i.e. 24 hours);

0..143 - (<vp> + 1) x 5 minutes
 144..167 - 12 hours + ((<vp> - 143) x 30 minutes)

168..196 - (<vp> - 166) x 1 day
 197..255 - (<vp> - 192) x 1 week

c. If <fo> asks for a Validity Period in *absolute format*, <vp> shall be quoted time-string type (see +CCLK); this is the only admitted format if <fo> value defines SMS-DELIVER as message type

d. If <fo> asks for a Validity Period in *enhanced format*, <vp> shall be the quoted hexadecimal representation (string type) of 7 octets, as follows:

The first octet is the **Validity Period Functionality Indicator**, indicating the way in which the other 6 octets are used; let's consider its bit field description:

bit[7]: extension bit

[0] - there are no more VP Functionality Indicator extension octets to follow

bit[6]: Single Shot SM;

[0] - the SC is not required to make up to one delivery attempt

[1] - the SC is required to make up to one delivery attempt

bit[5]bit[4]bit[3]: reserved

[000]

bit[2]bit[1]bit[0]: Validity Period Format

[000] - No Validity Period specified

[001] - Validity Period specified as for the relative format. The following octet contains the VP value as described before; all the other octets are 0's.

[010] - Validity Period is relative in integer representation. The following octet contains the VP value in the range 0 to 255, representing 0 to 255 seconds; all the other octets are 0's.

[011] - Validity Period is relative in semi-octet representation. The following 3 octets contain the relative time in Hours, Minutes and Seconds, giving the length of the validity period counted from when the SMS-SUBMIT is received by the SC; all the other octets are 0's.

<pid>

3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).

<dc>

Depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme

Notes

- Note: <vp>, <pid> and <dc> default values are loaded from first SIM *SMS Parameters* profile, if present. If it is not present, then the default values are those above indicated.
- Use +CSAS to store current settings.
 - If #SMSMODE=1, the <vp> value is also stored through +CSAS, but only as integer type (only in its *relative format*).
- Reference: GSM 27.005; 3GPP TS 23.040; 3GPP TS 23.038.

Example with #SMSMODE=0

Set the parameters for an outgoing message with 24 hours of validity period and default properties:

AT+CSMP=17,167,0,0

OK

Example with #SMSMODE=1

Set the parameters for an outgoing message with 24 hours of validity period and default properties:

```
AT+CSMP=17,167,0,0
```

OK

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 24 hours of validity period.

```
AT+CSMP=9,"01A80000000000"
```

OK

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 60 seconds of validity period.

```
AT+CSMP=9,"023C0000000000"
```

OK

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 29 hours 85 minutes 30 seconds of validity period.

```
AT+CSMP=9,"03925803000000"
```

OK

Show Text Mode Parameters +CSDH

Set command controls whether detailed header information is shown in text mode (AT+CMGF=1) result codes.

Read command reports the current setting in the format:

```
+CSDH:<show>
```

Test command reports the supported range of values for parameter <show>.

Syntax

Command	Command type
AT+CSDH=[<show>]	Set
AT+CSDH?	Read
AT+CSDH=?	Test

Parameters and Values

<show>

- | | |
|----------|--|
| 0 | Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode. For SMS-COMMANDs in +CMGR result code do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>. Default: 0. |
| 1 | Show the values in result codes. |

Notes

- Reference: GSM 27.005.

Example

```
AT+CSDH?
+CSDH: 0
OK
AT+CSDH=?
+CSDH: (0,1)
OK
AT+CMGR=1
+CMGR: "REC READ", "+17637425060", "", "12/07/31,12:09:01-20"
SMS Message Test
OK
AT+CSDH=1
OK
AT+CMGR=1
+CMGR: "REC READ", "+17637425060", "", "12/07/31,12:09:01-20",145,4,0,0,"+14044550009",145,17
SMS Message Test
OK
```

Select Cell Broadcast +CSCB

Set command selects which types of Cell Broadcast Messages the device receives.

Read command reports the current value of parameters <mode>, <mids> and <dcss>.

Test command returns the range of values for parameter <mode>.

Syntax

Command	Command type
AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	Set
AT+CSCB?	Read
AT+CSCB=?	Test

Parameters and Values

- <mode>

0

1

The message types defined by <mids> and <dcss> are accepted. **Default: 0.**
The message types defined by <mids> and <dcss> are rejected.
- <mids>

String type, message Identifiers: all different possible combinations of the CBM message identifiers. **Default: empty string ("").**
- <dcss>

String type, Data Coding Schemes, all different possible combinations of CBM data coding schemes. **Default: empty string ("").**

Notes

- Current settings are stored through +CSAS.
- Reference: GSM 27.005, 3GPP TS 23.041, 3GPP TS 23.038.

Examples

AT+CSCB?

+CSCB: 1, "", ""

OK (all CBMs are accepted, none is rejected)

AT+CSCB=0, "0,1,300-315,450", "0-3"

OK

Save Settings +CSAS

Execute command saves settings—made by +CSCA, +CSMP, and +CSCB—in local, non-volatile memory.

Test command returns the possible range of values for <profile>.

Syntax

Command	Command type
AT+CSAS[=<profile>]	Execute
AT+CSAS=?	Test

Parameters and Values

<profile>

- 0** Settings saved to non-volatile memory. **Default: 0.**
- 1-n** SIM profile number. The value of n depends on the SIM; 3 is the maximum value.

Notes

- The SIM may not support certain settings. Regardless of the <profile> value, they are always saved to the non-volatile memory.
- If parameter is omitted the settings are saved to profile 0 in non-volatile memory.
- +CSCB <mids> (Message Identifiers) parameter can be saved to SIM only if the “Cell broadcast message identifier selection” file is present on the SIM. If present, this file has storage for only a single data set. It is not possible to save different <mids> in different SIM profiles. Once changed and saved, the <mids> value is the same for all SIM profiles.
- Reference: GSM 27.005

Example

AT+CSAS=?

+CSAS: (0-3)

OK

AT+CSAS

OK

AT+CSAS=1

OK

AT+CSAS=0

OK

Restore Settings +CRES

Execute command restores message service settings saved by +CSAS from either non-volatile memory or SIM.

Test command returns the possible range of values for <profile>.

Syntax

Command	Command type
AT+CRES[=<profile>]	Execute
AT+CRES=?	Test

Parameters and Values

<profile>

0

Restores message service settings from non-volatile memory.

1-n

Restores message service settings from SIM. The value of n depends on the SIM; 3 is the maximum value.

Notes

- The SIM may not support certain settings. Regardless of the <profile> value, they are always saved to the non-volatile memory.
- If parameter is omitted the command restores message service settings from non-volatile memory.
- Reference: GSM 27.005.

Example

AT+CRES=?

+CRES: (0 , 3)

OK

AT+CRES=0

OK

AT+CRES=1

OK

Message Receiving and Reading

New Message Indications to Terminal Equipment +CNMI

+CNMI parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Set command selects device behavior on how receiving new messages from the network are indicated to the DTE.

Read command returns the current parameter settings for +CNMI command in the form:

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

Test command reports the supported value ranges for the +CNMI parameters.

Syntax

Command	Command type
AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	Set
AT+CNMI?	Read
AT+CNMI=?	Test

Parameters and Values

- Use PDU mode when the device is set to PDU mode by AT+CMGF=0.
- Use Text mode when the device is set to PDU mode by AT+CMGF=1.

- <mode>** Unsolicited result codes buffering option.
- 0** Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in another place or the oldest indications may be discarded and replaced with the new received indications. **Default: 0.**
 - 1** When TA-TE link is reserved, discard indication and reject newly received message unsolicited result codes. Otherwise, forward them directly to the TE.
 - 2** Buffer unsolicited result codes in the TA in case the DTE is busy and flush them to the TE after reservation. Otherwise, forward them directly to the TE.
 - 3** if <mt>= 1 an indication via 100 ms break is issued when a SMS is received while the module is in GPRS online mode. It enables the hardware ring line for 1 s. too.
- <mt>** Result code indication reporting for SMS-DELIVER.
- 0** No SMS-DELIVER indications are routed to the TE.
If #SMSMODE=1, messages are stored in SIM. **Default: 0.**
 - 1** If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the following unsolicited result code:
+CMTI: <mems>,<index>

where:

- <mems> - memory storage where the new message is stored (see +CPMS)
- <index> - location on the memory where SMS is stored.

- 2** SMS-DELIVERs (except class 2 messages and messages in the “store” message waiting indication group) are routed directly to the TE using the following unsolicited result code:

PDU Mode

+CMT: <alpha>,<length><CR><LF><pdu>

where:

<alpha> - alphanumeric representation of originator/destination number corresponding to the entry found in MT phonebook; used character set should be the one selected with command +CSCS.

<length> - PDU length

<pdu> - PDU message

Text Mode

+CMT:<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data>
(the information written in italics will be present depending on +CSDH last setting)

where:

<oa> - originating address, string type converted in the currently selected character set (see +CSCS)

<alpha> - alphanumeric representation of <oa>; used character set should be the one selected with command +CSCS.

<scts> - arrival time of the message to the SC

<tooa>,<tosca> - type of number <oa> or <sca>:

129 - number in national format

145 - number in international format (contains the "+")

<fo> - first octet of 3GPP TS 23.040

<pid> - Protocol Identifier

<dcsc> - Data Coding Scheme

<sca> - Service Centre address, string type, converted in the currently selected character set (see +CSCS)

<length> - text length

<data> - TP-User-Data

- If <dcsc> indicates that GSM03.38 default alphabet is used and <fo> indicates that GSM03.40 TP-User-Data-Header-Indication is not set (bit 6 of <fo> is 0), each character of GSM alphabet will be converted into current TE character set (see +CSCS)

- If <dcsc> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that GSM03.40 TP-User-Data-Header-Indication is set (bit 6 of <fo> is 1), each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)

Class 2 messages and messages in the "store" message waiting indication group 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 data coding schemes result in indication as defined in <mt>=1.

<bm> Broadcast reporting option

- 0 Cell Broadcast Messages are not sent to the DTE. **Default: 0.**

- 2 New Cell Broadcast Messages are sent to the DTE with the unsolicited result code:

PDU Mode

If #SMSMODE=0:

+CBM: <PDU>

If #SMSMODE=1:

+CBM: <length><CR><LF><PDU>

where:

<PDU> - message PDU

where:

<length> - PDU length

<PDU> - message PDU

Text Mode

For either **#SMSMODE=0** or **#SMSMODE=1**:

+CBM:<sn>,<mid>,<dc>,<pag>,<pags><CR><LF><data>

where:

<sn> - message serial number

<mid> - message ID

<dc> - Data Coding Scheme

<pag> - page number

<pags> - total number of pages of the message

<data> - CBM Content of Message

- If <dc> indicates that GSM03.38 default alphabet is used, each character of GSM alphabet will be converted into current TE character set (see +CSCS)

- If <dc> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)

<ds>

SMS-STATUS-REPORTs reporting option.

0

If **#SMSMODE=0**: Status report receiving is not reported to the DTE.

If **#SMSMODE=1**: Status report receiving is not reported to the DTE and is not store. **Default: 0.**

1

If **#SMSMODE=0**: Status report is stored and sent to the DTE with the following unsolicited result code:

PDU Mode

+CDS: <length><CR><LF><PDU>

where:

<length> - PDU length

<PDU> - message PDU

Text Mode

+CDS: <fo>,<mr>,,,<scts>,<dt>,<st>

where:

<fo> - first octet of the message PDU

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format

<scts> - arrival time of the message to the SC

<dt> - sending time of the message

<st> - message status as coded in the PDU

If **#SMSMODE=1**: Status report is sent to the DTE with the following unsolicited result code:

PDU Mode

+CDS: <length><CR><LF><PDU>

where:

<length> - PDU length

<PDU> - message PDU

Text Mode

+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>

where:

<fo> - first octet of the message PDU

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format

<ra> - recipient address, string type, represented in the currently selected character set (see +CSCS)

<tor> - type of number <ra>

<scts> - arrival time of the message to the SC

<dt> - sending time of the message

<st> - message status as coded in the PDU

2 If a status report is stored, the following unsolicited result code is sent:

+CDSI: <memr>,<index>

where:

<memr> - memory storage where the new message is stored "SM".

<index> - location on the memory where SMS is stored.

<bfr>

Buffered result codes handling method.

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). **Default: 0.**

1 TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1..3 is entered.

Notes

- DTR signal is ignored, so the indication is sent even if DTE is inactive (DTR signal is Low). In this case, the unsolicited result code may be lost. If MODULE remains active while DTE is not, at DTE startup, check whether new messages have reached the device with AT+CMGL=0 (lists the new messages received).
- Reference GSM 27.005.
- **For #SMSMODE=1 only:**
 - It has been necessary to take the following decisions to get over any incoherence problem in a multiplexed environment (see +CMUX), due to the possibility to have contemporaneous different settings of parameter <mt> in different sessions:

Message Class or Indication group, as in the DCS <mt> settings in different sessions	SM Class is No Class OR SM Class is 0 or 1 or 3 OR SM is an Indication with group "Discard"	SM Class is 3
<mt>=2 for session "0" AND <mt>=anyvalue for other session(s)	URC is shown only on session "0"	
<mt>=3 for session "0" AND <mt>=0 or 1 for other session(s)		URC is shown only on session "0"

The URC behavior in all the other cases follows rules reported on below table concerning <mt> parameter. Storing and acknowledgement on the other hand follow rules specified on instance 0.

- The following table clarifies which URC is shown and, if the DELIVER SM is stored, depending on the <mt> parameter value and the SM class.

SM CLASS						
		0 / msg waiting discard	1 / no class	2	3	msg waiting store
<mt>	0	Store in <mems>	Store in <mems>	Store in SIM	Store in <mems>	Store in <mems>
	1	Store in <mems> - Send ind +CMTI	Store in <mems> - Send ind +CMTI	Store in SIM - Send ind +CMTI	Store in <mems> - Send ind +CMTI	Store in <mems> - Send ind +CMTI
	2	Route msg to TE: +CMT ¹	Route msg to TE: +CMT ¹	Store in SIM - Send ind +CMTI	Route msg to TE: +CMT ¹	Store in <mems> - Send ind +CMTI
	3	Store in <mems> - Send ind +CMTI	Store in <mems>- Send ind +CMTI	Store in SIM - Send ind +CMTI	Route msg to TE: +CMT ¹	Store in <mems> - Send ind +CMTI

<mems> is the memory where the received messages are stored (see +CPMS).

¹ The SM is not stored.

- It is possible to simultaneously have different settings for <ds> in different sessions. With this possibility, the following decision is needed to get past an incoherence problem (see +CMUX) in a multiplexed environment:

<ds> settings in different sessions	
<ds>=1 for session "0" AND <ds>=2 for at least one of the other sessions	URC +CDS is shown only on session "0" and no status report is stored on SIM
<ds>=0 for session "0" AND <ds>=2 for at least one of the other sessions	no URC is shown on any session and no status report is stored on SIM

List Messages +CMGL

+CMGL parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Execute command reports the list of all the messages with status value <stat> stored into <memr> message storage. <memr> is the message storage for read and delete SMs as last settings of command +CPMS.

The parameter type and the command output depend on the last settings of command +CMGF (message format to be used).

Test command returns a list of supported <stat>s.

Syntax

Command	Command type
AT+CMGL[=<stat>]	Execute
AT+CMGL=?	Test

Parameters and Values PDU Mode

PDU mode is used when the device is set to PDU mode by command AT+CMGF=0.

<stat>

- 0** New message.
- 1** Read message.
- 2** Stored message not yet sent.
- 3** Stored message already sent.
- 4** All messages.

If there is at least one message to be listed the representation format is:

```
+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[<CR><LF>
+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[...]]
```

where:

<index> - message position in the memory storage list.

<stat> - status of the message.

<alpha> - string type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.

<length> - length of the PDU in bytes.

<pdu> - message in PDU format according to GSM 3.40.

Parameters and Values Text Mode

Text mode is used when the device is set to text mode by command AT+CMGF=1.

<stat>

- "REC UNREAD"** New message.
- "REC READ"** Read message.
- "STO UNSENT"** Stored message not yet sent.
- "STO SENT"** Stored message already sent.
- "ALL"** All messages.

The representation format for stored messages (either sent or unsent) or received messages (either read or unread, not message delivery confirm) is (information *italics* depends on +CSDH last setting):

```
+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>[,<tooa/toda>,<length>]<CR><LF>
<data>[<CR><LF>
+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>[,<tooa/toda>,<length>]<CR><LF><data>[...]]
```

where:

<index> - message position in the storage

<stat> - message status

<oa/da> - originator/destination address, string type , represented in the currently selected character set (see +CSCS)

<alpha> - string type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.

<scts> - TP-Service Centre Time Stamp in Time String Format

<tooa/toda> - type of number <oa/da>

129 - number in national format

145 - number in international format (contains the "+")

<length> - text length

<data> - TP-User-Data

- If <dc> indicates that GSM03.38 default alphabet is used , each character of GSM alphabet will be converted into current TE character set (see +CSCS)
- If <dc> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
- For #SMSMODE=1 only, if <fo> indicates that a UDH is present each 8-bit octet will be converted into two IRA character long hexadecimal number. The <length> indicates text length in characters without UDH length

If there is at least one message delivery confirm to be listed the representation format is:

(Before using +CMGL, define the validity period and delivery reports with AT+CSMP=49,255,0,0. Then, use AT+CNMI=2,1,0,2,0, where the fourth value to store the delivery confirmation to index. See Example for details.)

When #SMSMODE=0:

```
+CMGL:
<index>,<stat>,<fo>,<mr>,,,<scts>,<dt>,<st>[
<CR><LF>
+CMGL:
<index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>
,<dt>,<st>
[...]]
```

where

<index> - message position in storage

<stat> - message status

<fo> - first octet of the message PDU

When #SMSMODE=1:

```
+CMGL:
<index>,<stat>,<oa/da>,<alpha>,<scts>[,<to
oa/toda>,<length>]<CR><LF><data>[<CR>
<LF>
+CMGL:
<index>,<stat>,<oa/da>,<alpha>,<scts>[,<to
oa/toda>,<length>]<CR><LF><data>[...]]
```

where

<index> - message position in the storage

<stat> - message status

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<scts> - arrival time of the message to the SC
<dt> - sending time of the message
<st> - message status as coded in the PDU

Note: +CMGL reports messages in the same order in which they have been processed by the module.

<fo> - first octet of the message PDU
<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<ra> - recipient address, string type , represented in the currently selected character set (see +CSCS)
<tor> - type of number <ra>
<scts> - arrival time of the message to the SC
<dt> - sending time of the message
<st> - message status as coded in the PDU

Note: The order in which +CMGL reports messages corresponds to their position in the memory storage.

Note: If parameter is omitted the command returns the list of SMS with "REC UNREAD" status.

Notes

- Reference GSM 27.005, 3GPP TS 23.040.

Examples

(Configuration for example)

```
AT+CSMP=49,255,0,0
OK
AT+CNMI=2,1,0,2,0
OK
```

(Below proves no messages are stored)

```
AT+CMGL="ALL"
OK
```

(Sending outbound message)

```
AT+CMGS="2164241372"
> What is happening?
+CMGS: 13
OK
```

(Indication of delivery confirmation stored)

```
+CDSI: "SM",1
```

(Show message listing in different mode)

```
AT#SMSMODE=0
```

```
OK
```

```
AT+CMGL="ALL"
```

```
+CMGL: 1,"REC UNREAD",6,13,,,"13/03/21,13:24:48-24","13/03/21,13:24:48-24",0
```

```
OK
```

```
AT#SMSMODE=1
```

```
OK
```

```
AT+CMGL="ALL"
```

```
+CMGL: 1,"REC READ",6,13,"2164241372",129,"13/03/21,13:24:48-24","13/03/21,13:24:48-24",0
```

```
OK
```

Read Message +CMGR

+CMGR parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Execute command reports the message with location value <index> from <memr> message storage (<memr> is the message storage for read and delete SMs as last settings of command +CPMS).

Test command returns the OK result code.

Syntax

Command	Command type
AT+CMGR=<index>	Execute
AT+CMGR=?	Test

Parameters and Values

<index>	Message index. The output depends on the last settings of command +CMGF (message format to be used).
----------------------	---

PDU Mode

If there is a message in the specific <index>, the output displays in following format:

```
+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>
```

where:

<stat>	Status of the message.
0	New message.
1	Read message.
2	Stored message not yet sent.
3	Stored message already sent.
<alpha>	String type alphanumeric representation of <da> or <oa>. Corresponds to an entry found in the phonebook. Used character set is the one selected with +CSCS.

<length>	Length of the PDU in bytes.
<pdu>	Message in PDU format according to GSM 3.40.

Text Mode

If there is a received message in location index, the output format is (information in *italics* depends on the +CDSH settings):

+CMGR: <stat>,<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data>

If there is a Sent or Unsent message in location <index>:

+CMGR: <stat>,<da>,<alpha>[,<toda>,<fo>,<pid>,<dcsc>,<vp>,<sca>,<tosca>,<length>]<CR><LF><data>

If there is a Message Delivery Confirm in location <index> the output format is:

(Before using +CMGL, define the validity period and delivery reports with AT+CSMP=49,255,0,0. Then, use AT+CNMI=2,1,0,2,0, where the fourth value to store the delivery confirmation to index. See Example for details.)

For #SMSMODE=0:

+CMGR: <stat>,<fo>,<mr>,,,<scts>,<dt>,<st>

For #SMSMODE=1:

+CMGR: <stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>

where:

<stat>	Status of the message.	
"REC UNREAD"	New received message unread	
"REC READ"	Received message read.	
"STO UNSENT"	Message stored not yet sent.	
"STO SENT"	Message stored already sent.	
<fo>	First octet of the message PDU.	
<mr>	Message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.	
<scts>	Arrival time of the message to the SC.	
<dt>	Message sending time.	
<st>	Message status as coded in the PDU.	
<pid>	Protocol Identifier.	
<dcsc>	Data Coding Scheme	
<vp>	Validity period.	
	For #SMSMODE=0, only the integer format is supported.	For #SMSMODE=1, format depends on SMS-SUBMIT <fo> setting (see +CSMP):
		a. <i>Not Present</i> if <fo> tells that the Validity Period Format is <i>Not Present</i> .
		b. <i>Integer type</i> if <fo> tells that the Validity Period Format is <i>Relative</i> .
		c. <i>Quoted time-string type</i> if <fo> tells that the Validity Period Format is <i>Absolute</i> .
		d. <i>Quoted hexadecimal representation of 7 octets</i> if <fo> tells that the Validity Period Format is <i>Enhanced</i> .

<oa>	Originator address, string type represented in the currently selected character set (see +CSCS).
<da>	Destination address, string type represented in the currently selected character set (see +CSCS).
<alpha>	String type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
<sca>	Service Center number.
<tooa>, <toda>, <tosca>	Type of number <oa>,<da>,<sca>.
129	Number in national format.
145	number in international format (contains the "+").
<length>	Text length.
<data>	TP-User_data. <ul style="list-style-type: none"> ■ If <dc> indicates that GSM03.38 default alphabet is used , each character of GSM alphabet will be converted into current TE character set (see +CSCS). ■ If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x4).

Notes: In both cases, if message status is 'received unread', status in the storage changes to 'received read'.

For #SMSMODE=0 only, an error result code is sent on empty record <index>.

Notes

- Reference GSM 27.005.

Examples

(Configuration for example)

```
AT+CSMP=49,255,0,0
```

```
OK
```

```
AT+CNMI=2,1,0,2,0
```

```
OK
```

(Below proves no messages are stored)

```
AT+CMGL="ALL"
```

```
OK
```

(Sending outbound message)

```
AT+CMGS="2164241372"
```

```
> What is happening?
```

```
+CMGS: 13
```

```
OK
```

(Indication of delivery confirmation stored)

```
+CDSI: "SM",1
```

(Show reading of message in different mode)

```
AT#SMSMODE=0
```

```
OK
```

```
AT+CMGR=1
```

```
+CMGR: "REC READ",6,13,,,"13/03/21,13:24:48-24","13/03/21,13:24:48-24",0
```

```
OK
```

```
AT#SMSMODE=1
```

```
OK
```

```
AT+CMGR=1
```

```
+CMGR: "REC READ",6,13,"6124241372",129,"13/03/21,13:24:48-24",  
"13/03/21,13:24:48-24",0
```

```
OK
```

Message Sending and Writing

Send Message +CMGS

+CMGS parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Execute command sends a message to the network.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CMGS=<length>	Execute PDU mode
AT+CMGS=<da>[,<tda>]	Execute Text mode
AT+CMGS=?	Test

Parameters and Values PDU Mode

<length>	Length of the PDU to be sent in bytes, excluding the SMSC address octets.
7-164	After command line is terminated with <CR>, the device responds sending a four character sequence prompt: <CR><LF><greater_than><space> (IRA 13, 10, 62, 32) and waits for the specified number of bytes.

Notes PDU Mode

- The DCD signal shall be in ON state while PDU is given state.
- Echoing given characters back from the TA is controlled by echo command E.
- The PDU is hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line.
- When the SMSC address length octet (given in the PDU) equals zero, the SMSC address set with command +CSCA is used; in this case, the SMSC Type-of-Address octet shall not be present in the PDU.
- To send the message issue Ctrl-Z char (0x1A hex).
- To exit without sending the message issue ESC char (0x1B hex).
- If message is successfully sent to the network, then the result is sent in the format:
+CMGS: <mr>

where:

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.
- If message sending fails for some reason, an error code is reported.
- During command execution, which may take several seconds, ensure that no other SIM interacting commands are issued.

Parameters and Values Text Mode

<da>	Destination address, string type represented in the currently selected character set. See +CSCS. ASCII characters in the set 0-9.
<tda>	Maximum length varies is 20. Destination address type.
129	Number in national format.
145	Number in international format. Contains the "+". After command line is terminated with <CR>, the device responds sending a four character sequence prompt: <CR><LF><greater_than><space> (IRA 13, 10, 62, 32) After this prompt text can be entered; the entered text should be formatted as follows: <ul style="list-style-type: none"> ■ If current <dcs> (see +CSMP) indicates that GSM03.38 default alphabet is used and current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to

GSM 27.005, Annex A. Backspace can be used to delete last character and carriage returns can be used.

For #SMSMODE=1 only, after every <CR> entered by the user, the sequence <CR><LF><greater_than><space> is sent to the TE.

- If current <dc> (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet. For example, . the asterisk will be entered as 2A (IRA50 and IRA65 and this will be converted to an octet with integer value 0x2A.

Notes Text Mode

- The DCD signal shall be in ON state while text is entered. The echo command E controls the echoing of entered characters back from the TA.
- Echoing given characters back from the TA is controlled by echo command E.
- To send the message issue Ctrl-Z char (0x1A hex).
- To exit without sending the message issue ESC char (0x1B hex).
- If message is successfully sent to the network, the result is sent in the format:

+CMGS: <mr>

where <mr> - Message reference number.

- If message sending fails for some reason, an error code is reported.
- During command execution, which may take several seconds, ensure that no other SIM interacting commands are issued.
- It is possible to send a concatenation of at most 10 SMs the maximum number of chars depends on <dc>:

If #SMSMODE=0

1530 chars if 3GPP TS 23.038 default alphabet is used;
1340 chars if 8-bit is used;
670 chars if UCS2 is used.

If #SMSMODE=1

1520 chars if 3GPP TS 23.038 default alphabet is used;
1330 chars if 8-bit is used;
660 chars if UCS2 is used.

Notes

- To avoid malfunctions, wait for the +CMGS: <mr> or +CMS ERROR: <err> response before issuing further commands.
- Reference GSM 27.005.

Write Message to Memory +CMGW

+CMGW parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Execute command writes in the <memw> memory storage a new message.

Test command returns the OK result code.

Syntax

Command	Command type
(PDU Mode) AT+CMGW=<length>[,<stat>]	Execute PDU mode
(Text Mode) AT+CMGW[=<da>[,<toda>[,<stat>]]]	Execute Text mode
AT+CMGW=?	Test

Parameters and Values PDU Mode

<length>	Length in bytes of the PDU to be written.
7-164	
<stat>	Message status.
0	New message. For #SMSMODE=1 only, received unread message; default for DELIVER messages (3GPP TS 23.040 SMS-DELIVER messages).
1	Read message.
2	Stored message not yet sent. Default: 2. For #SMSMODE=1 only, default for SUBMIT messages (3GPP TS 23.040 SMS-SUBMIT messages).
3	Stored message already sent.

Notes PDU Mode

- The device responds to the command with the prompt '>' and waits for the specified number of bytes.
- To write the message issue Ctrl-Z char (0x1A hex).
- To exit without writing the message issue ESC char (0x1B hex).
- If message is successfully written in memory, the result is sent in the format:
+CMGW: <index>

where:

<index> - message location index in the memory <memw>.
- If message storing fails for some reason, an error code is reported.
- During command execution, which may take several seconds, ensure that no other SIM interacting commands are issued.
- For #SMSMODE=1 only, not only SUBMIT messages can be stored in SIM as per #SMSMODE=0, but also DELIVER and STATUS REPORT messages (3GPP TS 23.040 SMS-STATUS-REPORT messages). SUBMIT messages can only be stored with status 2 or 3; DELIVER and STATUS REPORT messages can only be stored with status 0 or 1.

Example PDU Mode

$$AT+CMGF=0$$

OK

$$AT + CMGW = 35$$
 \succ

07801091346554F307801096224658F1100200001662

[illegible]

Parameters and Values Text Mode

<da>	Destination address, string type represented in the currently selected character set. See +CSCS. ASCII characters in the set 0-9.
<toda>	Maximum length is 20 characters.
<type>	Type of destination address.
129	Number in national format.
145	Number in international format. Contains the "+".
<stat>	Message status.
"REC UNREAD"	New received message unread.
	If #SMSMODE=1, default for DELIVER messages.
"REC READ"	Received message read
"STO UNSENT"	Message stored not yet sent. Default: "STO UNSENT" .
	If #SMSMODE=1, default for SUBMIT messages.
"STO SENT"	Message stored already sent.

After command line is terminated with <CR>, the device responds sending a four character sequence prompt:

```
<CR><LF><greater than><space> (IRA 13, 10, 62, 32)
```

After this prompt text can be entered; the entered text should be formatted as follows:

- If current <dc> (see +CSMP) indicates that GSM03.38 default alphabet is used and current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. Backspace can be used to delete last character and carriage returns can be used.
- If #SMSMODE=1, For #SMSMODE=1 only, after every <CR> entered by the user, the sequence <CR><LF><greater than><space> is sent to the TE.

- If current <dc> (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet. For example, the asterisk will be entered as 2A (IRA50 and IRA65) and this will be converted to an octet with integer value 0x2A.

Notes Text Mode

- The DCD signal is in ON state while text is entered.
- Echoing entered characters back from the TA is controlled by echo command E.
- To write the message issue Ctrl-Z char (0x1A hex).
- To exit without writing the message issue ESC char (0x1B hex).
- If message is successfully written in the memory, then the result is sent in the format:

+CMGW: <index>

where:

<index> - message location index in the memory <memw>.

- If message storing fails for some reason, an error code is reported.
- During command execution, which may take several seconds, ensure that no other SIM interacting commands are issued.
- It is possible to send a concatenation of at most 10 SMs the maximum number of chars depends on <dc>:
 - 1530 chars if 3GPP TS 23.038 default alphabet is used;
 - 1340 chars if 8-bit is used;
 - 670 chars if UCS2 is used.
 For #SMSMODE=1 only, if entered text is longer than this maximum value, an error is raised.
- For #SMSMODE=1 only, in text mode, not only SUBMIT messages can be stored in SIM as per #SMSMODE=0, but also DELIVER messages. The type of saved message depends upon the current <fo> parameter (see +CSMP). For a DELIVER message, current <vp> parameter (see +CSMP) is used to set the message Service Centre Time Stamp <scts>, so it has to be an absolute time string, for example, "09/01/12,11:15:00+04". SUBMIT messages can only be stored with status "STO UNSENT" or "STO SENT"; DELIVER messages can only be stored with status "REC UNREAD" or "REC READ".

Example Text Mode

AT+CMGW=?

OK

AT+CMGF=1

OK

AT+CMGW

> Test message

> Ctrl+Z must be used to write message

+CMGW: 1

OK

```
AT+CMGW="9194397977"  
  
> Test SMS  
  
+CMGW: 2  
  
OK  
  
AT+CMGW="9194397977",129  
  
> Test SMS  
  
+CMGW: 3  
  
OK
```

Notes

- Reference GSM 27.005
- To avoid malfunctions, wait for the +CMGW: <index> or +CMS ERROR: <err> response before issuing further commands.

Send Message from Storage +CMSS

Execute command sends to the network a message that is already stored in the <memw> storage (see +CPMS) at the location <index>.

Test command returns the OK result code.

Syntax

Command	Command type
AT+CMSS=<index>[,<da>[,<toda>]]	Execute
AT+CMSS=?	Test

Parameters and Values

- <index>

<da>

<toda>

129

145
- In the message storage <memw>, the location value of the message to send.

Destination address, string type represented in the currently selected character set (see +CSCS); if given it is used instead of the one stored with the message.

Type of destination address.

Number in national format.

Number in international format (contains the "+").

If message is successfully sent to the network then the result is sent in the format:
+CMSS: <mr>

where:
<mr> - message reference number.

If message sending fails for some reason, an error code is reported:

+CMS ERROR:<err>

Notes

- To store a message in the <memw> storage see command +CMGW.
- During command execution, which may take several seconds, ensure that no other SIM interacting commands are issued.
- To avoid malfunctions is suggested to wait for the +CMSS: <mr> or +CMS ERROR: <err> response before issuing further commands.
- Reference: GSM 27.005.

Example Text Mode

```
AT+CMGF=1
OK
AT+CMGW="0165872928"
> test message...
+CMGW: 5
OK
AT+CMSS=5
+CMSS: 136
OK
```

Delete Message +CMGD

+CMGD parameters and behavior depend on whether or not you have enabled improved SMS commands with #SMSMODE.

Execute command deletes messages from memory <memr>.

Test command shows the valid memory locations and optionally, <delflag> supported values.

+CMGD: (supported <index>s list)[,(supported <delflag>s list)]

Syntax

Command	Command type
AT+CMGD=<index>[,<delflag>]	Execute
AT+CMGD=?	Test

Parameters and Values

<index>	Message index in the selected storage <memr> that can have values form 1 to N, where N depends on the available space (see +CPMS).
<delflag>	Integer indicating multiple message deletion request.
0	If 0 or value omitted, delete message specified in <index>.
1	Delete all read messages from <memr> storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched
2	Delete all read messages from <memr> storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched.

- | | |
|---|---|
| 3 | Delete all read messages from <memr> storage, sent, and unsent mobile originated messages, leaving unread messages untouched. |
| 4 | Delete all messages from <memr> storage. |

Notes

- If <delflag> is present and not set to 0 then, if <index> is greater than 0, <index> is ignored and ME follows the rules for <delflag> shown above.
- If #SMSMODE=0 only and if the location to be deleted is empty, an error message is reported.
- Reference: GSM 27.005.

Example

AT+CMGD=?

+CMGD: (1, 2, 3, 6, 7, 17, 18, 19, 20, 37, 38, 39, 47), (0-4)

OK

Select Service for MO SMS Messages +CGSMS

Set command specifies the service or service preference that the MT uses to send MO SMS messages.

Read command returns the currently selected service or service preference in the form:

+CGSMS: <service>

Test command reports the supported list of currently available services <service>.

Syntax

Command	Command type
AT+CGSMS=<service>	Set
AT+CGSMS?	Read
AT+CGSMS=?	Test

Parameters and Values

- | | |
|------------------------|--|
| <service> | Numeric parameter indicating the service or service preference used. |
| 0 | GPRS. |
| 1 | Circuit switched. Default: 1. |
| 2 | GPRS preferred. Use circuit switched if SMS through GPRS service not available or GPRS not registered. |
| 3 | Circuit switched preferred. Use GPRS if SMS through GSM service not available or GSM not registered. |

Notes

- The <service> value is saved on non-volatile memory as global parameter.

Custom AT Commands

General Configuration AT Commands

Network Selection Menu Availability **+PACSP**

Read command returns the current value of the <mode> parameter in the format:

+PACSP<mode>

where:

<mode>	PLMN mode bit (in CSP file on the SIM).
0	Restriction of menu option for manual PLMN selection.
1	No restriction of menu option for Manual PLMN selection.

Test command returns the OK result code.

Syntax

Command	Command type
AT+PACSP?	Read
AT+PACSP=?	Test

Notes

- The command is available only if the ENS functionality has been previously enabled (see #ENS)

Manufacturer Identification **#CGMI**

Execute command returns the device manufacturer's identification code with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGMI	Execute
AT#CGMI=?	Test

Example

```
AT#CGMI
#CGMI: Telit
OK
```

Model Identification #CGMM

Execute command returns the device manufacturer's model identification code with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGMM	Execute
AT#CGMM=?	Test

Example

```
AT#CGMM
```

```
#CGMM: GE910-QUAD
```

```
OK
```

Revision Identification #CGMR

Execute command returns the manufacturer's software revision number with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGMR	Execute
AT#CGMR=?	Test

Example

```
AT#CGMR
```

```
#CGMR: 13.00.003
```

```
OK
```

Product Serial Number Identification #CGSN

Execute command returns the mobile equipment identifier (IMEI) in decimal with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CGSN	Execute
AT#CGSN=?	Test

International Mobile Subscriber Identity (IMSI) #CIMI

Execute command returns the international mobile subscriber identity, identified as the IMSI number, with command echo.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CIMI	Execute
AT#CIMI=?	Test

Example

AT#CIMI

#CIMI: 310001114445555

OK

Read ICCID (Integrated Circuit Card Identification) #CCID

Execute command reads the ICCID—card identification number that provides a unique identification number for the SIM—on SIM.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CCID	Execute
AT#CCID=?	Test

Service Provider Name #SPN

Execute command returns the service provider string contained in the SIM field SPN, in the format:

#SPN:<spn>

where:

<spn> Service provider string contained in the SIM field SPN, represented in the currently selected character set (see +CSCS).

Test command returns the OK result code.

Syntax

Command	Command type
AT#SPN	Execute
AT#SPN=?	Test

Notes

- If supported by SIM. If not support by SIM, may return ERROR.
- If the SIM field SPN is empty, the command returns just the OK result code.

Extended Numeric Error Report #CEER

Execute command causes the TA to return a numeric code in the format:

#CEER: <code>

This tells you the reason for:

- The failure in the last unsuccessful call setup (originating or answering).
- The last call release.
- The last unsuccessful GPRS attach or unsuccessful PDP context activation.
- The last GPRS detach or PDP context deactivation.

Note: If none of the previous conditions has occurred since power up, 0 “No error” is reported.

Test command returns OK result code.

Syntax

Command	Command type
AT#CEER	Execute
AT#CEER=?	Test

<code> values as follows:

Value	Diagnostic
0	No error.
1	Unassigned (unallocated) number.
3	No route to destination.
6	Channel unacceptable.
8	Operator determined barring.
16	Normal call clearing.
17	User busy.
18	No user responding.
19	User alerting, no answer.
21	Call rejected.
22	Number changed.
26	Non selected user clearing.
27	Destination out of order.
28	Invalid number format (incomplete number).
29	Facility rejected.
30	Response to STATUS ENQUIRY.
31	Normal, unspecified.
34	No circuit/channel available.
38	Network out of order.
41	Temporary failure.
42	Switching equipment congestion.
43	Access information discarded.
44	Requested circuit/channel not available.

47	Resources unavailable, unspecified.
49	Quality of service unavailable.
50	Requested facility not subscribed.
55	Incoming calls barred within the CUG.
57	Bearer capability not authorized.
58	Bearer capability not presently available.
63	Service or option not available, unspecified.
65	Bearer service not implemented.
68	ACM equal to or greater than ACMmax.
69	Requested facility not implemented.
70	Only restricted digital information bearer capability is available.
79	Service or option not implemented, unspecified.
81	Invalid transaction identifier value.
87	User not member of CUG.
88	Incompatible destination.
91	Invalid transit network selection.
95	Semantically incorrect message.
96	Invalid mandatory information.
97	Message type non-existent or not implemented.
98	Message type not compatible with protocol state.
99	Information element non-existent or not implemented.
100	Conditional IE error.
101	Message not compatible with protocol state.
102	Recovery on timer expiry.
111	Protocol error, unspecified.
127	Interworking, unspecified.

GPRS related errors

224	MS requested detach.
225	NWK requested detach.
226	Unsuccessful attach cause NO SERVICE.
227	Unsuccessful attach cause NO ACCESS.
228	Unsuccessful attach cause GPRS SERVICE REFUSED.
229	PDP deactivation requested by NWK.
230	PDP deactivation cause LLC link activation failed.
231	PDP deactivation cause NWK reactivation with same TI.
232	PDP deactivation cause GMM abort.
233	PDP deactivation cause LLC or SNDSCP failure.
234	PDP unsuccessful activation cause GMM error.
235	PDP unsuccessful activation cause NWK reject.
236	PDP unsuccessful activation cause NO NSAPI available .
237	PDP unsuccessful activation cause SM refuse .
238	PDP unsuccessful activation cause MMI ignore.

239	PDP unsuccessful activation cause Nb Max Session Reach.
256	PDP unsuccessful activation cause wrong APN.
257	PDP unsuccessful activation cause unknown PDP address or type.
258	PDP unsuccessful activation cause service not supported.
259	PDP unsuccessful activation cause QOS not accepted.
260	PDP unsuccessful activation cause socket error.

Other custom values

240	FDN is active and number is not in FDN
241	Call operation not allowed
252	Call barring on outgoing calls
253	Call barring on incoming calls
254	Call impossible
255	Lower layer failure

Notes

- Reference: GSM 04.08.

Extended Error Report for Network Reject Cause #CEERNET

Execute command causes the TA to return a numeric code in the format

#CEERNET: <code>

This offers the user of the TA a report for the last mobility management (MM) or session management (SM) procedure not accepted by the network and a report of detach or deactivation causes from network.

<code> values as follows:

Value	Diagnostic
2	IMSI UNKNOWN IN HLR
3	ILLEGAL MS
4	IMSI UNKNOWN IN VISITOR LR
5	IMEI NOT ACCEPTED
6	ILLEGAL ME
7	GPRS NOT ALLOWED
8	OPERATOR DETERMINED BARRING(SM cause failure)/GPRS AND NON GPRS NOT ALLOWED(GMM cause failure)
9	MS IDENTITY CANNOT BE DERIVED BY NETWORK
10	IMPLICITLY DETACHED
11	PLMN NOT ALLOWED
12	LA NOT ALLOWED
13	ROAMING NOT ALLOWED
14	GPRS NOT ALLOWED IN THIS PLMN
15	NO SUITABLE CELLS IN LA
16	MSC TEMP NOT REACHABLE

Value	Diagnostic
17	NETWORK FAILURE
22	CONGESTION
25	LLC OR SMDCP FAILURE
26	INSUFFICIENT RESOURCES
27	MISSING OR UNKNOWN APN
28	UNKNOWN PDP ADDRESS OR PDP TYPE
29	USER AUTHENTICATION FAILED
30	ACTIVATION REJECTED BY GGSN
31	ACTIVATION REJECTED UNSPECIFIED
32	SERVICE OPTION NOT SUPPORTED
33	REQ. SERVICE OPTION NOT SUBSCRIBED
34	SERV.OPTION TEMPORARILY OUT OF ORDER
35	NSAPI ALREADY USED
36	REGULAR DEACTIVATION
37	QOS NOT ACCEPTED
38	CALL CANNOT BE IDENTIFIED(MM cause failure) /SMN NETWORK FAILURE(SM cause failure)
39	REACTIVATION REQUIRED
40	NO PDP CTXT ACTIVATED(GMM cause failure)/FEATURE NOT SUPPORTED(SM cause failure)
41	SEMANTIC ERROR IN TFT OPERATION
42	SYNTACTICAL ERROR IN TFT OPERATION
43	UNKNOWN PDP CNTXT
44	SEM ERR IN PKT FILTER
45	SYNT ERR IN PKT FILTER
46	PDP CNTXT WITHOUT TFT ACTIVATED
48	RETRY ON NEW CELL BEGIN(if MM cause failure) /ACTIVATION REJECTED BCM VIOLATION(if SM cause failure)
81	INVALID TRANSACTION IDENTIFIER
95	SEMANTICALLY INCORRECT MESSAGE
96	INVALID MANDATORY INFORMATION
97	MSG TYPE NON EXISTENT OR NOT IMPLEMENTED
98	MSG TYPE NOT COMPATIBLE WITH PROTOCOL STATE
99	IE NON_EXISTENT OR NOT IMPLEMENTED
100	CONDITIONAL IE ERROR
101	MSG NOT COMPATIBLE WITH PROTOCOL STATE
111	PROTOCOL ERROR UNSPECIFIED

Test command returns OK result code.

Syntax

Command	Command type
AT#CEERNET	Execute
AT#CEERNET=?	Test

Notes

- Reference: 3GPP 24.008.

Select Registration Operation Mode #REGMODE

In some cases, unsolicited response codes controlled by either +CREG or +CGREG differ slightly from ETSI specifications. This is basic operation mode. Enhanced operation mode uses the ETSI specifications.

Set command sets the registration status command operation mode.

Read command returns the current registration operation mode.

Test command reports the available value range for <mode>.

Syntax

Command	Command type
AT#REGMODE=<mode>	Set
AT#REGMODE?	Read
AT#REGMODE=?	Test

Parameters and Values

<mode>	Registration status commands operation mode.
0	Basic operation mode
1	Enhanced operation mode. Default: 1.

Note

- Affects +CREG and +CGREG.

SMS Commands Operation Mode #SMSMODE

Set command enables or disables the improved SMS commands operation mode.

Read command reports whether the improved SMS commands operation mode is enabled or not, in the format:

#SMSMODE: <mode>

Test command reports the available value range for <mode>.

Syntax

Command	Command type
AT#SMSMODE=<mode>	Set
AT#SMSMODE?	Read
AT#SMSMODE=?	Test

Parameters and Values

<mode>	SMS command operation mode.
0	Disables improved SMS commands operation mode. Default: 0.
1	Enables improved SMS commands operation mode.
2	When FDN is enabled, checks for SMS service center address in the FDN phonebook. If address is not present, SMS cannot be sent.

Note

- Affects +CPMS, +CNMI, +CMGS, +CMGW, +CMGL, +CMGR, +CMGD, +CSMP.

PLMN List Selection #PLMNMODE

Set command selects the list of PLMN names to be used currently.

Read command reports whether the currently used list of PLMN names is fixed or not, in the format:

#PLMNMODE: <plmnlist>

Test command returns the supported value range for <plmnlist>.

Syntax

Command	Command type
AT#PLMNMODE=<plmnlist>	Set
AT#PLMNMODE?	Read
AT#PLMNMODE=?	Test

Parameters and Values

<plmnlist>	PLMN name list.
0	PLMN names list, used in commands like +COPS or #MONI, is fixed and depends upon currently selected interface
1	PLMN names list is not fixed and can be updated in newer software versions. Default: 1.

Note

- <plmnlist> is saved in the non-volatile memory.

Display PIN Counter #PCT

Execute command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, depending on +CPIN requested password in the format:

#PCT: <n>

where:

<n>	Remaining attempts.
0	SIM is blocked.
1-3	If the device is waiting, SIM PIN or SIM PIN2 is given.
1-10	If device is waiting, SIM PUK or SIM PUK2 is given.

Test command returns the OK result code.

Syntax

Command	Command type
AT#PCT	Execute
AT#PCT=?	Test

Software Shut Down #SHDN

Execute command causes device to detach from the network and shut down. Before definitive shut down an OK, response is returned.

Test command returns the OK result code.

Syntax

Command	Command type
AT#SHDN	Execute
AT#SHDN=?	Test

Notes

- After this execute command is issued, previous activity is terminated. The device does not respond to any further command.
- To turn device on again, toggle the hardware pin ON/OFF must be tied low.
- The maximum time to shutdown the device, completely is 25 seconds.

Extended Reset #Z

Set command loads both base section and extended section of the specified user profile stored with AT&W and selected with AT&P.

Test command tests for command existence.

Syntax

Command	Command type
AT#Z=<profile>	Set
AT#Z=?	Test

Parameters and Values

<profile>

- | | |
|----------|-----------------|
| 0 | User profile 0. |
| 1 | User profile 1. |

Periodic Reset #ENHRST

Set command enables or disables the unit reset after <delay> minutes.

Read command reports the current parameter settings for # ENHRST command in the format:

ENHRST: < mod >[,<delay>,<remainTime>]

where:

<remainTime> - time remaining before next reset

Test command reports supported range of values for <mod> and <delay>.

Syntax

Command	Command type
AT#ENHRST=<mod>[,<delay>]	Set
AT#ENHRST?	Read
AT#ENHRST=?	Test

Parameters and Values

<mod>

- 0** Disables the unit reset. **Default: 0.**
- 1** Enables the unit reset one time.
- 2** Enables the periodic unit reset.

<delay>

Time interval after which the unit reboots. Numeric value in minutes.

Notes

- Settings are saved automatically in non-volatile memory only if old or new mod is 2. Any change from 0 to 1 or from 1 to 0 is not stored in non-volatile memory.
- The particular case AT#ENHRST=1,0 causes the module to immediately reboot. So if AT#ENHRST=1,0 follows an AT command that stores some parameters in non-volatile memory, it is recommended to insert a delay of at least 5 seconds before to issuing AT#ENHRST=1,0. Doing so permits the storing of parameters in non-volatile memory to finish.

Examples

Module reboots after 60 minutes

```
AT#ENHRST=1,60
```

Module reboots now

```
AT#ENHRST=1,0
```

Module reboots after 60 minutes and indefinitely after every following power on

```
AT#ENHRST=2,60
```

Wake from Alarm Mode #WAKE

Execute command stops any present alarm activity. If the module is in alarm mode, it exits the alarm mode and enters the normal operating mode.

Read command returns the operating status of the device in the format:

```
#WAKE: <status>
```

where:

<status>

- 0** Normal operating mode.
- 1** Alarm mode or normal operating mode with some alarm activity.

Test command returns OK result code.

Syntax

Command	Command type
AT#WAKE=[<opmode>]	Execute
AT#WAKE?	Read
AT#WAKE=?	Test

Parameters and Values

<opmode>	Operating mode.
0	Normal operating mode. The module exits the alarm mode, enters the normal operating mode. Alarm activity—for example alarm tone playing—is stopped and an OK result code is returned.

Notes

- The alarm mode is indicated by status ON of hardware pin CTS and by status ON of pin DSR. The power saving status is indicated by a CTS - OFF and DSR - OFF status. The normal operating status is indicated by DSR - ON.
- During the alarm mode, the device will not scan the network or register to any network. Therefore, the device cannot dial or receive any call or SM. The only commands that can be issued to the module in this state are #WAKE and #SHDN. No other command should be issued during this state.
- If the #WAKE=0 command is issued after an alarm has been set with +CALA, but before the alarm expires, it will answer OK but have no effect.

Query Temperature Overflow #QTEMP

Read command queries the device internal temperature sensor for over temperature and reports in the format:

#QTEMP: <temp>

where:

<temp>	The over temperature indicator.
0	The device temperature is in the working range.
1	The device temperature is out of the working range.

Test command reports supported value range for parameter <mode>.

Syntax

Command	Command type
AT#QTEMP?	Read
AT#QTEMP=?	Test

Notes

- Do not operate the device outside of its working temperature range; otherwise, the device may not function properly. Consult your model's documentation for the temperature range for your device.

Temperature Monitor #TEMPMON

Set command sets the behavior of module internal temperature monitor.

Read command reports the current setting for #TEMPMON in the format:

#TEMPMON: <urcmode>,<action>[,<hyst_time>[,<GPIO>]]

Test command reports supported value range for parameter <mod>, <urdmode>, <action>, <hyst_time>, and <GPIO>.

Note: GPIO is not currently supported.

Syntax

Command	Command type
AT#TEMPMON=<mod>[,<urcmode>[,<action>[,<hyst_time>[,<GPIO>]]]]	Set
AT#TEMPMON?	Read
AT#TEMPMON=?	Test

Parameters and Values

<mod>

- 0** Sets the command parameters.
- 1** Triggers measurement of the module internal temperature and reports the result in the format:
#TEMPMEAS: <level>,<value>

where:

<level> - Threshold level.

-2 - Extreme temperature lower bound, -30°C.

-1 - Operating temperature lower bound, -10°C.

0 - Normal temperature

1 - Operating temperature upper bound, +55°C.

2 - Extreme temperature upper bound, +80°C.

Notes:

Threshold levels are for the radio only.

Threshold temperatures are $\pm 2^{\circ}\text{C}$.

Refer to your User Guide or Developer Guide for operating temperature ranges for your device.

<value>

Actual temperature in Celsius degrees

The following parameters have meaning of <mod>=0.

<urcmode>

URC presentation mode.

- 0** Disables temperature monitor URC presentation.
- 1** Enables temperature monitor URC presentation, when the module internal temperature reaches either operating or extreme temperatures.

For extreme levels, the URC and action be applied as:
Hysteresis time, URC message, 5 sec delay, action.

The unsolicited message is in the format:
#TEMPMEAS: <level>,<value>

Where <level> and <value> are as before.

<action>

Sum of integers, each representing the action to be done when the module internal temperature reaches either operating or extreme levels (default is 1). If <action> is not zero, it is mandatory to set the <hyst_time> parameter too.

0

No action.

1

Automatic shutdown when the temperature is beyond the extreme bounds.

2

RF TX circuits automatically disabled (using +CFUN=2) when operating temperature bounds are reached. When the temperature is back to normal, the module is brought back to the previous state, before RF TX disabled.

4

Not supported.

<hyst>

Hysteresis time: all the actions happen only if the extreme or operating bounds are maintained at least for this period. This parameter is required if <action> is not zero.

Note: <action> can assume values from
Time in seconds.

0 - 255

<GPIO>

Not supported.

Notes

- The URC presentation mode <urcmode> is related to the current AT instance only (see +CMUX); last <urcmode> settings are saved for every instance as extended profile parameters, thus it is possible to restore them either if the multiplexer control channel is released and set up, back and forth.
- The last <action> and <hyst_time> are global parameters saved in non-volatile memory.
- The automatic power off is deferred for emergency calls.

SMS Ring Indicator #E2SMSRI

Set command enables or disables the ring indicator (RI) pin response to an incoming SMS message. If enabled, a negative going pulse is generated on receipt of an incoming SMS message. The duration of this pulse is determined by the value of <n>.

Read command reports the duration in ms of the pulse generated on receipt of an incoming SM, in the format:

#E2SMSRI: <n>

Note: Value <n>=0 means that the RI pin response to an incoming SM is disabled.

Test command reports the range of supported values for parameter <n>.

Syntax

Command	Command type
AT#E2SMSRI=[<n>]	Set
AT#E2SMSRI?	Read
AT#E2SMSRI=?	Test

Parameters and Values

<n>	RI enabling
0	Disables RI pin response for incoming SMS messages. Default: 0.
50-1150	Enables RI pin response for incoming SMS messages. The value of <n> is the duration in ms of the pulse generated on receipt of an incoming SM.

Note:

- If +CNMI=3,1 is issued and the module is in a GPRS connection, a 100 ms break signal is sent and a 1 sec. pulse is generated on RI pin, no matter if the RI pin response is either enabled or not.

Example

```
AT#E2SMSRI=?
#E2SMSRI: (0,50-1150))
OK
AT#E2SMSRI?
#E2SMSRI: 0
OK
AT#E2SMSRI=50
OK
AT#E2SMSRI?
#E2SMSRI: 50
OK
```

Read Analog/Digital Converter Input #ADC

Execution command reads pin <adc> voltage, converted by ADC and outputs in the format:

#ADC: <value>

where:

<value> - pin<adc> voltage, expressed in mV

Read command reports the pin's voltage, converted by ADC, in the format:

#ADC: <value>[<CR><LF>#ADC: <value>[...]]

Test command reports the supported values of <adc>, <mode>, and <dir> command parameters.

Syntax

Command	Command type
AT#ADC=[<adc>,<mode>[,dir]]	Execute
AT#ADC?	Read
AT#ADC=?	Test

Parameters and Values

<adc>	Pin index
1	Available.
<mode>	Required action.
2	Query ADV value.
<dir>	Direction. Interpretation not currently implemented.
0	No effect.

Note:

- Command returns the last valid measure.

V24 Output Pins Mode #V24MODE

Set command sets the <port> serial interface functioning <mode>.

Read command returns actual functioning <mode> for all ports in the format:

```
#V24MODE: 0,<mode_port0>,<when0>[<CR><LF>
#V24MODE: 1,<mode_port1>,<when1> [<CR><LF>
```

where:

<mode_port0>	Serial port 0 mode.
<mode_port1>	Serial port 1 mode.
<when0>	Serial port 0 when setting.
<when1>	Serial port 1 when setting.

Test command reports support value range for <port>, <mode>, and <when>.

Syntax

Command	Command type
AT#V24MODE=<port>,<mode>,<when>	Set
AT#V24MODE?	Read
AT#V24MODE=?	Test

Parameters and Values

<port>	Serial port
0	ASC0 (AT command port)
1	ASC1 (trace port)
<mode>	AT commands serial port interface hardware pins mode.
0	TX and RX pins are set in push/pull function during power saving. Default: 0.
1	TX and RX pins are set in open drain function during power saving.
2	Reserved.
<when>	When the command is applied.
0	Always. Default: 0.
1	In power saving only.

Examples

```
AT#V24MODE?
```

```
#V24MODE: 0,0,0
```

```
#V24MODE: 1,0,0
```

V24 Output Pins Configuration #V24CFG

Set command sets the AT commands serial port interface output pins mode.

Read command returns actual mode for all the pins—output or input—in the format:

```
#V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF>
```

```
#V24CFG: <pin2>,<mode2>[...]]
```

where:

<pin*n*> - AT command serial port interface HW pin

<mode*n*> - AT commands serial port interface hardware pin mode

Test command reports supported range of values for <pin> and <mode>.

Syntax

Command	Command type
AT#V24CFG=<pin>,<mode>	Set
AT#V24CFG?	Read
AT#V24CFG=?	Test

Parameters and Values

<pin>	AT commands serial port interface hardware pin.
0	DCD (Data Carrier Detect)
1	CTS (Clear To Send)
2	RI (Ring Indicator)
3	DSR (Data Set Ready). Not supported.
4	DTR (Data Terminal Ready). This is not an output pin. Value is maintained for backward compatibility. Trying to set its state raises the result code "ERROR" Not yet implemented.
5	RTS (Request To Send). This is not an output pin. Trying to set its state raises the result code "ERROR"
<mode>	AT commands serial port interface hardware pins mode:
0	AT commands serial port mode: output pins are controlled by serial port device driver. Default: 0.
1	Not supported.

V24 Output Pins Control #V24

Set command sets the AT commands serial port interface output pins state.

Read command returns actual state for all the pins—output or input—in the format:

```
#V24: <pin1>,<state1>[<CR><LF>
```

```
#V24: <pin2>,<state2>[...]]
```

where

<pin*n*> - AT command serial port interface HW pin

<state*n*> - AT commands serial port interface hardware pin state

Test command reports supported range of values for <pin> and <state>.

Syntax

Command	Command type
AT#V24=<pin>[,<state>]	Set
AT#V24?	Read
AT#V24=?	Test

Parameters and Values

<pin>	AT commands serial port interface hardware pin.
0	DCD (Data Carrier Detect).
1	CTS (Clear To Send).
2	RI (Ring Indicator).
3	DSR (Data Set Ready).
4	DTR (Data Terminal Ready). This is not an output pin: value is maintained only for backward compatibility, but trying to set its state raises the result code "ERROR" Not yet implemented.
5	RTS (Request To Send). This is not an output pin. Trying to set its state raises the result code "ERROR"
<state>	Not supported. Command returns actual state of the pin.

RF Transmission Monitor Mode #TXMONMODE

Set command sets the TXMON pin behavior.

Read command reports the <mode> value, in the format:

```
#TXMONMODE: <mode>
```

Test command reports supported values for <mode>.

Syntax

Command	Command type
AT#TXMONMODE=[<mode>]	Set
AT#TXMONMODE?	Read
AT#TXMONMODE=?	Test

Parameters and Values

<mode>

- 0** TXMON pin goes high when a call starts and drops when the call ends. It also goes high when a location update starts and drops when the location update procedure stops. It goes high during SMS transmitting and receiving.
- 1** TXMON is set in alternate mode and the time unit controls its state. TXMON goes high 200µs before TXEN goes high. Then, power ramps start rising and there is the burst transmission. TXMON drops 47µs after power ramps stop falling down. This behavior repeats for every transmission burst.

Notes

- If <mode> changes from 1 to 0 during a call, TXMON goes down. If it is restored to 1, TXMON behaves as usual, following the bursts.

Battery and Charger Status #CBC

Execute command returns the current battery and charger state in the format:

#CBC: <ChargerState>,<BatteryVoltage>

where:

- <ChargerState>** Battery charger state.
 - 0** Charger not connected.
 - 1** Charger connected and charging.
 - 2** Charger connected and charge completed.
- <BatteryVoltage>** Battery voltage in units of ten millivolts: it is the real battery voltage only if charger is not connected; if the charger is connected, this value depends on the charger voltage.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CBC	Execute
AT#CBC=?	Test

GPRS Auto-Attach Property #AUTOATT

Set command enables or disables the TE GPRS auto-attach property when the module is in GPRS class B. See AT+CGCLASS.

Read command reports whether the auto-attach property is currently enabled or not, in the format:

```
#AUTOATT: <auto>
```

Test command reports available values for parameter <auto>.

Syntax

Command	Command type
AT#AUTOATT=[<auto>]	Set
AT#AUTOATT?	Read
AT#AUTOATT=?	Test

Parameters and Values

<auto>

- 0** Disables GPRS auto-attach property.
- 1** Enables GPRS auto-attach property. **Default: 1.**
After the command #AUTOATT=1 is issued—and at every following startup—the terminal automatically tries to attach to the GPRS service.

Multislot Class Control #MSCLASS

Set command sets the multislot class.

Read command reports the current value of the multislot class in the format:

```
#MSCLASS: <class>
```

Test command reports the range of available values for both parameters <class> and <autoattach>.

Syntax

Command	Command type
AT#MSCLASS=[<class>[,<autoattach>]]	Set
AT#MSCLASS?	Read
AT#MSCLASS=?	Test

Parameters and Values

<class>

- Multislot class. Class 7 is not supported.
- 1-6** GPRS class.
- 8-10** GPRS class.

<autoattach>

- 0** New multislot class is enabled only at the next detach/attach or after a reboot.
- 1** New multislot class is enabled immediately, automatically forcing detach/attach procedure.

Cell Monitor #MONI

#MONI is both a Set and an Execute command.

Set command sets one cell out of seven, in the neighbor list of the serving cell including it, from which GSM-related information is extracted.

Execute command (AT#MONI<CR>) reports GSM-related information for selected cell and dedicated channel (if it exists).

Test command reports the maximum number of cells, in the neighbor list of the serving cell excluding it, from which GSM-related information can be extracted, along with the ordinal number of the current selected cell, in the format:

#MONI: (<MaxCellNo>,<CellSet>)

where:

<MaxCellNo>	Maximum number of cells, in the neighbor list of the serving cell and excluding it, from which GSM-related information can be extracted. This value is always 6.
<CellSet>	Last setting done with command #MONI.

Syntax

Command	Command type
AT#MONI[=<number>]]	
AT#MONI=?	

Parameters and Values

<number>

GSM network

0-6	The ordinal number of the cell, in the neighbor list of the serving cell. Default: 0 , serving cell.
7	Special request to obtain GSM-related information from the whole set of seven cells in the neighbor list of the serving cell.

If the last setting done by #MONI is in the range [0-6], the output format is as follows:

- When extracting data for the serving cell and the network name is known the format is:
#MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA:<timadv>
- When the network name is unknown, the format is:
#MONI: Cc:<cc> Nc:<nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>
- When extracting data for an adjacent cell, the format is:
#MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm> dBm

where:

<netname>	Name of network operator.
<cc>	Country code.
<nc>	Network operator code.
<n>	Progressive number of adjacent cell.
<bsic>	Base station identification code.
<qual>	Quality of reception.
0-7	
<lac>	Localization area code.
<id>	Cell identifier.
<arfcn>	Assigned radio channel
<dBm>	Received signal strength in dBm; for serving cell in UMTS network this is not available during a call, and is displayed as 0.
<timadv>	Timing advance.

Note: TA: <timadv> is reported only for the serving cell.

If the last setting done by #MONI is 7, the Execute command produces a table-like formatted output, as follows:

- First row reports the identifying name of the 'columns'
#MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN<CR><LF>
- Second row reports a complete set of GSM-related information for the serving cell:
#MONI: S: <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value> <timadv> <qual>
<netname><CR><LF>
- 3rd to 8th rows report a reduced set of GSM-related information for the cells in the neighbors:
#MONI: N<n> <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value>[<CR><LF>]

where:

<C1value>	C1 reselection parameter.
<C2value>	C2 reselection parameter.
Other parameters are described earlier.	

Note: Currently, AT#MONI=7 is only available in case of GSM network.

Notes

- The measures refresh time is preset to 3 seconds.
- The timing advance value is meaningful only during calls or GPRS transfers active.
- The serving cell is the current serving cell or the last available serving cell, if the module loses coverage.

Examples

Set command selects the cell 0

```
at#moni=0
```

OK

Execute command reports GSM-related information for cell 0

```
at#moni
```

```
#MONI: I WIND BSIC:70 RxQual:0 LAC:55FA Id:1D23 ARFCN:736 PWR:-83dbm TA:1
```

OK

Set command selects the special request to obtain GSM-related information from the whole set of seven cells in the neighbor list of the serving cell

```
at#moni=7
```

OK

Execute command reports the requested information in table-like format

```
at#moni
```

#MONI:	Cell	BSIC	LAC	CellId	ARFCN	Power	C1	C2	TA	RxQual	PLMN
#MONI:	S	70	55FA	1D23	736	-83dbm	19	33	1	0	I WIND
#MONI:	N1	75	55FA	1297	983	-78dbm	26	20			
#MONI:	N2	72	55FA	1289	976	-82dbm	22	16			
#MONI:	N3	70	55FA	1D15	749	-92dbm	10	18			
#MONI:	N4	72	55FA	1D0D	751	-92dbm	10	18			
#MONI:	N5	75	55FA	1296	978	-95dbm	9	3			
#MONI:	N6	70	55FA	1D77	756	-99dbm	3	11			

OK

Serving Cell Information #SERVINFO

Execute command reports information about serving cell, in the format:

```
#SERVINFO: <B-ARFCN>,<dBm>,<NetNameAsc>,<NetCode>,<BSIC>,<LAC>,<TA>,<GPRS>[, [<PB-ARFCN>], [<NOM>], [<RAC>], [<PAT>]]
```

where:

<B-ARFCN>	BCCH ARFCN of the serving cell.
<dBm>	Received signal strength in dBm.
<NetNameAsc>	Operator name, quoted string type.
<NetCode>	Country code and operator code, hexadecimal representation.
<BSIC>	Base Station Identification Code.
<LAC>	Localization Area Code.
<TA>	Time Advance: it's available only if a GSM or GPRS is running.
<GPRS>	GPRS supported in the cell.
0	Not supported.
1	Supported.

The following information appears if GPRS is supported in the cell:

<PB-ARFCN>	If PBCCH is supported by the cell, PBCCH ARFCN of the serving cell otherwise the label "hopping" is printed.
<NOM >	Network Operation Mode
"I"	
"II"	
"III"	
<RAC>	Routing Area Color Code

<PAT> Priority Access Threshold

0

3-6

During a call, a SMS sending/receiving or a location update the value of <GPRS>, <PB-ARFCN>, <NOM>, <RAC> and <PAT> parameters do not make sense.

Test command tests for command existence.

Syntax

Command	Command type
AT#SERVINFO	Execute
AT#SERVINFO=?	Test

Network Survey of Timing Advance #CSURVTA

Execute command performs a quick survey of timing advance through the given channels.

Test command response if OK.

Syntax

Command	Command type
AT#CSURVTA=<ch1>,[<ch2>,[...[,<chn>]]]	Set
AT#CSURVTA?	Read
AT#CSURVTA=?	Test

Parameters and Values

<chn> Channel number (arfcn).

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of timing advance values, one for each received carrier, is reported, each of them in the format:

arfcn: <arfcn> TA: <TAValue><CR><LF><CR><LF><CR><LF>

where:

<arfcn> - decimal number; it is the RF channel

<TAValue> - decimal number; it is the timing advance value in bit periods (1 bit period = 48/13 μs); the range of this value is 0-63; this value is -1 if time advance measurement fails

Lastly, the #CSURVTA output ends in two ways, depending on the last #CSURVF setting:

if #CSURVF=0 or #CSURVF=1

The output ends with the string:

Network survey ended

If #CSURVF=2
the output ends with the string:

Network survey ended (Carrier: <NoARFCN> BCCh: 0)

where
<NoARFCN> - number of scanned frequencies.

Notes

- The maximum number of channels is 20.
- During command execution, incoming or outgoing calls and SMS are not supported.
- After the end of this command, wait at least 5 seconds before sending other AT commands.
- This command can only be executed when mobile is in idle state.
- It is possible to measure timing advance of cells that do not belong to current selected PLMN or current neighbor cell list.
- If serving cell-timing advance is needed, measure its timing advance with this command, adding serving cell ARFCN to the list, in order to have even measures.
- The command may be aborted and return ERROR in case of higher priority protocol stack event.
- AT#CSURVNLF configuration affects this command behavior.
- AT#CSURVEXT configuration does not affect this command behavior.

Example

```
AT#CSURVTA=9,7,4
```

```
Network survey started ...
```

```
arfcn: 9 TA: 2
```

```
arfcn: 7 TA: 11
```

```
arfcn: 4 TA: 2
```

```
Network survey ended
```

```
OK
```

Example with AT#MONI and AT#CSURVTA

To show various channel numbers ARFCN that are detected.

```
AT#MONI=7
```

```
OK
```

```
AT#MONI
```

#MONI: Cell	BSIC	LAC	CellId	ARFCN	Power	C1	C2	TA	RxQual	PLMN
#MONI: S	50	7474	4F8A	669	-88dbm	18	18	0	0	T-Mobile
#MONI: N1	76	7474	7AA0	668	-93dbm	13	7			
#MONI: N2	60	7474	4F8B	671	-99dbm	7	1			
#MONI: N3	70	746F	5355	680	-101dbm	5	-1			

```
#MONI: N4      40  747B  760D      678  -104dbm  0  -6
#MONI: N5      FF  FFFF  0000      679   -97dbm -1  -1
#MONI: N6      FF  FFFF  0000      673   -98dbm -1  -1
OK
```

Once cell IDs are known, do a network survey for cell neighbor with Channel Numbers ARFCN of 669,668 & 671
 AT#CSURVTA=669,668,671

Network survey started ...

```
arfcn: 669 TA: 2
```

```
arfcn: 668 TA: -1
```

```
arfcn: 671 TA: 2
```

Network survey ended

OK

Query SIM Status #QSS

Set command enables or disables the Query SIM Status unsolicited indication in the ME.

Read command reports whether the unsolicited indication #QSS is currently enabled or not, along with the SIM status, in the format:

```
#QSS: <mode>,<status>
```

The sections that follow describe <mode> and <status>.

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#QSS=[<mode>]	Set
AT#QSS?	Read
AT#QSS=?	Test

Parameters and Values

<mode>	Notification type.
0	Disabled. You can only query the current SIM status through Read command AT#QSS?. Default: 0.
1	Enabled. The ME informs at every SIM status change through the following basic unsolicited indication: #QSS: <status> where: <status> - current SIM status 0 - SIM NOT INSERTED 1 - SIM INSERTED
2	Enabled. The ME informs at every SIM status change through the following unsolicited indication:

#QSS: <status>

where:

<status> - current SIM status

0 - SIM NOT INSERTED

1 - SIM INSERTED

2 - SIM INSERTED and PIN UNLOCKED

3 - SIM INSERTED and READY. SMS and Phonebook access are possible.

Note: The command reports the SIM status change after the <mode> is set to 2. It is recommended to set <mode>=2 and save the value in the user profile, then power off the module. The proper SIM status is available at the next power on.

ATD Dialing Mode #DIALMODE

Set command sets dialing modality.

Read command returns current ATD dialing mode in the format:

#DIALMODE: <mode>

Test command returns the range of values for <mode>.

Syntax

Command	Command type
AT#DIALMODE=<mode>]	Set
AT#DIALMODE?	Read
AT#DIALMODE=?]	Test

Parameters and Values

<mode>

- 0** Voice call only. OK result code is received as soon as it starts remotely ringing.
Default: 0.
- 1** Voice call only. OK result code is received only after the call is connected. Any character typed aborts the call and OK result code is received.
- 2** Voice call and data call. The following custom result codes are received, monitoring step by step the call status:
DIALING (MO in progress)
RINGING (remote ring, not supported in CDMA)
CONNECTED (remote call accepted)
RELEASED (after ATH)
DISCONNECTED (remote hang-up)

Notes

- If a BUSY tone is received and at the same time ATX0 is enabled ATD will return NO CARRIER instead of DISCONNECTED.
- Setting is saved in non-volatile memory and available after reboot.

Automatic Call #ACAL

Set command enables or disables the automatic call function.

Read command reports whether the automatic call function is currently enabled or not, in the format:

#ACAL: <mode>

Note: With the introduction of the command #ACALEXT (Extended Automatic Call) it is possible that the Read Command returns a value supported by #ACALEXT but NOT supported by #ACAL.

AT#ACAL?

#ACAL: 0

OK

As such, it is strongly recommended that you do not to use both commands at the same time.

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#ACAL=[<mode>]	Set
AT#ACAL?	Read
AT#ACAL=?	Test

Parameters and Values

<mode>

- | | |
|----------|---|
| 0 | Disables the automatic call function. Default: 0. |
| 1 | Enables the automatic call function. If enabled (and &D2 is issued), the transition OFF/ON of DTR causes an automatic call to the first number (position 0) stored in the internal phonebook. |

Notes

- Type of call depends on the last issue of command +FCLASS.
- Do not use #ACALEXT and #ACAL at the same time, because issuing #ACALEXT causes the #ACAL <mode> to change to 2, which is not supported by #ACAL.
- See &Z to write and &N to read the number on module internal phonebook.

Extended Automatic Call #ACALEXT

Set command enables or disables the extended automatic call function.

Read command reports either whether the automatic call function is currently enabled or not, and the last <index> setting in the format:

#ACALEXT: <mode>,<index>

Test command returns the available values range for <mode> and <index>.

- <mode>
- <index> when the ME is the chosen phonebook.
- <index> when SM is the chosen phonebook.

Syntax

Command	Command type
AT#ACALEXT=<mode>,<index>	Set
AT#ACALEXT?	Read
AT#ACALEXT=?	Test

Parameters and Values

<mode>

- 0** Disables the automatic call function. **Default: 0.**
- 1** Enables the automatic call function from **ME** phonebook.
- 2** Enables the automatic call function from **SM** phonebook.

<index>

Indicates a position in the currently selected phonebook.
If the extended automatic call function is enabled and &D2 is issued, the transition OFF/ON of DTR causes an automatic call to the number stored in position <index> in the selected phonebook.

Notes

- Type of call depends on the last issue of command +FCLASS
- Do not use #ACALEXT and #ACAL at the same time, because issuing #ACALEXT causes the #ACAL <mode> to change to 2, which is not supported by #ACAL.
- See &Z to write and &N to read the number on module internal phonebook.

Example

AT#ACALEXT?

#ACALEXT: (0 , 1) , (0 - 9)

Extended Call Monitoring #ECAM

This command enables or disables the call monitoring function in the ME.

Read command reports whether the extended call monitoring function is currently enabled or not, in the format:

#ECAM: <onoff>

Test command returns the list of supported values for <onoff>

Syntax

Command	Command type
AT#ECAM=[<onoff>]	Set
AT#ECAM?	Read
AT#ECAM=?	Test

Parameters and Values

<onoff>

- 0** Disables call monitoring function. **Default: 0.**
- 1** Enables call monitoring function; the ME informs about call events, such as incoming call, connected, hang up and so on using the following unsolicited indication:
#ECAM: <ccid>,<ccstatus>,<calltype>,,,[<number>,<type>]
where
<ccid> - call ID
<ccstatus> - call status
0 - Idle
1 - Calling (MO)
2 - Connecting (MO)
3 - Active
4 - Hold
5 - Waiting (MT)
6 - Alerting (MT)
7 - Busy
<calltype> - call type
1 - Voice
2 - Circuit switched data
<number> - called number (valid only for <ccstatus>=1)
<type> - Type of <number>
129 - National number
145 - International number
Note: The unsolicited indication is sent along with usual codes (OK, NO CARRIER, BUSY...)

SMS Overflow #SMOV

Set command enables or disables the SMS overflow signaling function.

Read command reports whether the SMS overflow signaling function is currently enabled or not, in the format:

#SMOV: <mode>

Test command returns the supported range of values of <mode>.

Syntax

Command	Command type
AT#SMOV=[<mode>]	Set
AT#SMOV?	Read
AT#SMOV=?	Test

Parameters and Values

<mode>

0

Disables SMS overflow signaling function. **Default: 0.**

1

Enables SMS overflow signaling function; when the maximum storage capacity is reached, the following network initiated notification is sent:

#SMOV: <memo>

Where <memo> is a string indicating the SMS storage that has reached maximum capacity:

"SM" – SIM Memory

Mailbox Numbers #MBN

Execute command returns the mailbox numbers stored on SIM, if this service is provided by the SIM.

The response format is:

[#MBN: <index>,<number>,<type>[,<text>][,mboxtype][<CR><LF>

#MBN: <index>,<number>,<type>[,<text>][,mboxtype][...]]]

where:

<index>

Record number.

<number>

String type, mailbox number in the format <type>.

<type>

Type of mailbox number octet in integer format.

129

National numbering scheme.

145

International numbering scheme. Contains the character "+".

<text>

The alphanumeric text associated to the number. Character set used is the one selected with command +CSCS.

<mboxtype>

The message waiting group type of the mailbox, if available.

"VOICE"

"FAX"

"EMAIL"

"OTHER"

Test command returns the OK result code.

Syntax

Command	Command type
AT#MBN	Execute
AT#MBN=?	Test

Notes

- If all queried locations are empty but available, no information text lines are returned.

Message Waiting Indication #MWI

Set command enables or disables the presentation of the message waiting indicator URC

Read command reports whether the presentation of the message waiting indicator URC is currently enabled or not, and the current status of the message waiting indicators as they are currently stored on SIM. The format is:

```
#MWI: <enable>,<status>[,<indicator>[,<count>]][<CR><LF>
```

```
#MWI: <enable>,<status>,<indicator>[,<count>][...]]
```

Test command returns the range of available values for parameter <enable>.

Syntax

Command	Command type
AT#MWI=<enable>	Set
AT#MWI?	Read
AT#MWI=?	Test

Parameters and Values

<enable>

0

Disable the presentation of the #MWI URC.

1

Enable the presentation of the #MWI URC each time a new message waiting indicator is received from the network and, at startup, the presentation of the status of the message waiting indicators, as they are currently stored on SIM. The URC format is:

```
#MWI: <status>,<indicator>[,<count>]
```

where:

<status>

0 – Clear. Deleted one of the messages related to the indicator <indicator>.

1 – Set. New waiting message related to the indicator <indicator>.

<indicator>

1 - either Line 1 (CPHS context) or Voice (3GPP context)

2 - Line 2 (CPHS context only)

3 - Fax

4 - E-mail

5 - Other

<count> - Message counter. Network information reporting the number of pending messages related to the message waiting indicator <indicator>.

The presentation at startup of the message waiting indicators status, as they are currently stored on SIM, is as follows:

```
#MWI: <status>[,<indicator>[,<count>]][<CR><LF>
```

```
#MWI: <status>,<indicator>[,<count>][...]]
```

where:

<status>

0 - No waiting message indicator is currently set: if this the case no other information is reported

1 - There are waiting messages related to the message waiting indicator

<indicator>.

<indicator>

1 - Either Line 1 (CPHS context) or Voice (3GPP context)

2 - Line 2 (CPHS context)

3 - Fax

4 - E-mail

5 - Other

<count> - Message counter. Number of pending messages related to the message waiting indicator <indicator> as it is stored on SIM.

Audio Codec #CODEC

Set command sets the audio codec mode.

Read command returns current audio codec mode in the format:

#CODEC: <codec>

Test command returns the range of available values for <codec>.

Syntax

Command	Command type
AT#CODEC=[<codec>]	Set
AT#CODEC?	Read
AT#CODEC=?	Test

Parameters and Values

<codec>

0

All the codec modes are enabled. **Default: 0.**

1-31

Some sum of integers each representing a specific codec mode.

1 - FR, full rate mode enabled

2 - EFR, enhanced full rate mode enabled

4 - HR, half rate mode enabled

8 - AMR-FR, AMR full rate mode enabled

16 - AMR-HR, AMR half rate mode enabled

Note

- The full rate mode is added by default to any setting in the SETUP message (as specified in ETSI 04.08), but the call drops if the network assigned codec mode has not been selected by the user.
- Setting 0 is equivalent to setting 31.
- This setting is saved in profile parameters.

Example

AT#CODEC=14

OK

Sets the codec modes HR (4), EFR (2) and AMR-FR (8)

Network Timezone #NITZ

Set command enables or disables automatic date/time updating, Full Network Name applying and #NITZ URC. It allows changes to the #NITZ URC format. The network can send date and time information after GSM registration or after GPRS attach.

Read command reports whether automatic date/time updating, Full Network Name applying, and #NITZ URC (as well as its format) are currently enabled or not, in the format:

#NITZ: <val>,<mode>

Test command returns supported values of <val> and <mode>.

Syntax

Command	Command type
AT#NITZ= [<val> [,<mode>]]	Set
AT#NITZ?	Read
AT#NITZ=?	Test

Parameters and Values

<val>

0 Disables automatic date/time updating, Full Network Name applying, and #NITZ URC. Sets the #NITZ URS basic format.

1 - 15 As a sum of:
 1 - Enables automatic date/time updating
 2 - Enables Full Network Name applying
 4 - Sets the #NITZ URC 'extended' format (see <datetime> below)
 8 - Sets the #NITZ URC 'extended' format with Daylight Saving Time (DST) support (see <datetime> below) **Default.**

<mode>

0 Disables #NITZ URC. **Default: 0.**

1 Enables #NITZ URC; after updating date and time, sends the following unsolicited indication:

#NITZ: <datetime>

where:

<datetime> - string whose format depends on subparameter <val>

"yy/MM/dd,hh:mm:ss" - 'basic' format, if <val> is in (0..3)

"yy/MM/dd,hh:mm:ss±zz" - 'extended' format, if <val> is in (4..7)

"yy/MM/dd,hh:mm:ss±zz,d" - 'extended' format with DST support, if <val> is in (8..15)

where:

yy - year

MM - month (in digits)

dd - day

hh - hour

mm - minute

ss - second

zz - time zone (indicates the difference between local and GMT time, expressed in quarter hours; two last digits are mandatory, range is -47..+48)

d – number of hours added to the local TZ because of Daylight Saving Time (summertime) adjustment; range is 0-3.

Notes

- If the network doesn't send the DST information, then the <datetime> parameter has the format "yy/MM/dd, hh:mm:ss±zz".

Example

```
AT#NITZ?
#NITZ: 7,0
OK
```

Enhanced Network Selection #ENS

Set command activates the ENS functions.

Read command reports whether the ENS function is currently enabled or not, in the format:

#ENS: <mode>

where <mode> represents values as described in Parameters and Values.

Test command reports the available range of values for parameter <mode>.

Syntax

Command	Command type
AT#ENS=[<mode>]	Set
AT#ENS?	Read
AT#ENS=?	Test

Parameters and Values

<mode>

- | | |
|--------------------------|---|
| 0

1 | Disable ENS function. Default: 0.

Enable ENS function. If AT#ENS=1 is issued, the following values are automatically set:
At every next power-up <ol style="list-style-type: none"> a. Band GSM 850 and PCS enabled (AT#BND=3) b. SIM Application Toolkit enabled on user interface 0 if not previously enabled on a different user interface (AT#STIA=2) Just at first next power-up <ol style="list-style-type: none"> a. Automatic Band Selection enabled (AT#AUTOBND=2) only if the previous setting was equal to AT#AUTOBND=0 b. PLMN list not fixed (AT#PLMNMODE=1). |
|--------------------------|---|

Notes

- The new setting will be available just at first next power-up.
- If 'Four Band' Automatic Band Selection has been activated (AT#AUTOBND=2), at power-up the value returned by AT#BND? could be different from 3 when ENS functionality is enabled.

Select Band #BND

Set command selects the current band.

Read command returns the current selected band in the format:

#BND: <band>

Test command returns the supported range of values for <band>.

Syntax

Command	Command type
AT#BND=[<band>]	Set
AT#BND?	Read
AT#BND=?	Test

Parameters and Values

<band>

- 0** GSM 900MHz + DCS 1800MHz. **Default: 0.**
- 1** GSM 900MHz + PCS 1900MHz. This value is not available if the ENS function is activated. See #ENS.
- 2** GSM 850MHz + DCS 1800MHz. This value is not available if the ENS function is activated. See #ENS.
- 3** GSM 850MHz + PCS 1900MHz. Available only on quad-band modules.

Notes

- This setting is maintained after power off.
- If the normal automatic band selection is enabled (AT#AUTOBND=1) then the last #BND settings can automatically change at power-up. After this change, you can use the command as you normally do.
- If the 'four bands' automatic band selection is enabled (AT#AUTOBND=2) then you can issue AT#BND=<band> but it has no functional effect. Nevertheless, every following read command AT#BND? reports that setting.

Automatic Band Selection #AUTOBND

Set command enables or disables the automatic band selection at power-on.

Read command returns whether the automatic band selection is enabled or not in the form:

#AUTOBND: <value>

Test command returns the range of supported values for <value>.

Syntax

Command	Command type
AT#AUTOBND=[<value>]	Set
AT#AUTOBND?	Read
AT#AUTOBND=?	Test

Parameters and Values

<value>

- 0** Disables automatic band selection at next power-up.
- 1** Enables automatic band selection at next power-up. The automatic band selection stops as soon as a GSM cell is found (deprecated).
- 2** Enables automatic band selection in four bands (at 850/1900 and 900/1800); differently from previous settings it takes immediate effect. **Default: 2.**

Notes

- Necessary condition to effectively have automatic band selection at next power-up (due to either AT#AUTOBND=1 or AT#AUTOBND=2) is that AT+COPS=0 has to be previously issued.
- If automatic band selection is enabled (AT#AUTOBND=1) the band changes every about 90 seconds through available bands until a GSM cell is found.
- If the current setting is equal to AT#AUTOBND=0 and you issue AT#ENS=1, at first next power-up after the ENS is activated (see #ENS) the automatic band selection (AT#AUTOBND=2) is enabled.

Lock to Single Band #BNDLOCK

Set command sets the single band the device must be locked to selectable within those allowed for the specific product.

Read command reports the currently stored <LockedBand>, in the format:

#BNDLOCK: <LockedBand>

Test command reports the range of supported values for <LockedBand> according to specific product.

Syntax

Command	Command type
AT#BNDLOCK=[<type>]	Set
AT#BNDLOCK?	Read
AT#BNDLOCK=?	Test

Parameters and Values

<LockedBand>

- 0** Disables band locking. **Default: 0.**
- 1** Enables band locking on GSM 900MHz;
- 2** Enables band locking on DCS 1800MHz;
- 3** Enables band locking on GSM 850MHz;
- 4** Enables band locking on PCS 1900MHz.

Notes

- The value set by #BNDLOCK is directly stored in non-volatile memory. It doesn't depend on the specific CMUX instance.
- Setting changes take effect after a new network registration procedure.
 - A power cycle (power-off and power-on the device) after changing settings is strongly recommended.
 - Otherwise, leave the device on and force a new network registration as in the following example:
Set AT+COPS=1,2,00001 (manual registration to not existing real network)

Wait for +CREG: 0,3

Set AT+COPS=0,0 (for automatic registration) or set AT+COPS=1,0,... (for manual registration)

- With AT#AUTOBND=0, there may be conflicts between AT#BND and AT#BNDLOCK stored values. The user is responsible for setting proper values to avoid conflicts (no crosscheck is available between the two commands).

Skip Escape Sequence #SKIPESC

Set command enables or disables skipping the escape sequence +++ while transmitting during a data connection.

Read command reports whether escape sequence skipping is currently enabled or not, in the format:

#SKIPESC: <mode>

Test command reports supported range of values for <mode>.

Syntax

Command	Command type
AT#SKIPESC=<mode>]	Set
AT#SKIPESC?	Read
AT#SKIPESC=?]	Test

Parameters and Values

<mode>

- | | |
|----------|--|
| 0 | Does not skip the escape sequence; its transmission is enabled. Default: 0. |
| 1 | Skips the escape sequence; its transmission is not enabled. |

Notes

- In case of an FTP connection, the escape sequence is not transmitted, regardless of the command setting.

Escape Sequence Guard Time #E2ESC

Set command sets a guard time in seconds for the escape sequence in GPRS to be considered a valid one (and return to online command mode).

Read command reports whether escape sequence skipping is currently enabled or not, in the format:

#E2ESC: <gt>

Test command returns the OK result code.

Syntax

Command	Command type
AT#E2ESC=<gt>]	Set
AT# E2ESC?	Read
AT#E2ESC=?]	Test

Parameters and Values

<gt>

0	Guard time defined by command S12. Default: 0.
1-10	Guard time in seconds

Notes

- If the Escape Sequence Guard Time is set to a value other than zero, it overrides the one set with S12.

PPP-GPRS Connection Authentication Type #GAUTH

Set command sets PPP-GPRS or PPP-GSM connection authentication type.

Read command reports the current PPP-GPRS authentication type, in the format:

#GAUTH: <type>

Test command returns the range of supported values for parameter <type>.

Syntax

Command	Command type
AT#GAUTH=<type>]	Set
AT#GAUTH?	Read
AT#GAUTH=?]	Test

Parameters and Values

<type>

0	No authentication.
1	PAP authentication. Default: 1.
2	CHAP authentication.
3	Automatic (PAP and CHAP).

PPP-GPRS Parameters Configuration #GPPPCFG

Set command sets three parameters for a PPP-GPRS connection.

Read command reports the current PPP-GPRS connection parameters, in the format:

#GPPPCFG: <hostIpAddress>,<LCPTimeout>,<PPPmode>

Test command returns the range of supported values for <LCPTimeout> and <PPPmode>, in the format:

#GPPPCFG: (10-600),(0-3)

Syntax

Command	Command type
AT#GPPPCFG=<hostIpAddress>[,<LCPTimeout>[,<PPPmode>]]	Set
AT#GPPPCFG?	Read
AT#GPPPCFG=?]	Test

Parameters and Values

<hostIPAddress>	Host IP Address assigned to the PPP server side (the host application); Sstring type, it can be any valid IP address in the format: xxx.xxx.xxx.xxx.
<LCPtimeout>	LCP response timeout value in 100ms units.
10-600	Hundreds of ms. Default: 25.
<PPPmode>	PPP mode.
0	Passive mode. The module waits for the first message coming from the remote application (for example LCP Conf Req) before starting the LCP negotiation. Default: 0.
1	Active mode. The module starts the LCP negotiation autonomously immediately after the CONNECT message.
2	Passive mode. The module waits for the first message coming from the remote application (for example LCP Conf Req) before starting the LCP negotiation. The module performs LCP termination.
3	Active mode. The module starts the LCP negotiation autonomously immediately after the CONNECT message. The module performs LCP termination.

Notes

- If the <hostIPAddress>="0.0.0.0" (factory default), the Host IP Address assigned to the host application is the previous remote IP Address obtained by the network.

Enables/Disables PPP Compression # GPPPCFGEXT

Set command sets PPP-GPRS or PPP-GSM connection authentication type.

Read command reports the current PPP-GPRS authentication type, in the format:

#GPPPCFGEXT: <Comp>,0,0,0<CR><LF>

Test command returns the range of supported values all parameters.

Syntax

Command	Command type
AT#GPPPCFGEXT=<Comp>[,<unused_A>[,<unused_B>[,<unused_C>]]]	Set
AT#GPPPCFGEXT?	Read
AT#GPPPCFGEXT=?	Test

Parameters and Values

<Comp>	
0	Disables compression
1	Enables compression. Default: 1.

RTC Status #RTCSTAT

Set command resets the RTC status flag.

Read command reports the current value of RTC status flag, in the format:

#RTCSTAT: <status>

Test command returns the range of supported values for parameter <status>.

Syntax

Command	Command type
AT#RTCSTAT=[<status>]	Set
AT#RTCSTAT?	Read
AT#RTCSTAT=?	Test

Parameters and Values

<status>

0

Set RTC status to RTC HW OK.

Notes

- The initial value of the RTC status flag is RTC HW Error and it doesn't change until a command AT#RTCSTAT=0 is issued.
- If a power failure occurs and the buffer battery is down, the RTC status flag is set to 1. It doesn't change until command AT#RTCSTAT=0 is issued.

GSM Antenna Detection #GSMAD

Set command sets the behavior of the antenna detection algorithm.

Read command returns the current parameter settings for #GSMAD command in the format:

#GSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>

Test command reports the supported range of values for parameter <mod>, <urcmode>, <interval>, <detGPIO> and <repGPIO>.

Syntax

Command	Command type
AT#GSMAD=<mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>]]]]	Set
AT#GSMAD?	Read
AT#GSMAD=?	Test

Parameters and Values

<mod>

0

Antenna detection algorithm not active.

1

Periodically activates the antenna detection algorithm. Detection starts every <interval> period. If the algorithm detects an antenna status change, URC #GSMAD notifies the module.

URC format:

#GSMAD: <presence>

where:

<presence>

0 - antenna connected.

1 - antenna connector short circuited to ground.

2 - antenna connector short circuited to power.

3 - antenna not detected (open).

2 This option is obsolete. Use 3 instead.

3 Instantaneously activate the antenna detection algorithm. If the algorithm detects an antenna status change, URC #GSMAD notifies the module. The command does not return until the algorithm ends.

The returned value is the antenna <presence> status just detected in the format:

AT#GSMAD=3

#GSMAD: <presence>

OK

Instantaneous activation doesn't affect a periodic activation previously started. In this case, the output format is:

AT#GSMAD=3

#GSMAD: <presence>

OK

#GSMAD: <presence> // URC resulting of previous #GSMAD=1

<urcmode>

URC presentation mode. Can be set only if <mod> is 1.

0 Disables the antenna detection URC presentation.

1 Enables the antenna detection URC presentation whenever the algorithm detects a change in the antenna status. The unsolicited message is in the format:

#GSMAD: <presence>

where:

<presence> is as before

<interval>

The interval between two consecutive antenna detection algorithm runs (default is 120). It can be set only if <mod> is 1.

1-3600

Interval duration in seconds.

<detGPIO>

Not supported.

<reoGPIO>

Not supported.

Notes

- The URC presentation mode <urcmode> is related to the current AT instance only (see +cmux); last <urcmode> settings are saved for every instance as extended profile parameters, thus it is possible to restore them either if the multiplexer control channel is released and set up, back and forth.
- #GSMAD parameters, excluding <urcmode>, are saved in non-volatile memory.

SIM Detection Mode #SIMDET

Set command specifies the SIM Detection mode.

Read command returns the currently selected SIM Detection Mode in the format:

#SIMDET: <mode>,<simin>

where:

<mode>	SIM detection mode.
<simin>	SIMIN pin real status.
0	SIM not inserted.
1	SIM inserted.

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#SIMDET=<mode>	Set
AT#SIMDET?	Read
AT#SIMDET=?	Test

Parameters and Values

<mode>	SIM detection mode.
0	Ignore SIMIN pin and simulate the status 'SIM Not Inserted'.
1	Ignore SIMIN pin and simulate the status 'SIM Inserted'.
2	Automatic SIM detection through SIMIN pin. Default: 2.

SIM Enhanced Speed #ENHSIM

Set command activates or deactivates the SIM enhanced speed function.

Read command returns whether the SIM Enhanced Speed Functionality is currently activated or not, in the format:

#ENHSIM: <mod>

Test command reports the supported range of values for <mod>.

Syntax

Command	Command type
AT#ENHSIM=<mod>	Set
AT#ENHSIM?	Read
AT#ENHSIM=?	Test

Parameters and Values

<mod>	
0	Not Active.
1	BRF is (F=512 D=8). Default: 1.

Notes

- Verify which is the maximum speed supported by the final application.
- Value <mod> is saved in the non-volatile memory until new SIM insertion.
- Module uses the slowest speed between the one programmed and the one supported by the SIM.
- For BRF definition, refer to ISO-7816-3.
- Reference GSM 11.11, ISO-7816-3.

Subscriber number #SNUM

Set command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file.

Test command returns the OK result code.

CAUTION: If using the SIM card with other devices, do not use #SNUM.

Syntax

Command	Command type
AT#SNUM=<index>,<number>[,<alpha>]	Set
AT#SNUM=?	Test

Parameters and Values

<index>	Record number. The EFmsisdn number of record depends on the SIM. If the ENS functionality is not enabled (see #ENS), <index>=1 is the only value allowed. If only <index> value is given, the EFmsisdn record in location <index> is deleted.
<number>	String containing the phone number. May be written between quotes. If the ENS functionality is enabled (see #ENS) "+" at start only is also admitted (international numbering scheme).
<alpha>	Alphanumeric string associated to <number>. Default value is empty string (""), otherwise, character set should be the one selected with +CSCS. May be written between quotes. The number of characters depends on the SIM. If empty string is given (""), the corresponding <alpha> will be an empty string. Default: "" .

Notes

- Returns ERROR if EFmsisdn file is not present in the SIM or if MSISDN service is not allocated and activated in the SIM Service Table (see 3GPP TS 11.11).
-

SIM Answer to Reset #SIMATR

This command returns the characters collected from the Reset/ATR procedure.

Syntax

Command	Command type
AT#SIMATR	Test

Notes

- The ATR is the information presented by the SIM to the ME at the beginning of the card session and gives operational requirements (ISO/IEC 7816-3).

CPU Clock Mode #CPUMODE

Set command specifies the CPU clock mode.

Read command returns the currently selected CPU clock mode in the format:

#CPUMODE: <mode>

Test command reports the support range of values for <mode>.

Syntax

Command	Command type
AT#CPUMODE=<mode>	Set
AT#CPUMODE?	Read
AT#CPUMODE=?	Test

Parameters and Values

<mode>	CPU clock mode.
0	Normal CPU clock @26Mhz
1	CPU clock @52Mhz
2	CPU clock @52Mhz, during GPRS TX/RX only
3	CPU clock @104Mhz
4	CPU clock @104Mhz, during GPRS TX/RX only

Notes

- Setting <mode> greater than 0 increases power consumption.

GSM Context Definition #GSMCONT

Set command specifies context parameter values for the only GSM context, identified by the (local) context identification parameter 0.

Read command returns the current settings for the GSM context, if defined, in the format:

+GSMCONT: <cid>,<P_type>,<CSD_num>

Test command returns the supported range of values for all the parameters.

Syntax

Command	Command type
AT#GSMCONT=<cid>[,<P_type>,<CSD_num>]	Set
AT#GSMCONT?	Read
AT#GSMCONT=?	Test

Parameters and Values

<cid>	Context Identifier; numeric parameter which specifies the only GSM context.
0	Note: Issuing #GSMCONT=0 causes the values for context number 0 to become undefined.
	Note: Command not yet implemented.

<P_type>	Protocol type; a string parameter, which specifies the type of protocol "IP" (Internet Protocol).
<CSD_num>	Phone number of the internet service provider.

IPEGSM #GSMCONTCFG

Set command sets the IPEGSM configuration.

Read command returns the current configuration parameters, in the format:

```
#GSMCONTCFG:<actTo>,0,0,0<CR><LF>
```

Test command returns the supported range of values for all the subparameters.

Syntax

Command	Command type
AT#GSMCONTCFG=<actTo>[,<unused_A>[,<unused_B>[,<unused_C>]]]	Set
AT#GSMCONTCFG?	Read
AT#GSMCONTCFG=?	Test

Parameters and Values

<actTo>	Activation timer value. This timeout starts as soon as the PPP activation starts. It does not include the time for the CSD call to be established.
0	No timer. Default: 0.
50-65535	Timeout value in hundreds of milliseconds.

Notes

- This value is stored in non-volatile memory and doesn't depend on the specific AT instance.
- Timeout starts as soon as PPP activation starts. It does not include the time for the CSD call to be established.

Show Address #CGPADDR

Execute command returns either the IP address for the GSM context (if specified) or a list of PDP addresses for the specified PDP context identifiers.

Test command returns a list of defined <cid>s.

Syntax

Command	Command type
AT#CGPADDR=[<cid>[,<cid>[,...]]]	Execute
AT#CGPADDR=?	Test

Parameters and Values

<cid>	Context identifier.
0	Specifies the GSM context. See +GSMCONT.
1-5	Numeric parameter, which specifies a particular PDP context definition. See +CGDCONT command.

Notes

- If no <cid> is specified, the addresses for all defined contexts are returned.
- Issuing the command with more than 6 parameters raises an error.
- The command returns only one row of information for every specified <cid>, even if the same <cid> is present more than once.
- The command returns a row of information for every specified <cid> whose context is already defined. No row is returned for a <cid> whose context has not been defined yet. Response format is:

#CGPADDR: <cid>,<address>[<CR><LF>

#CGPADDR: <cid>,<address>[...]]

where:

<cid>

Context identifier.

<address>

Meaning depends on the value of <cid>.

- If <cid> is the (only) GSM context identifier (<cid>=0) it is the dynamic address assigned during the GSM context activation.
- If <cid> is a PDP context identifier (<cid> in (1-5)) it is a string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it is the one set by the +CGDCONT command when the context was defined. For a dynamic address, it is the one assigned during the last PDP context activation that used the context definition referred to by <cid>.
- If no address is available the empty string ("") is represented as <address>.

Examples

```
AT#SGACT=0,1
```

```
#SGACT: xxx.yyy.zzz.www
```

```
OK
```

```
AT#CGPADDR=0
```

```
#CGPADDR: 0,"xxx.yyy.zzz.www"
```

```
OK
```

```
AT#CGPADDR=?
```

```
#CGPADDR: (0)
```

```
OK
```

Network Scan Time **#NWSCANTMR**

Set command sets the Network Scan Timer to schedule the next network search when the module does not have a network signal (no signal).

Execute command reports the time in seconds when the next scan activity will be executed, in the format:

#NWSCANTMR:<time>

Read command reports the current parameter settings in the format:

#NWSCANTMR: <tmr>

Test command reports the supported range of values for <tmr>.

Syntax

Command	Command type
AT#NWSCANTMR=<tmr>	Set
AT#NWSCANTMR	Execute
AT#NWSCANTMR?	Read
AT#NWSCANTMR=?	Test

Parameters and Values

<tmr> Timer value in seconds.
5-3600 **Default: 5.**

Notes

- If <time> is zero, the timer is not running.
- How long it takes to scan the network depends on either how many bands were selected or the network configuration (mean value is 5 seconds).

Call Establishment Lock **#CESTHLCK**

Use this command to disable call abort before the DCE enters connected state.

Read command returns the current setting of <closure_type> parameter in the format:

#CESTHLCK: <closure_type>

Test command returns the supported range of values for <closure_type>.

Syntax

Command	Command type
AT#CESTHLCK=[<closure_type >]	Execute
AT#CESTHLCK?	Read
AT#CESTHLCK=?	Test

Parameters and Values

<closure_type>

- 0** Aborting the call setup by reception of a character is generally possible at any time before the DCE enters connected state. **Default: 0.**
- 1** Aborting the call setup is disabled until the DCE enters connected state.

Phone Activity Status #CPASMODE

Set command enable/disable a modified AT+CPAS command response when the command is issued before an incoming call starts ringing (RING unsolicited code sent to the TE). If the <mode> is 0, AT+CPAS response will be:

+CPAS: 4

otherwise, the response will be

+CPAS: 3

Read command returns the current <mode> in the format:

#CPASMODE:<mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#CPASMODE=<mode>	Set
AT#CPASMODE?	Read
AT#CPASMODE=?	Test

Parameters and Values

- <mode>** Response selection
- 0** Standard AT+CPAS response. **Default: 0.**
- 1** Modified AT+CPAS response.

Notes

- This value is stored directly in the non-volatile memory and doesn't depend on the specific AT instance.

ICCID SIM File Reading Mode #FASTCCID

Set command specifies the ICCID reading mode.

Read command returns the currently selected reading mode in the format:

#FASTCCID: <fast>

Test command returns the supported currently available <fast>s.

Syntax

Command	Command type
AT#FASTCCID=[<fast>]	Set
AT#FASTCCID?	Read
AT#FASTCCID=?	Test

Parameters and Values

<fast>	Numeric parameter that indicates the reading mode.
0	Reads the ICCID value from the SIM card each time the AT#CCID command is issued and not during SIM card initialization.
1	Reads the ICCID value from the SIM card during SIM card initialization. Default: 1.

Notes

- This value is saved in the non-volatile memory and goes into effect at the next power cycle.

Power Saving Mode Ring #PSMRI

Set command enables or disables the Ring Indicator pin response to an URC message while modem is in power saving mode.

If enabled, a negative going pulse is generated when URC message for specific event is invoked. The duration of this pulse is determined by the value of <x>.

Read command reports the duration in ms of the pulse generated, in the format:

#PSMRI: <x>

Test command reports the supported range of values for parameter <x> .

Syntax

Command	Command type
AT#PSMRI= <x>	Set
AT#PSMRI?	Read
AT#PSMRI=?	Test

Parameters and Values

<x>	RI enabling.
0	Disables RI pin response for URC message. Default: 0.
50-1150	Enables RI pin response for URC messages.

Notes

- To avoid missing of URC messages while modem is in power saving mode, enable flow control in command mode (AT#CFLO=1).
- #PSMRI behavior is invoked only when modem is in sleep mode (AT+CFUN=5 and DTR OFF on main UART).
- The value set is stored in the profile extended section and does not depend on the specific AT instance.
- When RING signal from incoming call/SMS/socket listen is enabled, the #PSMRI behavior is ignored.

Software Level Selection #SWLEVEL

Set command enables two enhanced features:

1. Allows faster indication of SIM status when the PIN isn't required (see #QSS).
2. Controls DTMF duration even for values shorter than 300 ms (see AT+VTS and AT+VTD).

Read command reports currently selected <level>, in the format:

#SWLEVEL: <level>

Test command reports the supported range of values for <level> .

Syntax

Command	Command type
AT#SWLEVEL=<level>	Set
AT#SWLEVEL?	Read
AT#SWLEVEL=?	Test

Parameters and Values

<level>	SW level.
0	Disables SW level.
1	Enables SW level. Default: 1.

Notes

- <level> is stored in the non-volatile memory and does not depend on the specific AT instance.
- DTMFs generate at the network level and real duration can be operator dependent.

Command Mode Flow Control #CFLO

Set command enables or disables the flow control in command mode. If enabled, current flow control is applied to both command and data modes.

Read command reports current setting value, in the format:

#CFLO: <mode>

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#CFLO= <mode>	Set
AT#CFLO?	Read
AT#CFLO=?	Test

Parameters and Values

<mode>	
0	Disables flow control set in command mode. Default: 0.
1	Enables flow control set in command mode.

Notes

- Setting value saved in profile.

Report Concatenated SMS Indexes #CMGLCONCINDEX

The command reports a line for each concatenated SMS containing:

#CMGLCONCINDEX: N,i,j,k,...

where

N The number of segments that form the whole concatenated SMS.
 i,j,k The SMS indexes of each SMS segment , 0 if segment has not been received.

If no concatenated SMS is present on the SIM, only OK result code is returned.

Test command returns OK result code.

Syntax

Command	Command type
AT#CMGLCONCINDEX	
AT#CMGLCONCINDEX=?	Test

Examples

```
at#cmglconcindex
```

```
#CMGLCONCINDEX: 3,0,2,3
```

```
#CMGLCONCINDEX: 5,4,5,6,0,8
```

```
OK
```

Codec Information #CODECINFO

This command is both a set and an execute command.

Set command enables or disables codec information reports depending on the parameter <mode>, in the specified <format>.

Read command reports <format> and <mode> parameter values in the format:

#CODECINFO: <format>,<mode>

Test command returns the range of supported <format> and <mode>.

Syntax

Command	Command type
AT#CODECINFO[=<format>[,<mode>]]	Set Execute
AT#CODECINFO?	Read
AT#CODECINFO=?	Test

Parameters and Values

<format>

- 0** Numeric format. **Default: 0.**
- 1** Text format.

<mode>

- 0** Disable codec information unsolicited report. **Default: 0.**
- 1** Enable codec information unsolicited report only if the codec changes.
- 2** Enable short codec information unsolicited report only if the codec changes.

If <mode>=1 the unsolicited channel mode information is reported in the following format:

(if <format>=0)

#CODECINFO: <codec_used>,<codec_set>

(if <format>=1)

#CODECINFO: <codec_used>,<codec_set1>

[,<codec_set2>[..`codec_setn`]]

If <mode>=2 the unsolicited codec information is reported in the following format:

#CODECINFO: <codec_used>

The reported values are described below.

Execute command

Execute command reports codec information in the specified <format>.

(if <format>=0)

#CODECINFO: <codec_used>,<codec_set>

(if <format>=1)

#CODECINFO: <codec_used>,<codec_set1>

[,<codec_set2>[..`codec_setn`]]

The reported values are:

(if <format>=0)

<codec_used> - one of the following channel modes:

- 0 – no TCH
- 1 - full rate speech 1 on TCH
- 2 - full rate speech 2 on TCH
- 4 - half rate speech 1 on TCH

8 - full rate speech 3 – AMR on TCH

16 - half rate speech 3 – AMR on TCH

128 – full data 9.6

129 – full data 4.8

130 – full data 2.4

131 – half data 4.8

132 – half data 2.4

133 – full data 14.4

<codec_set>

1..31 - sum of integers each representing a specific codec mode:

1 - FR, full rate mode enabled

2 - EFR, enhanced full rate mode enabled

4 - HR, half rate mode enabled

8 - FAMR, AMR full rate mode enabled

16 - HAMR, AMR half rate mode enabled

(if <format>=1)

<codec_used> - one of the following channel modes:

None – no TCH

FR - full rate speech 1 on TCH

EFR - full rate speech 2 on TCH

HR - half rate speech 1 on TCH

FAMR - full rate speech 3 – AMR on TCH

HAMR - half rate speech 3 – AMR on TCH

FD96 - full data 9.6

FD48 - full data 4.8

FD24 - full data 2.4

HD48 - half data 4.8

HD24 - half data 2.4

FD144 - full data 14.4

<codec_setn>

FR - full rate mode enabled

EFR - enhanced full rate mode enabled

HR - half rate mode enabled

FAMR - AMR full rate mode enabled

HAMR - AMR half rate mode enabled

Note: The command refers to codec information in a speech call and to channel mode in a data call.

If AT#CODEC is 0, the reported codec set for <format>=0 is 31 (all codec).

Second Interface Instance #SII

Set command activates one of the three available AT instances and assigns it to the ASCI serial port at a particular speed and format.

Read command reports the currently active parameter settings in the format:

#SII: <inst>[,<rate>,<format>,<parity>]

where <rate>,<format> and <parity> display only if <inst>= 1 or 2.

Test command reports the supported range of values for <inst>,<rate>,<format>,and <parity>.

Syntax

Command	Command type
AT#SII=<inst>[,<rate>[,<format>[,<parity>]]]	Set
AT#SII?	Read
AT#SII=?	Test

Parameters and Values

<inst>	Number that identifies the instance that will be activated on ASC1. Required.
0	Disable other AT instances and restores trace service. Default: 0.
1	Enables instance 1.
2	Enables instance 2.
<rate>	Set command specifies the DTE speed at which the device accepts commands during command mode operations. It may be used to fix the DTE-DCE interface speed. Only available if <inst>= 1 or 2.
300	
1200	
2400	
4800	
9600	
19200	
38400	
57600	
115200	Default: 115200.

<format>	Determine the number of bits in the data bits, the presence of parity bit, the number of stop bits in the start-stop frame. Default value only available if <inst>= 1 or 2. If <inst> is not 1 or 2, no default.
1	8 Data, 2 Stop.
2	8 Data, 1 Parity, 1 Stop.
3	8 Data, 1 Stop. Default: 3
5	7 Data, 1 Parity, 1 Stop.
<parity>	Determines how the parity bit is generated and checked. Available only if <inst>=1 or 2 and if <format>=2 or 5.
0	Odd.
1	Even.

Notes:

- Values stored directly in non-volatile memory and don't depend on the specific AT instance.
- Two sets of <rate>, <format> and <parity> parameters values are stored in non-volatile memory, one for instance 1 (<inst> = 1) and one for instance 2 (<inst> = 2). The <rate>, <format> and <parity> parameters values are ignored when <inst> parameter has value 0.
- ASC1 port doesn't support hardware flow control.

Select Language #LANG

Set command selects the currently used language for displaying different messages.

Read command reports the currently selected <lan> in the format:

#LANG: <lan>

Test command reports the supported range of values for parameter <lan>

Syntax

Command	Command type
AT#LANG=<lan>	Set
AT#LANG?	Read
AT#LANG=?	Test

Parameters and Values

<lan>	Selected language.
"en"	English. Default: "en" .
"it"	Italian.

Call Forwarding Flags #CFF

Set command enables or disables the presentation of the call forwarding flags URC.

Read command reports if the presentation of the call forwarding flags URC is enabled and, if the flags field is present in the SIM, the current status of the call forwarding flags as they are currently stored on SIM, and the number incoming calls are forwarded to. The format is:

#CFF: <enable>[,<status>,< fwdtonum >]

Test command returns the range of available values for parameter <enable>.

Syntax

Command	Command type
AT#CFF=<enable>	Set
AT#CFF?	Read
AT#CFF=?	Test

Parameters and Values

<enable>

- 0** Disable the presentation of the #CFF URC. **Default: 0.**
- 1** Enable the presentation of the #CFF URC each time the Call Forwarding Unconditional (CFU) SS setting is changed or checked and, at startup, the presentation of the status of the call forwarding flags, as they are currently stored on SIM.
- The URC format is:
 #CFF: <status>,<fwdtonum>
 where:
 <status>
 0 – CFU disabled
 1 – CFU enabled
- < fwdtonum > - number incoming calls are forwarded to
 The presentation at start up of the call forwarding flags status, as they are currently stored on SIM, is as follows:
 #CFF: <status>,< fwdtonum >
 where:
 <status>
 0 – CFU disabled
 1 – CFU enabled
 < fwdtonum > - number to which incoming calls are forwarded.

Hang Up Call #CHUP

Execute command ends all active and held calls, including if a multi-party session is running. Also, use to disconnect a data call from a CMUX instance different from the one that was used to start the data call.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CHUP	Execute
AT#CHUP=?	Test

Set Encryption Algorithm #ENCALG

This command enables or disables the GSM and/or GPRS encryption algorithms supported by the module.

Read command reports the currently selected <encGSM> and <encGPRS>, and the last used <useGSM> and <useGPRS> in the format:

#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>

where:

<usedGSM>

0	No GSM encryption algorithm.
1	A5/1.
2	A5/2.
4	A5/3.

<usedGPRS>

0	No GPRS encryption algorithm.
1	GEA1.
2	GEA2.
4	GEA3.

Test command reports the supported range of values for parameters in the format:

< encGSM > and <encGPRS>.

Syntax

Command	Command type
AT#ENCALG=[<encGSM>][,<encGPRS>]	
AT#ENCALG?	Read
AT#ENCALG=?	Test

Parameters and Values

<encGSM>

0	No GSM encryption algorithm.
1-7	Sum of integers each representing a specific GSM encryption algorithm.
1	A5/1.
2	A5/2.
4	A5/3.
255	Reset default values.

<encGPRS>:

0	No GPRS encryption algorithm.
1-3	Sum of integers each representing a specific GPRS encryption algorithm.
1	GEA1.
2	GEA2.
255	Reset default values.

Notes

- The values are stored in non-volatile memory and available on following reboot.
- For possible <encGSM> encryptions, see test command response.

Examples

AT#ENCALG?

#ENCALG: 5,2,1,1

OK

```
AT#ENCALG=5,1
```

```
OK
```

Sets the GSM encryption algorithm A5/1 and A5/3, and the GPRS encryption algorithm GEA1. It is available at the next reboot.

```
AT#ENCALG?
```

```
#ENCALG: 5,2,1,1
```

The last two values indicate that the last used GSM encryption algorithm is A5/1 and the last used GPRS encryption algorithm is GEA1.

After reboot

```
AT#ENCALG?
```

```
#ENCALG: 5,1,1,1
```

Read Current Network Status #RFSTS

Execute command reads current network status, in the format:

```
#RFSTS:<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,<RR>,<NOM>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>
```

where:

<PLMN>	Country code and operator code(MCC, MNC)
<ARFCN>	GSM Assigned Radio Channel
<RSSI>	Received Signal Strength Indication
<LAC>	Localization Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power
<MM>	Mobility Management state
<RR>	Radio Resource state
<NOM>	Network Operator Mode
<CID>	Cell ID
<IMSI>	International Mobile Subscriber Identity
<NetNameAsc>	Operator name
<SD>	Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS
<ABND>	Active band
1	GSM 850
2	GSM 900
3	DCS 1800
4	PCS 1900

Test command tests for command existence.

Syntax

Command	Command type
AT#RFSTS	Execute
AT#RFSTS=?	Test

Set CMUX Mode #CMUXMODE

Set command specifies the CMUX mode.

Read command reports the currently selected <mode>, in the format:

#CMUXMODE: <mode>

Test command reports the supported range of values for <mode>.

#CMUXMODE: (0,1,4,5)

Syntax

Command	Command type
AT#CMUXMODE=<mode>	Set
AT#CMUXMODE?	Read
AT#CMUXMODE=?	Test

Parameters and Values

<mode>	Socket connection identifier.
0	Old break octect format (0x01) and ignore DTR feature is disabled. Default: 0.
1	New break octect format (0x03) and ignore DTR feature is disabled. Default: 0.
4	Old break octect format (0x01) and ignore DTR feature is enabled.
5	New break octect format (0x03) and ignore DTR feature is enabled.

Notes

- The ignore DTR feature is enabled, the DCE doesn't care about the state and the transitions of the DTR line of the DTE. Otherwise, a transition of the DTR instructs the DCE to disable the CMUX and switches to the normal command mode.
- A software or hardware reset restores the default value.

Set AT Interface and Trace Interface #PORTCFG

AT#PORTCFG command allows to connect Service Access Points (software anchorage points) to the external physical ports giving a great flexibility. Examples of Service Access Points: AT Parser Instance #1,#2, #3, TT(Trace).

Refer to document S000552, Configuring Devices for a detailed explanation of port configurations

Read command reports: <requested> value shows the requested configuration that is activated on the next power off /on of the module; <active> value shows the actual configuration.

#PORTCFG: <requested>,<active>

Test command reports a brief description of the supported ports arrangement solutions. For each <Variant> parameter value are displayed, on one row, the allowed couples formed by: a physical port and the logically

connected internal software Access Point (AT, TT). On each row are reported the couples concerning both configurations: USB cable plugged into USB port or not plugged in.

AT, indicated on each command row result, can be AT0, AT1, or AT2.

Syntax

Command	Command type
AT#PORTCFG=<variant>	Set
AT#PORTCFG?	Read
AT#PORTCFG=?	Test

Parameters and Values

<variant>

0-6

Default: 0.

Notes

- To enable the set port configuration, reboot the device.

AT Run Commands

Enable SMS Run AT Service #SMSATRUN

Warning: Do not enable SMS AT Run with the default setting for AT#SMSATRUNCFG. Refer to Remotely Issuing AT Commands for more information.

Set command enables or disables the SMS AT RUN service.

Read command returns the current settings of <mode> and the value of <stat> in the format:

#SMSATRUN: <mod>,<stat>

where:

<stat>	Service status.
0	Not active.
1	Active.

Test command returns the supported values for the SMS AT RUN parameters.

Syntax

Command	Command type
AT#SMSATRUN=<mod>	Set
AT#SMSATRUN?	Read
AT#SMSATRUN=?	Test

Parameters and Values

<mod>

0

Service disabled. **Default: 0.**

1

Service enabled.

Notes

- When the service is active on a specific AT instance, that instance cannot be used for any other scope, except for OTA service that has the highest priority. For more information, see AT#SMSATRUNCFG. For example in the multiplexer request to establish the instance, the request is rejected.
- The current settings are stored in non-volatile memory.

Set SMS Run AT Service Parameters #SMSATRUNCFG

Set command configures the SMS AT RUN service.

Read command returns the current settings of parameters in the format:

```
#SMSATRUNCFG:<instance>,<urcmo>,<timeo>
```

Test command returns the supported values for the parameters.

Syntax

Command	Command type
AT#SMSATRUNCFG=<instance>[,<urcmo>[,<timeo>]]	Set
AT#SMSATRUNCFG?	Read
AT#SMSATRUNCFG=?	Test

Parameters and Values

<instance>	AT instance used by the service to run the AT command. Range 2 – 3. Default: 3.
<urcmo>	
0	Disable unsolicited message.
1	Enable an unsolicited message when an AT command is requested via SMS. Default: 1. When unsolicited is enabled, the AT command requested via SMS is indicated to TE with unsolicited result code: #SMSATRUN: <Text> For example: #SMSATRUN: AT+CGMR;+CGSN;+GSN;+CCLK
<timeo>	Unsolicited is dumped on the instance that requested the service activation. Defines in minutes the maximum time for a command execution. If timeout expires the module is rebooted.
1-60	Default: 5.

Notes

- The current settings are stored in non-volatile memory.
- The instance used for the SMS AT RUN service is the same used for the EvMoni service. Therefore, when the #SMSATRUNCFG sets the <instance> parameter, the change is reflected also in the <instance> parameter of the #ENAEVMONICFG command, and vice versa.
- The set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUN? returns 1 as <mod> parameter.

SMS AT Run White List #SMSATWL

Set command to handle the white list.

Read command returns the list elements in the format:

#SMSATWL: [<entryType>,<string>]

Test command returns the supported values for the parameter <action>, <index> and <entryType>

Syntax

Command	Command type
AT#SMSATWL=<action>,<index>[,<entryType>[,<string>]]	Set
AT#SMSATWL?	Read
AT#SMSATWL=?	Test

Parameters and Values

<action>

- 0** Add an entry to the white list.
- 1** Delete an entry from the white list.
- 2** Display an entry of the white list.

<index>

Index of the white list. Range 1-8.

<entryType >

Note: A maximum of two passwords can be specified in the white list.

- 0** Phone number.
- 1** Password.

<string>

String parameter enclosed between double quotes containing the phone number or the password.

Phone number contains numerical characters and the character “+” at the beginning of the string and the character “*” at the end of the string.

Password must be exactly 16 characters length.

Note: When the character “*” is used, it means that all the numbers that begin with the defined digit are part of the white list.

For example:

“+39*” All Italian users can ask to run AT command via SMS.

“+39349*” All Vodafone users can ask to run AT command via SMS.

Set TCP Run AT Service Parameter #TCPATRUNCFG

Warning: If your application or device does not have access to the second AT command instance, do not enable TCP Run AT over the AT command instance you are using.

Set command configures the TCP AT RUN service.

Read command returns the current settings of parameters in the format:

#TCPATRUNCFG: <connId>,<instance>,<tcpPort>,<tcpHostPort>,<tcpHost>,<urcmo>,<timeout>,<authMode>,<retryCnt>,<retryDelay>

Test command returns the supported values for the parameters

Syntax

Command	Command type
AT#TCPATRUNCFG=<connId>,<instance>,<tcpPort>,<tcpHostPort>,<tcpHost>[,<urcmod>[,<timeout>[,<authMode>[,<retryCnt>[,<retryDelay>]]]]]	Set
AT#TCPATRUNCFG?	Read
AT#TCPATRUNCFG=?	Test

Parameters and Values

<connId>	Socket connection identifier. Default: 1. Range 1-6. This parameter is mandatory.
<instance>	AT instance used by the service to run the AT command. Range 2 - 3. Default: 2. This parameter is mandatory.
<tcpPort>	TCP listen port for the connection to the service in server mode. Default: 1024. Range 1-65535. This parameter is mandatory.
<tcpHostPort>	TCP remote port of the host to connect to, in client mode. Default: 1024. Range 1-65535. This parameter is mandatory.
<tcpHost>	String type, IP address of the host. This parameter can be either: Any valid IP address in the format: "xxx.xxx.xxx.xxx". Any host name to be solved with a DNS query. This parameter is mandatory. Default: "" . Note: If username or password are not allowed—see AT#TCPATRUNAATH—the connection closes immediately.
<urcmod>	
0	Disable unsolicited messages.
1	Enable an unsolicited message when the TCP socket is connected or disconnect. Default: 1. When unsolicited is enabled, an asynchronous TCP Socket connection is indicated to TE with unsolicited result code: #TCPATRUN: <iphostaddress> When unsolicited is enabled, the TCP socket disconnection is indicated to TE with unsolicited result code: #TCPATRUN: <DISCONNECT> Unsolicited is dumped on the instance that requested the service activation.
<timeout>	Define in minutes the maximum time for a command execution. If timeout expires the module is rebooted. Default: 5 minutes. Range: 1-5.
<authMode>	Determines the authentication procedure in server mode.
0	When connection is up, username and password (in this order, each followed by a carriage return) must be sent to the module before the first AT command. Default: 0.
1	When connection is up, the user receives a request for username and, if username is correct, a request for password. Then a message of "Login successful" closes authentication phase. If username and/or password are not allowed (see AT#TCPATRUNAATH) the connection will close immediately.

- <retryCnt>** In client mode, at boot or after a socket disconnection, this parameter represents the number of attempts that are made in order to re-connect to the host.
Default: 0. Range: 0-5.
- <retryDelay>** In client mode, delay between one attempt and the other. In minutes.
Default: 2. Range: 1-3600.

Notes

- The current settings are stored in non-volatile memory.
- To start the service automatically when the module is powered-on, you must set the automatic PDP context activation. See AT#SGACTCFG command.
- The set command returns ERROR if the command AT#TCPATRNL? returns 1 as <mod> parameter or the command AT#TCPATRUND? returns 1 as <mod> parameter.

TCP Run AT Service in Listen Server Mode #TCPATRNL

Set command enables or disables the TCP AT RUN service in server mode. When this service is enabled, the module tries to put itself in TCP listen state.

Read command returns the current settings of <mode> and the value of <stat> in the format:

#TCPATRNL: <mod>,<stat>

where:

- | | |
|---------------------|-----------------------|
| <stat> | Connection status. |
| 0 | Not in listen. |
| 1 | In listen, or active. |

Test command returns the supported values for the parameters

Syntax

Command	Command type
AT#TCPATRNL=<mod>	Set
AT#TCPATRNL?	Read
AT#TCPATRNL=?	Test

Parameters and Values

- | | |
|--------------------|-------------------|
| <mod> | |
| 0 | Service disabled. |
| 1 | Service enabled. |

Notes

- If SMSATRUN is active on the same instance—see AT#TCPATRUNCFG—the command returns ERROR.
- When the service is active it is on a specific AT instance—see AT#TCPATRUNCFG—that instance cannot be used for any other scope. For example, if the multiplexer requests to establish the instance, the request is rejected.
- The current settings are stored in non-volatile memory.
- To start the service automatically when the module is powered on, the automatic PDP context activation must be set. See AT#SGACTCFG.

TCP AT Run Firewall List #TCPATRUNFRWL

Set command controls the internal firewall settings for the TCP AT RUN connection.

Read command reports the list of all ACCEPT chain rules registered in the firewall settings in the format:

```
#TCPATRUNFRWL: <ip_addr>,<net_mask>
```

```
#TCPATRUNFRWL: <ip_addr>,<net_mask>
```

```
...
```

```
OK
```

Test command returns the allowed values for <action>.

Syntax

Command	Command type
AT#TCPATRUNFRWL=<action>,<ip_addr>,<net_mask>	Set
AT# TCPATRUNFRWL?	Read
AT#TCPATRUNFRWL=?	Test

Parameters and Values

<action>	Command action.
0	Remove selected chain.
1	Add an ACCEPT chain.
2	Remove all chains (DROP everything); <ip_addr> and <net_mask> has no meaning in this case.
<ip_addr>	String type, remote address added into the ACCEPT chain. Can be any valid IP address in the format: xxx.xxx.xxx.xxx.
<net_mask>	String type, mask to be applied on the <ip_addr>. It can be any valid IP address mask in the format: xxx.xxx.xxx.xxx. Command returns OK result code if successful.

Firewall general policy is DROP. Therefore all packets that are not included into an ACCEPT chain rule are silently discarded.

When a packet comes from the IP address `incoming_IP`, the firewall chain rules are scanned for matching with the following criteria:

`incoming_IP & <net_mask> = <ip_addr> & <net_mask>`

If criteria is matched, then the packet is accepted and the rule scan is finished. If criteria is not matched for any chain the packet is silently dropped.

Notes

- A maximum of 5 firewalls can be present at same time in the list.
- The firewall list is saved in non-volatile memory.

TCP AT Run Authentication Parameters List #TCPATRUNAUTH

Execute command controls the authentication parameters for the TCP AT RUN connection.

Read command reports the list of all ACCEPT chain rules registered in the Authentication settings in the format:

```
#TCPATRUNAETH: <user_id>,<passw>
```

```
#TCPATRUNAETH: <user_id>,<passw>
```

```
....
```

```
OK
```

Test command returns the allowed values for parameter <action>.

Syntax

Command	Command type
AT#TCPATRUNAETH=<action>,<userid>,<passw>	Execute
AT#TCPATRUNAETH?	Read
AT#TCPATRUNAETH=?	Test

Parameters and Values

<action>	Command action.
0	Remove selected chain.
1	Add an ACCEPT chain.
2	Remove all chains (DROP everything). <userid> and <passw> has no meaning in this case.
<userid>	String type, user to be added into the ACCEPT chain. Maximum length 50.
<passw>	String type, password of the user on the <userid>. Maximum length 50. Command returns OK result code if successful.

Notes

- A maximum of 3 entries (password and userid) can be present at same time in the list.
- The Authentication Parameters List is saved in non-volatile memory.

TCP AT Run in Dial (Client) Mode #TCPATRUND

Set command enables or disables the TCP AT RUN service in client mode. When this service is enabled, the module tries to open a connection to the host. The host is specified in AT#TCPATRUNCFG.

Read command returns the current settings of <mode> and the value of <stat> in the format:

#TCPATRUND: <mode>,<stat>

where:

<stat>

- | | |
|---|---|
| 0 | Not connected. |
| 1 | Connected or connecting at socket level. |
| 2 | Not connected but still trying to connect, attempting every delay time. Delay time is specified using AT#TCPATRUNCFG. |

Test command returns the supported values for the TCPATRUND parameters.

Syntax

Command	Command type
AT#TCPATRUND=<mod>	Set
AT#TCPATRUND?	Read
AT#TCPATRUND=?	Test

Parameters and Values

<mod>

- | | |
|---|-------------------|
| 0 | Service disabled. |
| 1 | Service enabled. |

Notes

- If SMSATRUN is active on the same instance (see AT#TCPATRUNCFG) the command returns ERROR.
- When the service is active it is on a specific AT instance (see AT#TCPATRUNCFG), that instance cannot be used for any other scope. For example if the multiplexer request to establish the instance, the request is rejected.
- The current setting are stored in non-volatile memory.
- To start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see AT#SGACTCFG command).
- If the connection closes or when the module reboots, if service is enabled and context is active, the module tries to reconnect for the number of attempts specified in AT#TCPATRUNCFG. The delay between one attempt and the other is specified in AT#TCPATRUNCFG

Closing TCP Run AT Socket #TCPATRUNCLOSE

Set command closes the socket used by TCP AT RUN service.

Note: TCP AT RUN status is still enabled after this command, so the service re-starts automatically.

Test command returns OK.

Syntax

Command	Command type
AT#TCPATRUNCLOSE	Set
AT#TCPATRUNCLOSE=?	Test

TCP Run AT Command Sequence #TCPATCMDSEQ

Warning: If your application or device does not have access to the second AT command instance, do not enable TCP Run AT over the AT command instance you are using.

Set command enable/disable, for TCP Run AT service, a feature that allows giving more than one AT command without waiting for responses.

It does not work with commands that use the prompt '>' to receive the message body text (for example "at+cmgs")

Read command returns the current settings of parameters in the format:

```
#TCPATCMDSEQ: <mod>
```

Test command returns the supported values for the TCPATCMDSEQ parameters.

Syntax

Command	Command type
AT#TCPATCMDSEQ=<mod>	Set
AT# TCPATCMDSEQ?	Read
AT#TCPATCMDSEQ=?	Test

Parameters and Values

<mod>

- 0** Service disabled. **Default: 0.**
- 1** Service enabled.

TCP Run AT Service to a Serial Port #TCPATCONSER

Set command sets the TCP Run AT in transparent mode, to have direct access to the serial port specified. Data is transferred directly, without being elaborated, between the TCP Run AT service and the serial port specified.

If the CMUX protocol is running the command returns ERROR.

Test command returns the supported values for the TCPATCONSER parameters.

Syntax

Command	Command type
AT#TCPATCONSER=<port>,<rate>	Set
AT#TCPATCONSER=?	Test

Parameters and Values

<port>

- 0-1** Serial port to connect to.

<rate>	Baud rate for data transfer. Allowed values appear under <rate>.
300	
1200	
2400	
4800	
9600	
19200	
38400	
57600	
115200	

Notes

- You must issue the set command from the TCP AT RUN instance.
- After you issue the set command, if no error has occurred, then the module issues a “CONNECT” to advise that the TCP AT RUN instance is in online mode and connected to the specified port.
- To exit from online mode and close the connection, the escape sequence (+++) must be sent on the TCP AT RUN instance.

Run AT Command Execution #ATRUNDELAY

Set command enables the use of a delay before the execution of AT command received by Run AT service (TCP and SMS). It affects only AT commands given through Run AT service.

Read command returns the current settings of parameters in the format:

#ATRUNDELAY: 0, <delayTCP>

#ATRUNDELAY: 1, <delaySMS>

OK

Test command returns the supported values for the ATRUNDELAY parameters.

Syntax

Command	Command type
AT#ATRUNDELAY=<srv>,<delay>	Set
AT#ATRUNDELAY?	Read
AT#ATRUNDELAY=?	Test

Parameters and Values

<srv>	
0	TCP Run AT service.
1	SMS Run AT service.
<delay>	Value of the delay, in seconds. Range 0-30. Default: 0 for both services (TCP and SMS).

Notes

- The use of the delay is recommended to execute some AT commands that require network interaction or switch between GSM and GPRS services.
- The delay is valid until a new AT#ATRUNDELAY is set.

Event Monitor Commands

Enable EvMoni Service #ENAEVMONI

Set command enables or disables the EvMoni service.

Read command returns the current settings of <mode> and the value of <stat> in the format:

ENAEVMONI: <mod>,<stat>

where:

<stat>	Service status.
0	Active.
1	Connected or connecting at socket level

Test command returns the supported values for the ENAEVMONI parameters.

Syntax

Command	Command type
AT#ENAEVMONI=<mod>	Set
AT#ENAEVMONI?	Read
AT#ENAEVMONI=?	Test

Parameters and Values

<mod>	
0	Service disabled. Default: 0.
1	Service enabled.

Note: When the service is active on a specific AT instance, that instance cannot be used for any other scope, except for OTA service that has the highest priority. For example in the multiplexer request to establish the instance, the request is rejected.

Notes

- The current settings are stored in non-volatile memory.

EvMoni Service Parameter #ENAEVMONICFG

Set command configures the EvMoni service.

Read command returns the current settings of parameters in the format:

#ENAEVMONICFG:<instance>,<urcmod>,<timeout>

Test command returns the supported values for the ENAEVMONICFG parameters.

Syntax

Command	Command type
AT#ENAEVMONICFG=<instance>[,<urcmode>[,<timeout>]]	Set
AT#ENAEVMONICFG?	Read
AT#ENAEVMONICFG=?	Test

Parameters and Values

<instance>	AT instance used by the service to run the AT command. Range 2 - 3. Default: 3.
<urcmode>	
0	Disable unsolicited message.
1	Enable an unsolicited message when an AT command is executed after an event is occurred. Default: 1. When unsolicited is enabled, the AT command is indicated to TE with unsolicited result code: #EVMONI: <Text> For example: #EVMONI: AT+CGMR;+CGSN;+GSN;+CCLK Unsolicited is dumped on the instance that requested the service activation.
<timeout>	Defines in minutes the maximum time for a command execution. If timeout expires the module is rebooted. Default: 5.

Notes

- The current settings are stored in non-volatile memory.
- The instance used for the EvMoni service is the same used for the SMS AT RUN service. Therefore, when the #ENAEVMONICFG sets the <instance> parameter, the change is reflected also in the <instance> parameter of the #SMSATRUNCFG command, and vice versa.
- The set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUNCFG? returns 1 as <mod> parameter

Event Monitoring #EVMONI

Set command enables or disables the single event monitoring, configures the related parameter and associates the AT command.

Read command returns the current settings for each event in the format:

```
#EVMONI: <label>,<mode>,<param0>[,<param1>[,<param2>[,<param3>]]]
```

where <param0>, <param1>, <param2> and <param3> are defined as before for <param> depending on <label> value.

Test command returns values supported as a compound value.

Syntax

Command	Command type
AT#EVMONI =<label>,<mode>[,<paramType>,<param>]	Set
AT#EVMONI?	Read
AT#EVMONI=?	Test

Parameters and Values

<label>	String parameter—enclosed between double quotes—indicating the event under monitoring. It can assume the following values:
VBATT	Battery voltage monitoring. Not yet implemented.
DTR	DTR monitoring. Not yet implemented.
ROAM	Roaming monitoring.
CONTDEACT	Context deactivation monitoring.
RING	Call ringing monitoring.
STARTUP	Module start-up monitoring.
REGISTERED	Network registration monitoring.
GPIO1	Not supported.
GPIO2	Not supported.
GPIO3	Not supported.
GPIO4	Not supported.
GPIO5	Not supported.
ADCH1	ADC high voltage monitoring.
ADCL1	ADC low voltage monitoring.
DTMF1	Monitoring on user defined DTMF string.
DTMF2	Monitoring on user defined DTMF string.
DTMF3	Monitoring on user defined DTMF string.
DTMF4	Monitoring on user defined DTMF string.
CONSUME1	Used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command).
CONSUME2	
CONSUME3	
CONSUME4	
CONSUME5	
<mode>	
0	Disable the single event monitoring. Default: 0.
1	Enable the single event monitoring.
<paramType>	Numeric parameter indicating the type of parameter contained in <param>. 0 value indicates that <param> contains the AT command string to execute when the related event has occurred. Other values depend from the type of event.
<param>	Numeric or string value depending on the value of <paramType> and on the type of event.

- If <paramType> is 0, then <param> is a string containing the AT command:
 - It has to be enclosed between double quotes
 - It has to start with the 2 characters AT (or at).
 - If the string contains the character ", then it has to be replaced with the 3 characters \22.
 - The maximum string length is 96 characters.
 - If it is an empty string, the AT command is erased.

- If <label> is VBATT, <paramType> can assume values in the range 0 - 2.
 - if <paramType> = 1, <param> indicates the battery voltage threshold in the range 0 – 500, where one unit corresponds to 10 mV (therefore 500 corresponds to 5 V). Default: 0.
 - if <paramType> = 2, <param> indicates the time interval in seconds after that the voltage battery under the value specified with <paramType> = 1 causes the event. The range is 0 – 255. Default: 0.
- If <label> is DTR, <paramType> can assume values in the range 0 - 2.
 - if <paramType> = 1, <param> indicates the status high or low under monitoring. The values are 0 (low) and 1 (high). Default: 0.
 - if <paramType> = 2, <param> indicates the time interval in seconds after that the DTR in the status specified with <paramType> = 1 causes the event. The range is 0 – 255. Default: 0
- If <label> is ROAM, <paramType> can assume only the value 0. The event under monitoring is the roaming state.
- If <label> is CONTDEACT, <paramType> can assume only the value 0. The event under monitoring is the context deactivation.
- If <label> is RING, <paramType> can assume values in the range 0 - 1.
 - If <paramType> = 1, <param> indicates the numbers of call rings after that the event occurs. The range is 1-50. Default: 1.
- If <label> is STARTUP, <paramType> can assume only the value 0. The event under monitoring is the module start-up.
- If <label> is REGISTERED, <paramType> can assume only the value 0. The event under monitoring is the network registration (to home network or in roaming) after the start-up and the SMS ordering.
- If <label> is ADCH1, <paramType> can assume values in the range 0 - 3.
 - if <paramType> = 1, <param> indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. Default: 1.
 - if <paramType> = 2, <param> indicates the ADC High voltage threshold in the range 0 – 2000 mV. Default: 0.
 - if <paramType> = 3, <param> indicates the time interval in seconds after that the selected ADC pin above the value specified with <paramType> = 1 causes the event. The range is 0 – 255. **Default: 0.**
- If <label> is ADCL1, <paramType> can assume values in the range 0 - 3.
 - If <paramType> = 1, <param> indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. Default: 1.
 - If <paramType> = 2, <param> indicates the ADC Low voltage threshold in the range 0 – 2000 mV. Default: 0.
 - If <paramType> = 3, <param> indicates the time interval in seconds after that the selected ADC pin under the value specified with <paramType> = 1 causes the event. The range is 0 – 255. Default: 0.
- If <label> is DTMFX, <paramType> can assume values in the range 0 - 2.
 - If <paramType> = 1, <param> indicates the DTMF string; the single DTMF characters have to belong to the range ((0-9),#,*,(A-D)); the maximum number of characters in the string is 15
 - If <paramType> = 2, <param> indicates the timeout in milliseconds. It is the maximum time within which a DTMF tone must be detected after the previous tone was detected to be considered as belonging to the DTMF string. The range is (500 – 5000). Default: 1000.

Notes

- DTMF string monitoring is available only if the DTMF decode is enabled. See #DTMF command.

Send Message #CMGS

For both Text mode and PDU mode, Execute command sends a message to the network.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CMGS=<length>,<pdu>	Execute. PDU mode.
AT#CMGS=<da>,"<text>"	Execute. Text mode.
AT#CMGS=?	Test

Parameters and Values for PDU Mode

<length> 7-164	Length of the PDU to be sent in bytes, excluding the SMSC address octets.
<pdu>	<p>PDU in hexadecimal format—each octet of the PDU is given as two IRA character long hexadecimal number—and given in one line.</p> <p>Note: When the length octet of the SMSC address (given in the <pdu>) equals zero, the SMSC address set with command +CSCA is used; in this case the SMSC Type-of-Address octet is not present in the <pdu>.</p> <p>If message is successfully sent to the network, then the result is sent in the format:</p> <p>#CMGS: <mr></p> <p>where</p> <p><mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.</p>

Note: If message sending fails for some reason, an error code is reported.

Parameters and Values for Text Mode

<da>	String type, destination address represented in the currently selected character set. See +CSCS.
<text>	<p>Text to send.</p> <p>Enclose entered text between double quotes. Format text as follows:</p> <ul style="list-style-type: none"> ■ If current <dc> indicates that GSM03.38 default alphabet is used and current <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. For more information about <dc> and <fo>, see +CSMP. ■ If current <dc> indicates that 8-bit or UCS2 data coding scheme is used or current <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set. For more information about <dc> and <fo>, see +CSMP. <p>Entered text consists of two IRA character long hexadecimal numbers that ME/TA converts into 8-bit octet. For example the 'asterisk' is entered as 2A (IRA50 and IRA65) and this is converted to an octet with integer value 0x2A.</p>

If message is successfully sent to the network, then the result is sent in the format:

#CMGS: <mr>

where

<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.

Note: If message sending fails, an error code is reported.

Notes

- To avoid malfunctions, wait for the #CMGS: <mr> or #CMS ERROR: <err> response before issuing further commands.
- Reference: GSM 27.005.

Examples

SMS text mode example

```
AT+CMGF=1
```

```
AT#CMGS=6125553333,"this is my message"
```

```
<CR LF>
```

```
#CMGS: 2
```

```
OK
```

SMS PDU mode example

```
AT+CMGF=0
```

```
AT#CMGS=30,07913121139418F011000A9155454433330000AA13C27A1EC47EDF59A06999CD0621D3677408
```

```
<CR LF>
```

```
#CMGS: 3
```

```
OK
```

Write Message to Memory #CMGW

For both PDU mode and text mode, Execute command writes a new message in the <memw> memory storage.

Test command returns the OK result code.

Syntax

Command	Command type
AT#CMGW=<length>,<pdu>	Execute, PDU mode
AT#CMGW=<da>,"<text>"	Execute, Text mode
AT#CMGW=?	Test

Parameters and Values for PDU Mode

<length>	Length in bytes of the PDU to be written.
7-164	
<pdu>	<p>PDU in hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line.</p> <p>If message is successfully written in the memory, then the result is sent in the format:</p> <p>#CMGW: <index></p> <p>where:</p> <p><index> - message location index in the memory <memw>.</p> <p>If message storing fails for some reason, an error code is reported.</p>

Parameters and Values for Text Mode

<da>	String type, destination address represented in the currently selected character set. See +CSCS.
7-164	
<text>	<p>Text to write. Enclose entered text between double quotes. Format text as follows:</p> <ul style="list-style-type: none"> ■ If current <dc> indicates that GSM03.38 default alphabet is used and current <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. For more information about <dc> and <fo>, see +CSMP. ■ If current <dc> indicates that 8-bit or UCS2 data coding scheme is used or current <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set. For more information about <dc> and <fo>, see +CSMP. <p>Entered text consists of two IRA character long hexadecimal numbers that ME/TA converts into 8-bit octet. For example the 'asterisk' is entered as 2A (IRA50 and IRA65) and this is converted to an octet with integer value 0x2A.</p> <p>If message is successfully written in memory, the result is sent in the format:</p> <p>#CMGW: <index></p> <p>where:</p> <p><index> - message location index in the memory <memw>.</p> <p>If message storing fails for some reason, an error code is reported.</p>

Notes

- To avoid malfunctions, wait for the #CMGW: <index> or +CMS ERROR: <err> response before issuing further commands.
- Reference: GSM 27.005

Examples

Example text mode

```
AT#CMGW=6124241372,"My Message here"
```

```
<CR><LF>
```

```
#CMGW: 5
```

```
OK
```

Refer to send message

AT+CMSS=X where X is value given through #CMGW: X response to message write.

SMS text mode example

```
AT+CMGF=1
```

```
AT#CMGW=6125553333,"this is my message"
```

```
<CR LF>
```

```
#CMGW: 2
```

```
OK
```

SMS PDU mode example

```
AT+CMGF=0
```

```
AT#CMGW=30,07913121139418F011000A9155454433330000AA13C27A1EC47EDF59A06999CD0621D3677408
```

```
<CR LF>
```

```
#CMGW: 3
```

```
OK
```

CONSUME Commands

Configure Consume Parameters #CONSUMECFG

Set command sets the parameters related to the consume function.

Read command returns the current settings in the format:

```
#CONSUMECFG: <rule_id>,<service_type>,<rule_enable>,<period>,<limit_amount>,<action_id>
```

Test command returns support range of values for all parameters.

Syntax

Command	Command type
AT#CONSUMECFG=<rule_id>[,<service_type>[,<rule_enable>[,<period>[,<limit_amount>[,<action_id>]]]]]	Set
AT#CONSUMECFG?	Read
AT#CONSUMECFG=?	Test

Parameters and Values

<rule_id>	Index of the rule to apply to a defined <service_type> Range: (0-10) The available rules are 10 and their identifier ranges from 1 to 10. The special case of <rule_id>=0 is explained below in a note.
<service_type>	Type of service to count.
0	No service. Default: 0.
1	SMS sent.
2	SMS received.
3	Total SMS.
4	CS MO calls.
5	CS MT calls.
6	Total CS calls.
7	IP all data sent.
8	IP all data received.
9	IP all data.
10	IP all data sent with header.
11	IP all data received with header.
12	IP all data with header.
<rule_enable>	Enable the counter on the rule.
0	Rule disable. Default: 0.
1	Rule enabled.
<period>	Time over which the service type data are counted.
0	Life (entire module life). Default: 0.
1	8760 (hours).
<limit_amount>	Limit amount of data to count. 0 is default value and means no set limit: in this case, only the counter is active. 0 – 4294967295 KBytes, for <service_type>=7,8,9,10,11 and 12 0 – 65535 number of SMS, for <service_type>=1,2, and 3 0 – 65535 minutes, for <service_type>=4,5 and 6
<action_id>	Identifies the action to trigger when the threshold limit has been reached. Corresponds to the AT command associated to the event CONSUMEX, where X=1,...5. (Refer to #EVMONI command) Range: (0-5). 0 means no action associated: in this case, only the counter is active.

Notes

- Set command #CONSUMECFG=0 has a special behavior for all enabled rules, the data and time of related counters are reset, if they are not life counters.
- The life counters are disabled if <enable> parameter of AT#ENACONSUME is equal to 0
- A rule can be changed only setting <rule_enable>=0. The data and time of related counter are also reset, if they are not life counters.

- When the period expires and the data limit has not been reached, then the counted data are reset, so the counting in the next period starts from 0.
- If a service is blocked, then the related (life or not) counter is stopped in terms of time and data.
- This setting is saved in non-volatile memory and doesn't depend on the specific CMUX instance.

Enable Consume Functions #ENACONSUME

Set command enables or disables consume functions.

Read command returns the current settings in the format:

#ENACONSUME: <enable>,<storing_mode>,<storing_period>

Test command returns support range of values for all parameters.

Syntax

Command	Command type
AT#ENACONSUME=<enable>[,<storing_mode>[,<storing_period>]]	Set
AT#ENACONSUME?	Read
AT#ENACONSUME=?	Test

Parameters and Values

<enable>

- 0** Disable consume functions. **Default: 0.**
- 1** Disable consume functions except life counters.
- 2** Enable consume functions.

<storing_mode>

- 0** Counters are saved in non-volatile memory at every shutdown. **Default: 0.**
- 1** Counters are saved in non-volatile memory at every shutdown and periodically at regular intervals specified by <storing_period>.

<storing_period> Number of hours after that the counters are saved; numeric value in hours; range (0,8-24); 0 is default value and means no set period (as <storing_mode>=0).

Notes

- Values set by command are directly stored in non-volatile memory and don't depend on the specific CMUX instance.
- When the consume functions are disabled with <enable>=0, the data counters are stopped, but not reset. To reset them (except life counters) set <rule_enable>=0 with AT#CONSUMECFG command.
- When the consume functions are disabled with <enable>=1, the data counters are stopped except life counters.
- The counted data and time for life counters are never reset.

Report Consume Statistics #STATSCONSUME

Execute command sets the parameters related to the consume function.

Read command returns the current settings in the format:

#CONSUMECFG: <rule_id>,<service_type>,<rule_enable>,<period>,<limit_amount>,<action_id>

Test command returns support range of values for all parameters.

Syntax

Command	Command type
AT#STATSCONSUME[=<counter_type>]	Set
AT#STATSCONSUME	Read
AT#STATSCONSUME=?	Test

Parameters and Values

<counter_type>

0

Type of counter: range (0-1).

Period counter. The command returns the values of period counters for every rule defined with AT#CONSUMECFG in the format:

#STATSCONSUME:

<rule_1>,<service_type>,<counted_data>,<threshold>,<current_time>,<period><CR><LF>#STATSCONSUME:

<rule_2>,<service_type>,<counted_data>,<threshold>,<current_time>,<period><CR><LF>....<CR><LF>#STATSCONSUME:

<rule_10>,<service_type>,<counted_data>,<threshold>,<current_time>,<period>

where

<rule_i> – Index of the rule defined with AT#CONSUMECFG

<service_type> – Type of service:

- 1 – SMS Sent
- 2 – SMS Received
- 3 – Total SMS
- 4 – CS MO Calls
- 5 – CS MT Calls
- 6 – Total CS Calls
- 7 – IP All Data Sent
- 8 – IP All Data Received
- 9 – IP All Data
- 10 – IP All Data Sent (with Header)
- 11 – IP All Data Received (with Header)
- 12 – IP All Data (with Header)

<counted_data> – Number of data counted during <current_time>

<threshold> – Limit amount of data to count (set in parameter <limit_amount> with AT#CONSUMECFG)

<current_time> – Number of passed hours in the current <period>

<period> – Number of total hours in the period where the data are counted (corresponds to the value set in <period> with AT#CONSUMECFG)

1

Life counter. Command returns life counters value for every service type in the format:

```
#STATSCONSUME: <service_1>,<life_data>,<current_time><CR><LF>#STATSCONSUME:
<service_2>,<life_data>,<current_time><CR><LF>...<CR><LF>#STATSCONSUME:
<service_12>,<life_data>,<current_time>
```

where

<service_i> - as defined above.

<life_data> – Number of data counted during entire life time period

<current_time> – Number of passed hours during entire life time period

Notes

- Issuing AT#STATSCONSUME with parameters has the same effect as AT#STATSCONSUME=0.

Block or Unblock a Service Type #BLOCKCONSUME

Execute command block or unblocks a service type.

Read command reports the status blocked/unblocked of every type of service in the format:

```
#BLOCKCONSUME: <service_type>,<block>
```

Test command returns support range of values for all parameters.

Syntax

Command	Command type
AT#BLOCKCONSUME=<service_type>,<block>]	Execute
AT#BLOCKCONSUME?	Read
AT#BLOCKCONSUME=?]	Test

Parameters and Values

<service_type> Type of service to count.

- | | |
|---|----------------------------|
| 1 | SMS sending. |
| 2 | SMS receiving. |
| 3 | SMS sending and receiving. |
| 4 | CS MO calls. |
| 5 | CS MT calls. |
| 6 | MO/MT CS calls. |
| 7 | IP data. |

<block>

- | | |
|---|--|
| 1 | Unblock the service specified in <service_type>. |
| 2 | Block the service specified in <service_type>. |

Notes

- Even if the “SMS Received” has been blocked, an SMS ATRUN digest SMS can be received and managed.
- Type of service 7 IP Data comprises all the IP services (i.e. IP ,with or without header, sent, receive and sent/receive data).

FOTA Commands

OTA Set Network Access Point #OTASNAP

Set command specifies the SMS number that the module uses to send Remote Registration SM. If the current IMSI hasn't been registered, the Remote Registration SM is sent automatically.

Read command returns the current settings in the format:

```
#OTASNAP: <addr>[,<company_name>]
```

Test command returns the maximum length of <addr> and <company_name> fields in the format:

```
#OTASNAP: <nlength>,<tlength>
```

where:

<nlength>	Integer type value indicates the maximum length of <addr>
<tlength>	Integer type value indicates the maximum length of <company_name>

Syntax

Command	Command type
AT#OTASNAP=<addr>[,<company_name>]	Set
AT#OTASNAP?	Read
AT#OTASNAP=?	Test

Parameters and Values

<addr>	String parameter that specifies the phone number.
<company_name>	String parameter containing a client identifier.

Notes

- To delete the SMS number, use the following Set command variation:
#OTASNAP=""
- Overwrite the <addr> value from the OTA server by the provisioning SMS.
- Changing the <company_name> value creates a new FOTA Registration procedure.
- If the <company_name> is an empty string, an ERROR is returned.
- This setting is saved in non-volatile memory.

Examples

```
AT#OTASNAP="SMS Number","Client Alpha"
```

```
OK
```

```
AT#OTASNAP?
```

```
#OTASNAP:"SMS Number","Client Alpha"
```

```
OK
```

```
AT#OTASNAP=?
```

```
#OTASNAP: 21,15
```

```
OK
```


OTA Set User Answer #OTASUAN

Set command enables or disables sending the #OTAEV unsolicited result code that asks the TE to accept or reject the management server request to download firmware. It allows the TE to accept or reject the request.

Read command returns the current settings in the format:

```
#OTASUAN : ,<mode>,<brf>
```

Test command returns the values supported as a compound value.

Syntax

Command	Command type
AT#OTASUAN=<response>[,<mode>[,<brf>]]	Set
AT#OTASUAN?	Read
AT#OTASUAN=?	Test

Parameters and Values

<response>	Numeric parameter used to accept or reject the download request.
0	Request is rejected.
1	Request is accepted.
2	Request is delayed indefinitely. The URC is prompted indefinitely until the request is accepted or rejected.
<mode>	Numeric parameter that controls unsolicited result code #OTAEV processing.
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 (for example, in online data mode); otherwise forward them directly to the TE.
2	Buffer unsolicited result codes in the MT when MT-TE link is reserved (for example, in online data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE.
<brf>	Numeric parameter that controls the effect on buffered codes when <mode>=1 or 2.
0	Clears MT buffer of unsolicited result codes #OTAEV when <mode>=1 or 2.
1	MT buffer of unsolicited result codes #OTAEV flushes to TW when <mode>=1 or 2.

The following unsolicited result codes and the corresponding events are defined:

#OTAEV: Do you want to upgrade the firmware?	A management server request to start the firmware upgrade. The user answer is expected.
#OTAEV: User Answer Timeout	Expected user answer not received within server defined time interval.
#OTAEV: Automatic Fw Upgrade Requested	An automatic Fw Upgrade procedure has started.
#OTAEV: Start Fw Download	The firmware download is started.
#OTAEV: Fw Download Complete	The firmware download is finished.

#OTAEV: OTA Fw Upgrade Failed
The Fw upgrade has failed.

#OTAEV: Module Upgraded To New Fw
The Fw upgrade is successfully finished.

#OTAEV: Server notified about successful FW Upgrade
The final SMS has been sent to the server notifying the successful FW upgrade.

#OTAEV: Registered
The module has registered itself to a server.

#OTAEV: Not registered
The registration procedure has failed.

#OTAEV: Company Name Registered
The company name is registered.

#OTAEV: Company Name not registered
The company name is not registered.

#OTAEV: Provisioned
A server has provisioned the module.

#OTAEV: Notified
A server has notified the module.

Examples

```
AT#OTASUAN= , 2 , 1
OK
AT#OTASUAN?
#OTASUAN:  , 2 , 1
OK
AT#OTASUAN =?
#OTASUAN: ( 0-2 ) , ( 0-2 ) , ( 0 , 1 )
OK
```

OTA Set Ring Indicator #OTASETRI

Set command enables or disables the ring indicator pin response to a manual OTA server request to start the firmware upgrade. If enabled, a negative going pulse generates when the unsolicited response code, *#OTAEV: Do you want to upgrade the firmware?* is prompted (see AT#OTASUAN command). The pulse duration is determined by the value of <n>.

Read command reports the duration in ms of the pulse generated when the unsolicited response code, *#OTAEV: Do you want to upgrade the firmware?* is prompted, in the format:

```
#OTASETRI: <n>
```

Test command reports the range of supported values for <n>.

Syntax

Command	Command type
AT#OTASETRI=<n>]	Set
AT#OTASETRI?	Read
AT#OTASETRI=?]	Test

Parameters and Values

<n>	Ring indicator enabling.
0	Disables ring indicator response when the unsolicited response code, #OTAEV: <i>Do you want to upgrade the firmware?</i> is prompted. Default: 0.
50-1150	Enables ring indicator pin response. This value is the duration in ms of the pulse generated when the unsolicited response code, #OTAEV: <i>Do you want to upgrade the firmware?</i> is prompted.

Notes

- If the <response> parameter of the AT#OTASUAN command has the value 2, then the unsolicited response code is prompted indefinitely until the Fw update request is accepted or rejected. A pulse is generated for every unsolicited response code.
- This setting is saved in the profile parameters.

Saves IP port and IP address for OTA over IP #OTAIPCFG

Set command saves the IP port number and IP address of the OTA server in the non-volatile memory.

Read command reports the currently selected <IPort> and <IPAddr> in the format:

```
#OTAIPCFG: <IPort>,<IPAddr>,0
```

Test command reports the range of supported values for <IPort> and <unused>.

Syntax

Command	Command type
AT#OTAIPCFG=<IPort>,<IP addr>[,<unused>]	Set
AT#OTAIPCFG?	Read
AT#OTAIPCFG=?]	Test

Parameters and Values

<IPort>	IP port of the OTA server.
<IPAddr>	IP address of the OTA server, string type. This parameter can be any valid IP address in the format xxx.xxx.xxx.xxx.

Notes

- The values set by the command are directly stored in non-volatile memory and don't depend on the specific CMUX instance.
- To set the IP address to 0.0.0.0, use the Set command:
#OTAIPCFG=<IPort>,""

Starts an OTA Update over IP #OTAIPUPD

Execute command starts an OTA update over IP. To complete the update, the device has to be registered in the OTA server.

Read command reports the current status of the OTA over IP in the following format:

#OTAIPUPD: <status>

If the OTA over IP is running, the value 1 is returned. In this case, the user receives unsolicited messages. Otherwise, the value is 0.

Test command test for command existence.

Syntax

Command	Command type
AT#OTAIPUPD	Execute
AT#OTAIPUPD?	Read
AT#OTAIPUPD=?	Test

Notes

- Before starting the OTA update, set the following parameters:
 - The bearer (CSD or GPRS)
 - APN, through the command AT#OTASNAIPCFG
 - IP port and IP address, through the command AT#OTAIPCFG.
- After setting AT#OTAIPUPD, unsolicited messages inform the user about the update status:
 - #OTAEV: Start Fw Download
 - #OTAEV: Fw Download Complete
 - #OTAEV: Module Upgraded To New FW
 - #OTAEV: Server notified about successful FW Upgrade
 - In case of failure: #OTAEV: OTA FW Upgrade Failed

OTA Set IP port and address for OTA over IP #OTASNAIP

Set command specifies that IP port number and IP address that the module uses to send the Remote Registration message. If the current IMSI hasn't been registered, the Remote Registration message is sent automatically.

Read command reports the current settings in the format:

#OTASNAIP: <IPort>,<IPAddr>[,<company_name>],0

Test command returns the range for <IPort> values and the maximum length of <mynumber> and <company_name> in the format:

#OTASNAIP: (0-65535),,<nlength>,<tlength>

where:

<nlength>	Value indicating the maximum length of field <mynumber>.
<tlength>	Value indicating the maximum length of field <company_name>

Syntax

Command	Command type
AT#OTASNAIP=<IPort>,<IPaddr>[,<mynumber>[,<company_name>[,<unused>]]]	Set
AT#OTASNAIP?	Read
AT#OTASNAIP=?	Test

Parameters and Values

<IPort>	IP port of the OTA server.
<IPaddr>	IP address of the OTA server, string type. This parameter can be any valid IP address in the format xxx.xxx.xxx.xxx.
<mynumber>	String parameter that specifies the client phone number.
<company_name>	String parameter containing a client identifier.

Notes

- Returns an error if:
 - The APN was not set through AT#OTASNAIPCFG
 - <company_name> is an empty string
- To set the IP address to 0.0.0.0, use the Set command
- #OTAIPCFG=<IPort>,""
- Overwrite <IPort> and <IPaddr> parameters from the OTA server by any SMS (Command, RSA Discovery Registration ...)
- Changing the <company_name> causes a new FOTA registration procedure.
- All settings, except <mynumber> are saved in the non-volatile memory.

OTA Set Access Point Name for OTA over IP #OTASNAIPCFG

Set command specifies the bearer (GSM or GPRS) and the APN that the module uses to send the Remote Registration message. For GPRS, APN is the Access Point Name. For GSM bearer is the Internet service provider number.

Read command reports the current settings in the format:

```
#OTASNAIPCFG: <bearer>,<APN>[,<username>[,<password>[,<rspTimeout>]]]
```

Test command returns the range for <bearer> and <rspTimeout> values and the maximum length of <APN>, <username> and <password> string parameters , in the format:

```
#OTASNAIPCFG: (0-2),99,49,49,(0-65535)
```

Syntax

Command	Command type
AT#OTASNAIPCFG=<bearer>,<APN>[,<username>,<password>[,<rspTimeout>]]	Set
AT#OTASNAIPCFG?	Read
AT#OTASNAIPCFG=?	Test

Parameters and Values

<bearer>	IP port of the OTA server.
0	Undefined. Default: 0.
1	GSM.
2	GPRS.
<APN>	String parameter. For GPRS bearer, Access Point Name, which is a logical name used to select the select the GGSN or the external packet data network. For GSM bearer, the Internet service provider phone number.
<username>	String parameter, used only if the context requires it.
<password>	String parameter, used only if the context requires it.
<rspTimeout>	Used when waiting for a response from OTA server, after the module has sent a message. If there's no response within this timeout period, the TCP connection is closed.
0	No timeout.
1-65535	Timeout value in seconds. Default: 300.

Notes

- If the <bearer> is set to 0, then the APN is erased. If the bearer is already 0, any <APN> or <username> or <password> will not be set.
- Overwrite the <bearer>, <APN>, <username>, and <password> by any SMS (Command, RSA Discovery Registration ...)
- All the settings are saved in non-volatile memory.

Multisocket AT Commands

Socket Status #SS

Execute command reports the current status of the socket.

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#SS[=<connId>]	Execute
AT#SS=?	Test

Parameters and Values

<connId> Socket connection identifier.

1-6

The response format is:

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>

where:

<connId> Socket connection identifier.

<state> Actual state of the socket.

- 0 Socket closed.
- 1 Socket with an active data transfer connection.
- 2 Socket suspended.
- 3 Socket suspended with pending data.
- 4 Socket listening.
- 5 Socket with an incoming connection. Waiting for the user accept or shutdown command.

<locIP> IP address associated by the context activation to the socket.

<locPort> If the socket is placed in listen mode, the listening port.
If the socket is used to connect to a remote machine, the local port for the connection.

<remIP> When connected to a remote machine, this is the remote IP address.

<remPort> The port connected to on the remote machine.

Notes

- Issuing #SS<CR> causes getting information about status of all the sockets; the response format is:

#SS: <connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1>
<CR><LF>

...

#SS: <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6>

Examples

AT#SS

#SS: 1,3,91.80.90.162,61119,88.37.127.146,10510

#SS: 2,4,91.80.90.162,1000

#SS: 3,0

#SS: 4,0

#SS: 5,3,91.80.73.70,61120,88.37.127.146,10509

#SS: 6,0

OK

Socket 1: opened from local IP 91.80.90.162/local port 61119 to remote IP 88.37.127.146/remote port 10510 is suspended with pending data

Socket 2: listening on local IP 91.80.90.162/local port 1000

Socket 5: opened from local IP 91.80.73.70/local port 61120 to remote IP 88.37.127.146/remote port 10509 is suspended with pending data

AT#SS=2

#SS: 2,4,91.80.90.162,1000

OK

Information only about socket number 2

Socket Info #SI

Execute command gets information about socket data traffic.

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#SI[=<connId>]	Execute
AT#SI=?	Test

Parameters and Values

<connId> Socket connection identifier.

1-6

The response format is:

#SI: <connId>,<sent>,<received>,<buff_in>,<ack_waiting>

where:

<connId> Socket connection identifier.

<sent> Total amount (in bytes) of sent data since the last time the socket connection identified by <connId> is opened.

<received>	Total amount (in bytes) of received data since the last time the socket connection identified by <connId> is opened.
<buff_in>	Total amount (in bytes) of data just arrived through the socket connection identified by <connId> and currently buffered, not yet read.
<ack_waiting>	Total amount (in bytes) of sent and not yet acknowledged data since the last time the socket connection identified by <connId> is opened. Note: Data not yet acknowledged are available only for TCP connections; the value <ack_waiting> is always 0 for UDP connections.

Notes

- Issuing #SI<CR> causes getting information about data traffic of all the sockets; the response format is:

#SI: <connId1>,<sent1>,<received1>,<buff_in1>,<ack_waiting1>

<CR><LF>

...

#SI: <connId6>,<sent6>,<received6>,<buff_in6>,<ack_waiting6>

Examples

Sockets 1,2,3,6 are opened with some data traffic.

For example, socket 1 has 123 bytes sent, 400 bytes received, 10 byte waiting to be read, and 50 bytes waiting to be acknowledged from the remote side.

```
AT#SI
```

```
#SI: 1,123,400,10,50
```

```
#SI: 2,0,100,0,0
```

```
#SI: 3,589,100,10,100
```

```
#SI: 4,0,0,0,0
```

```
#SI: 5,0,0,0,0
```

```
#SI: 6,0,98,60,0
```

```
OK
```

Information only about socket number 1

```
AT#SI=1
```

```
#SI: 1,123,400,10,50
```

```
OK
```

Context Activation #SGACT

Execute command activates or deactivates either the GSM context or the specified PDP context.

Read returns the state of all the contexts that have been defined through the commands +CGDCONT or #GSMCONT

```
#SGACT: <cid1>,<Stat1><CR><LF>
```

...

```
#SGACT: <cid5>,<Stat5>
```

where:

<cidn>	PDP context identifier.
<statn>	Context status.
0	Context deactivated.
1	Context activated.

Test command reports the range for the parameters <cid> and <stat>.

Syntax

Command	Command type
AT#SGACT=<cid>,<stat>[,<userId>,<pwd>]	Execute
AT#SGACT?	Read
AT#SGACT=?	Test

Parameters and Values

<cid>	PDP context identifier.
0	Specifies the GSM context.
1-5	Numeric parameter, which specifies a particular PDP context definition.
<stat>	
0	Deactivate the context.
1	Activate the context.
<userId>	String type, used only if the context requires it.
<pwd>	String type, used only if the context requires it.

Notes

- It is recommended that you use the same command (for example #SGACT) to activate the context, deactivate it and interrogate its status.
- Context activation/deactivation returns ERROR if there is not any socket associated to it. See AT#SCFG.
- After the GSM context is activated, you can use either Multisocket, or FTP or Email AT commands to send/receive TCP/IP packets via GSM.
- To deactivate the GSM context, issue AT#SGACT=0,0 on the same serial port used when the context was activated.

- GSM context activation is affected by AT+CBST command. In particular, GSM context activation is just allowed with “non transparent” data calls.
- Activating a GSM context while a PDP context is activated suspends the PDP context.
- If GSM context is active, it is not allowed any PDP context activation.

Socket Shutdown #SH

This command closes a socket.

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#SH=<connId>	
AT#SH=?	Test

Parameters and Values

<connId> Socket connection identifier.
1-6

Socket Configuration #SCFG

Set command sets the socket configuration parameters.

Read command returns the current socket configuration parameters values for all the six sockets, in the format:

#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1>

<CR><LF>

...

#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>

<CR><LF>

Test command returns the range of supported values for all the subparameters

Syntax

Command	Command type
AT#SCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>	Set
AT#SCFG?	Read
AT#SCFG=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	
<cid>	PDP context identifier.
0	Specifies the GSM context.
1-5	Numeric parameter that specifies a PDP context definition.
<pktSz>	Packet size used by the TCP/UDP/IP stack for data sending.
0	Select default value of 300 automatically.
1-1500	Packet size in bytes.
<maxTo>	Exchange timeout or socket inactivity timeout. If there is no data exchange within this timeout, the connection is closed.
0	No timeout.
1-65535	Timeout value in seconds. Default: 90.
<connTo>	Connection timeout. If cannot connect to the remote within this period, an error is raised.
10-1200	Timeout value in hundreds of milliseconds. Default: 600.
<txTo>	Data sending timeout. After this period data is sent also if less than maximum packet size.
0	No timeout.
1-255	Timeout value in hundreds of milliseconds. Default: 50.

Notes

- Values are automatically saved in non-volatile memory.
- IF DNS resolution is required, max DNS resolution time (20 sec) has to be considered in addition to <connTo>.

Examples

```
at#scfg?
#SCFG: 1,1,300,90,600,50
#SCFG: 2,2,300,90,600,50
#SCFG: 3,2,250,90,600,50
#SCFG: 4,1,300,90,600,50
#SCFG: 5,1,300,90,600,50
#SCFG: 6,1,300,90,600,50
OK
```

Socket Configuration Extended #SCFGEXT

Set command sets the socket configuration extended parameters

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

```
#SCFGEXT:<connId1>,<srMode1>,<dataMode1>,<keepalive1>,<ListenAutoRsp1>,0<CR><LF>
```

...

```
#SCFGEXT:<connId6>, <srMode6>,<dataMode6>,<keepalive6>,  
<ListenAutoRsp6>,0<CR><LF>
```

Test command returns the range of supported values for all the subparameters

Syntax

Command	Command type
AT#SCFGEXT=<conned>,<srMode>,<recvDataMode>,<keepalive>, [,<ListenAutoRsp> [,<sendDataMode>]]	Set
AT#SCFGEXT?	Read
AT#SCFGEXT=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	
<srMode>	SRing unsolicited mode.
0	Normal. Default: 0.
	SRING : <connId> where <connId> is the socket connection identifier.
1	Data amount.
	SRING : <connId>,<recData> where <recData> is the amount of data received on the socket connection number <connId>.
2	Data view.
	SRING : <connId>,<recData>,<data> same as before and <data> is data received displayed following <dataMode> value.
<recvDataMode>	Data view mode for received data in command mode (AT#SRECV or <srMode> = 2).
0	Text mode. Default: 0.
1	Hexadecimal mode.
<keepalive>	Set the TCP Keepalive value in minutes.
0	Deactivated. Default: 0.
1 – 240	Keepalive time in minutes.
<ListenAutoRsp>	Set the listen auto-response mode, which affects the commands AT#SL and AT#SLUDP.
0	Deactivated. Default: 0.
1	Activated.
<sendDataMode>	Data mode for sending data in command mode (AT#SSEND).
0	Data represented as text. Default: 0.
1	Data represented as sequence of hexadecimal numbers (from 00 to FF). Each octet of the data is given as two IRA character long hexadecimal number.

Notes

- You must set the parameters with #SCFGEXT before establishing a data connection using the AT#SGACT command.
- These values are automatically saved in non-volatile memory.
- Keepalive is available only on TCP connections.
- For the behavior of AT#SL and AT#SLUDP in case of auto-response mode or in case of no auto-response mode, see the description of the two commands.

Examples

Socket 1 set with data view string, text data mode, a keepalive time of 30 minutes and listen auto-response set.

Socket 3 set with data amount string, hex recv data mode, no keepalive and listen auto-response not set.

Socket 4 set with hex recv and send data mode

```
at#scfgext?
#SCFGEXT: 1,2,0,30,1,0
#SCFGEXT: 2,0,0,0,0,0
#SCFGEXT: 3,1,1,0,0,0
#SCFGEXT: 4,0,1,0,0,1
#SCFGEXT: 5,0,0,0,0,0
#SCFGEXT: 6,0,0,0,0,0
OK
```

Socket Configuration Extended 2 #SCFGEXT2

Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command.

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

```
#SCFGEXT2:<connId1>,<bufferStart1>,<abortConnAttempt1>,<stringLen1>,<stringTo1>,<noCarrierMode1><CR>
<LF>

...

#SCFGEXT2:<connId6>,<bufferStart6>,<abortConnAttempt6>,<stringLen6>,<stringTo6>,<noCarrierMode6><CR>
<LF>
```

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#SCFGEXT2=<connId>,<bufferStart>[,<abortConnAttempt>[,<sringLen>[,<sringTo>[,<noCarrierMode>]]]]	Set
AT#SCFGEXT2?	Read
AT#SCFGEXT2=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	
<bufferStart>	Set the sending timeout method based on new data received from the serial port. (<txTo> timeout value is set by #SCFG command). Transmission timer restarts when new data are received from the serial port.
0	Old behavior for transmission timer (#SCFG command 6th parameter old behavior, start only first time if new data are received from the serial port).
1	New behavior for transmission timer: Restart when new data received from serial port.
	Notes: Necessary to avoid overlapping of the two methods. Enabling new method, the old method for transmission timer(#SCFG) is automatically disabled to avoid overlapping.
	Check if new data have been received from serial port is done with a granularity that is directly related to #SCFG <txTo> setting with a maximum period of 1 sec.
<abortConnAttempt>	Enable connection attempt (#SD/#SKTD) abort before CONNECT (online mode) or OK (command mode).
0	Not possible to interrupt connection attempt.
1	It is possible to interrupt the connection attempt (<connTo> set by #SCFG or DNS resolution running if required) and give back control to AT interface by reception of a character.
	As soon as the control is given to the AT interface, the ERROR message is received on the interface itself.
<sringLen>	This parameter sets the length of data received in one SRING URC in sring mode 2 or 3. See AT#SCFGEXT.
0	Means 64 bytes. Default: 0.
1	Means the length is equal to the maximum TCP payload size accepted in download in case of TCP connections, same as 0 in case of UDP connections. 64..1472
<sringTo>	This parameter sets the delay among one SRING URC in sring mode and the other, in 2 or 3. See AT#SCFGEXT.
0	Means 10 hundreds of milliseconds.. Default: 0.
1-10	Value in hundreds of milliseconds.

<noCarrierMode>	This parameter allows NO CARRIER indication when the socket is closed.
0	NO CARRIER:<connID> - Indication is sent as usual without additional information. Default: 0.
1	NO CARRIER:<connID> - Adds indication of current <connID> socket connection identifier.
2	NO CARRIER:<connID>,<cause>. – Adds indication of current <connID> socket connection identifier and closure <cause>. For possible, <cause> values, see #SLASTCLOSURE.

Notes

- Like #SLASTCLOSURE, in case of subsequent consecutive closure causes are received, the original disconnection cause is indicated.
- In the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data (#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.
- Values are automatically saved in non-volatile memory.
- If AT#BASE64 has been set on the same connId, the parameter <sringLen> affects the length of the data read from the socket at each SRING, but this length will always be a multiple of 78 or 76 (depending on the type of decoding set with AT#BASE64) and user will get less due to decoding.

Examples

```
AT#SCFGEXT2=1,1
OK
AT#SCFGEXT2=2,1
OK
AT#SCFGEXT2?
#SCFGEXT2: 1,1,0,0,0,0
#SCFGEXT2: 2,1,0,0,0,0
#SCFGEXT2: 3,0,0,0,0,0
#SCFGEXT2: 4,0,0,0,0,0
#SCFGEXT2: 5,0,0,0,0,0
#SCFGEXT2: 6,0,0,0,0,0
OK
AT#SCFG?
#SCFG: 1,1,300,90,600,50
#SCFG: 2,1,300,90,600,50
#SCFG: 3,1,300,90,600,50
#SCFG: 4,2,300,90,600,50
#SCFG: 5,2,300,90,600,50
#SCFG: 6,2,300,90,600,50
```



```
OK
AT#SCFG=1,1,300,90,600,30
OK
```

Current configuration: socket with connId 1 and 2 are configured with new transmission timer behavior.

<txTo> corresponding value is changed (#SCFG) for connId 1, for connId 2 is left to default value.

Socket Dial #SD

Execute command opens a remote connection through socket.

Test command reports the range of values for all parameters.

Syntax

Command	Command type
AT#SD=<connId>,<txProt>,<rPort>,<IPAddr>[,<closureType>[,<IPort>,<connMode>]]]	Execute
AT#SD=?	Test

Parameters and Values

<connId> 1-6	Socket connection identifier.
<txProt> 0 1	Transmission protocol. TCP. UDP.
<rPort> 1-65535	Remote host port to contact.
<IPAddr>	String type, address of the remote host. Can be either: Any valid IP address in the format: "xxx.xxx.xxx.xxx". Any host name to be solved with a DNS query.
<closureType> 0 255	Socket closure behavior for TCP when remote host has closed. Local host closes immediately when remote host has closed. Default: 0. Local host closes after an escape sequence (+++) or immediately in case of an abortive disconnect from remote.
<IPort> 1-65535	UDP connections local port.
<connMode> 0 1	Connection mode. Online mode connection. Default: 0. Command mode connection.

Notes

- <closureType> parameter is valid for TCP connections only and has no effect (if used) for UDP connections.
- <IPort> parameter is valid for UDP connections only and has no effect (if used) for TCP connections.
- If <connMode> is set to online mode connection and the command is successful online data mode is entered, with the intermediate result code CONNECT. After the CONNECT, you can suspend the direct interface to the socket connection (the socket stays open) using the escape sequence (+++): the module moves back to command mode and you receive the final result code OK after the suspension. After such a suspension, it's

possible to resume it in every moment (unless the socket inactivity timer timeouts, see #SCFG) by using the #SO command with the corresponding <connId>.

- If you set <connMode> to command mode connection and the command is successful, the socket is opened, you remain in command mode and the result code OK appears.
- If input data arrives through a connected socket and the device enters command mode before the data was read, the data is buffered and the SRING URC is received (SRING format depends on the last #SCFGEXT setting). Issue the #SRECV command to read this data. It is also possible to send data while in command mode by issuing #SEND.
- Resume of the socket (#SO) after suspension or closure (#SH) has to be done on the same instance on which the socket was opened through #SD. In fact, suspension is done on the instance itself

Examples

Open socket 1 in online mode

```
AT#SD=1,0,80,"www.google.com",0,0,0
CONNECT
```

...

Open socket 1 in command mode

```
AT#SD=1,0,80,"www.google.com",0,0,1
OK
```

Socket Restore #SO

When issued in command mode, the execute command causes device to leave command mode and enter into a direct interface with the specified socket connection index.

Test command reports the range of values for <connId> parameter.

Syntax

Command	Command type
AT#SO=<connId>	Execute
AT#SO=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	

Socket Listen #SL

Set command opens or closes a socket listening for an incoming TCP connection on a specified port.

Read command returns all the actual listening TCP sockets.

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#SL=<connId>,<listenState>,<listenPort>>[,<closure type>]	Set
AT#SL?	Read
AT#SL=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	
<listenState>	
0	Closes socket listening.
1	Starts socket listening.
<listenPort>	Local listening port.
1-65535	
<closure type>	Socket closure behavior for TCP.
0	Local host closes immediately when remote host has closed. Default: 0.
255	Local host closes after an escape sequence (+++).

Notes

- If successful, the command returns a final result code OK.
- If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when a TCP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), an URC is received:
+SRING : <connId>

Use #SA command to accept the connection or #SH command to refuse it.
- If the ListenAutoRSP flag is set when a TCP connection request is received on the local listening port, the connection is automatically accepted as long as the IP address of the device originating the connection has been defined in the internal firewall (see #FRWL.) Once accepted the CONNECT indication is given and the modem goes into online data mode.
- If the network closes the socket, the following URC is received:
#SL:ABORTED
- When closing the listening socket you do not need to specify the <listenPort> value.

Examples

Next command opens a socket listening for TCP on port 3500 without.

```
AT#SL=1,1,3500
```

```
OK
```

Socket Listen UDP #SLUDP

Set command opens or closes a socket listening for an incoming UDP connection on a specified port.

Read command returns all the actual listening UDP sockets.

Test command returns the range of supported values for all subparameters.

Syntax

Command	Command type
AT#SLUDP=<connId>,<listenState>,<listenPort>	Set
AT#SLUDP?	Read
AT#SLUDP=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	
<listenState>	
0	Closes socket listening.
1	Starts socket listening.
<listenPort>	Local listening port.
1-65535	

Notes

- If successful, the command returns a final result code OK.
- If the ListenAutoRsp flag is not set through the command AT#SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), a URC is received:
+SRING : <connId>

Afterwards, use #SA to accept the connection or #SH to refuse it.
- If the ListenAutoRsp flag is set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command #FRWL), the connection is automatically accepted: the CONNECT indication is given and the modem goes into online data mode.
- If the network closes the socket the following URC is received:
#SLUDP: ABORTED
- When closing the listening socket you do not need to specify the <listenPort> value.

Examples

Next command opens a socket listening for UDP on port 3500.

```
AT#SLUDP=1,1,3500
```

```
OK
```

Socket Accept #SA

Execute command accepts an incoming socket connection after an URC SRING: <connId>.

Test command reports the range of values for all the parameters.

Syntax

Command	Command Type
AT#SA=<connId>[,<connMode>]	Execute
AT#SA=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	
<connMode>	Connection mode, as for command #SD.
0	Online mode connection. Default: 0.
1	Command mode connection.

Notes

- The SRING URC has to be a consequence of a #SL issue.
- Setting the command before to having received a SRING results in an ERROR indication, giving the information that a connection request has not yet been received.

Receive Data in Command Mode #SRECV

Execute command permits the user to read data arrived through a connected socket, but buffered and not yet read because the module entered command mode before reading them; the module is notified of these data by a SRING URC, whose presentation format depends on the last #SCFGEXT setting.

Test command returns the range of supported values for <connId> and <maxByte>.

Syntax

Command	Command type
AT#SRECV=<connId>,<maxByte>,[<UDPIInfo>]	Execute
AT#SRECV=?	Test

Parameters and Values

<connId> 1-6	Socket connection identifier.
<maxByte> 1-1500	Maximum number of bytes to read.
<UDPIf> 0 1	<p>UDP information disabled. Default: 0.</p> <p>UDP information enabled. Data are read just until the end of the UDP datagram and the response carries information about the remote IP address and port and about the remaining bytes in the datagram.</p>

AT#SRECV=<connId>,<maxBytes>,1
 #SRECV: <sourceIP>,<sourcePort><connId>,<recData>,<dataLeft>
 Data

Notes

- Issuing #SRECV when there's no buffered data raises an error.

Examples

SRING URC (<srMode> be 0, <dataMode> be 0) telling data have just come through connected socket identified by <connId>=1 and are now buffered.

SRING: 1

Read in text format the buffered data

```
AT#SRECV=1,15
#SRECV: 1,15
the test string
OK
```

Or:

if the received datagram, received from <IPaddr> and <IPport> is of 15 bytes

```
AT#SRECV=1,15,1
#SRECV: <IPaddr>,<IPport>,1,15,45
the test string
OK
```

SRING URC (<srMode> be 1, <dataMode> be 1) telling 15 bytes data have just come through connected socket identified by <connId>=2 and are now buffered

SRING: 2,15

Read in hexadecimal format the buffered data

```
AT#SRECV=2,15
```

```
#SRECV: 2,15
```

```
746865207465737420737472696e67
```

```
OK
```

Or:

If the received datagram, received from <IPaddr> and <IPport> is of 60 bytes

```
AT#SRECV=2,15
```

```
#SRECV: <IPaddr>,<IPport>,2,15,45
```

```
746865207465737420737472696e67
```

```
OK
```

SRING URC (<srMode> be 2, <dataMode> be 0) displaying (in text format) 15 bytes data that have just come through connected socket identified by <connId>=3. It is not necessary to issue #SRECV to read the data; no data remain in the buffer after this URC.

```
SRING: 3,15, the test string
```

Send Data in Command Mode #SEND

Execute command permits, while the module is in command mode, to send data through a connected socket.

Test command returns the range of supported values for parameter <connId>.

Syntax

Command	Command type
AT#SEND=<connId>	Execute
AT#SEND=?	Test

Parameters and Values

<connId>	Socket connection identifier.
1-6	<p>The device responds to the command with the prompt '>' (<greater_than><space>) and waits for the data to send.</p> <p>To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex).</p> <p>If data is successfully sent, the response is OK.</p> <p>If data sending fails for some reason, an error code is reported.</p>

Notes

- The maximum number of bytes to send is 1500 bytes for TCP and 1472 for UDP. Trying to send more data causes the surplus to be discarded and lost.
- It is possible to use #SEND only if the connection was opened by #SD, else the ME is raising an error.
- A byte corresponding to BS char(0x08) is treated with its corresponding meaning; therefore previous byte is cancelled (and BS char itself is not sent)

Examples

Send data through socket number 2

```
AT#SSEND=2
>Test<CTRL-Z>
OK
```

Send Data in Command Mode Extended #SSENDEXT

While the module is in command mode, this Execute command sends data through a connected socket including all possible octets (from 0x00 to 0xFF).

Test command returns the range of supported values for <connId> and <bytetosend>.

Syntax

Command	Command type
AT#SSENDEXT=<connId>,<bytetosend>	Execute
AT#SSENDEXT=?	Test

Parameters and Values

<connId> 1-6	Socket connection identifier.
<bytetosend>	<p>Number of bytes to be sent.</p> <p>To obtain the range use test command.</p> <p>The device responds to the command with the prompt '>' (<greater_than><space>) and waits for the data to send.</p> <p>When <bytetosend> bytes are sent, operation is automatically completed.</p> <p>If data are successfully sent, then the response is OK.</p> <p>If data sending fails for some reason, an error code is reported.</p>

Notes

- You can only use #SSENDEXT if #SD opened the connection. Otherwise, the ME raises an error.
- All special characters are sent like a generic byte. For example, 0x08 is sent through the socket and does not behave like a BS, that is, previous character is not deleted.

Examples

Open the socket in command mode:

```
at#sd=1,0,<port>,"IP address",0,0,1
OK
```

Give the command specifying total number of bytes as second parameter:

```
at#ssendext=1,256
> ..... ; // Terminal echo of bytes sent is displayed here
OK
```

All possible bytes (from 0x00 to 0xFF) are sent on the socket as generic bytes.

IP Stack Authentication Type #SGACTAUTH

Set command sets the authentication type for IP Easy.

This command affects the authentication mode used on AT#SGACT or AT#GPRS commands.

Read command reports the current IP Stack authentication type, in the format:

#SGACTAUTH: <type>

Test command returns the range of supported values for <type>.

Syntax

Command	Command type
AT#SGACTAUTH=<type>	Set
AT#SGACTAUTH?	Read
AT#SGACTAUTH=?	Test

Parameters and Values

<type>	
0	No authentication.
1	PAP authentication. Default: 1.
2	CHAP authentication.

Notes

- The parameter is not saved in non-volatile memory
- PAP Authentication is default when AT#SGACT contains username e/o password.
- No Authentication is default when AT#SGACT doesn't contain username and password.

Context Activation and Configuration #SGACTCFG

Execute command enables or disables the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every GPRS Attach or after a NW PDP CONTEXT deactivation if at least one socket is configured to this context. See AT#SCFG.

Read command reports the state of all the five contexts, in the format:

#SGACTCFG: <cid1>,<retry1>,<delay1>, <urcmode><CR><LF>

...

#SGACTCFG: <cid5>,<retry5>,<delay5>,<urcmode>

where the following are as in the Parameters and Values section, which follows:

<cidn>
<retryn>
<delayn>
<urcmode>

Test command reports supported range of values for <cid>, <retry>, <delay> and <urcmode>.

Syntax

Command	Command type
AT#SGACTCFG=<cid>,<retry>[,<delay>[,<urcmode>]]	Execute
AT#SGACTCFG?	Read
AT#SGACTCFG=?	Test

Parameters and Values

<cid>	PDP context identifier. See +CGDCONT.
1-5	Numeric parameter, which specifies a particular PDP context definition.
<retry>	Numeric parameter, which specifies the maximum number of context activation, attempts in case of activation failure. Range is 0 – 15.
0	Disable the automatic activation/reactivation of the context. Default: 0.
<delay>	Numeric parameter, which specifies the delay in seconds between an attempt and the next one. Range is 180 – 3600.
<urcmode>	URC presentation mode.
0	Disable unsolicited result code. Default: 0.
1	Enable unsolicited result code, after an automatic activation/reactivation, of the local IP address obtained from the network. It has meaning only if <auto>=1. The unsolicited message is in the format:
	#SGACT: <ip_address> reporting the local IP address obtained from the network.

Notes

- The URC presentation mode <urcmode> is related to the current AT instance only. Last <urcmode> setting is saved for every instance as extended profile parameter. You cannot restore it even if the multiplexer control channel is released and set up, back and forth.
- <retry> and <delay> setting are global parameters saved in non-volatile memory.
- If the automatic activation is enabled on a context, then you cannot use the command AT#SCFG to modify the association between the context itself and the socket connection identifier. If the socket is not connected, you can modify all the other parameters of command AT#SCFG.

Context Activation and Configuration Extended #SGACTCFGEXT

Execute command enables new features related to context activation.

Read command reports the state of all the five contexts, in the format:

```
#SGACTCFGEXT: <cid1>,<abortAttemptEnable1>,0,0,0<CR><LF>
```

...

```
#SGACTCFGEXT: <cid5>,<abortAttemptEnable5>,0,0,0<CR><LF>
```

where:

<cid>	PDP context identifier.
<abortAttemptEnable n>	See <abortAttemptEnable> in the Parameters and Values section that follows.

Test command reports supported range of values for all parameters.

Syntax

Command	Command type
AT#SGACTCFGEXT=<cid>,<abortAttemptEnable>[,<unused>[,<unused>[,<unused>]]]	Execute
AT#SGACTCFGEXT?	Read
AT#SGACTCFGEXT=?	Test

Parameters and Values

<cid>	PDP context identifier. See +CGDCONT.
1-5	Numeric parameter that specifies a PDP context definition.
<abortAttemptEnable>	
0	Old behavior. Abort not possible while attempting context activation.
1	Abort during context activation attempt is possible by sending a byte on the serial port. It takes effect on successive GPRS context activation attempt through #SGACT command in the following manner. While waiting for AT#SGACT=<cid>,1 response (up to 150 s) is possible to abort attempt by sending a byte and get back AT interface control (NO CARRIER indication).

Notes

- Values are automatically saved in non-volatile memory.
- If you receive delayed CTXT ACTIVATION ACCEPT after abort, network is automatically informed of the aborted attempt through relative protocol messages (SM STATUS) and closes on its side.

Otherwise, if no ACCEPT is received after abort, network is informed later of PDP state through other protocol messages, for example, routing area update.
- Reference: V.25ter

PAD Command Features #PADCMD

This command sets features of the pending data flush to socket, opened with AT#SD command.

Read command reports the currently selected <mode> in the format:

#PADCMD: mode

Test command reports the supported range of values for parameter <mode>.

Syntax

Command	Command type
AT#PADCMD=<mode>	Set
AT#PADCMD?	Read
AT#PADCMD=?	Test

Parameters and Values

<mode>

Bit 1:

- 1** Enable forwarding.
- 0** Disable forwarding.
- Other bits reserved.

Notes

- Forwarding depends on character defined by AT#PADFWD.

PAD Forward Character #PADFWD

This command sets the char that immediately flushes pending data to socket, opened with AT#SD command.

Read command reports the currently selected <char> and <mode> in the format:

#PADFWD: <char>,mode

Test command reports the supported range of values for <char> and <mode>.

Syntax

Command	Command type
AT#PADFWD=<char>[,<mode>]	Set
AT#PADFWD?	Read
AT#PADFWD=?	Test

Parameters and Values

<char>

A number, from 0 to 255, that specifies the ASCII code of the character used to flush data.

<mode>

Flush mode.

- 0** Normal mode. **Default: 0.**
- 1** Reserved.

Notes

- Use AT#PADCMD to enable the socket char-flush activity.

Base64 Encoding/Decoding of Socket Sent/Received Data #BASE64

Set command enables base64 encoding and/or decoding of data sent/received to/from the socket in online or in command mode.

Read command returns the current <enc>/<dec> settings for all the six sockets, in the format:

```
#BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>
```

...

```
#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>
```

Test command returns the range of supported values for all the subparameters.

Syntax

Command	Command type
AT#BASE64=<connId>,<enc>,<dec> [,<unused_B > [,<unused_C >]]	Set
AT#BASE64?	Read
AT#BASE64=?	Test

Parameters and Values

- <connId>

1-6

Socket connection identifier.
- <enc>

0

No encoding of data received from serial port.

1

MIME RFC2045 base64 encoding of data received from serial port that has to be sent to <connId> socket.

Note: As indicated from RFC2045 the encoded output stream is represented in lines of no more than 76 characters each.
Lines are defined as sequences of octets separated by a CRLF sequence.

2

RFC 3548 base64 encoding of data received from serial port that has to be sent to <connId> socket.

Note: As indicated from RFC3548 CRLF has not to be added.
- <dec>

0

No decoding of data received from socket <connId>.

1

MIME RFC2045 base64 decoding of data received from socket <connId> and sent to serial port.
Same rule as for <enc> regarding line feeds in the received file that has to be decoded.

2

RFC3548 base64 decoding of data received from socket <connId> and sent to serial port.
Same rule as for <enc> regarding line feeds in the received file that has to be decoded.

Notes

- You can use the command to change current <enc>/<dec> settings for a socket already opened in command mode or in online mode after suspending it. You must set AT#SKIPESC=1.
- To use #BASE64 in command mode, if data to send exceeds maximum value for #SENDEXT command, you must divide the data into multiple parts.

These parts have to be a multiple of 57 bytes, except for the last one, to distinguish EOF condition.

(Base64 encoding rules)

For the same reason if #SRECV command is used by the application to receive data, a multiple of 78 bytes has to be considered.

- To use #SRECV to receive data with <dec> enabled, it is necessary to consider that reading <maxByte> bytes from socket, the user gets less due to decoding that is performed.
- Values are automatically saved in non-volatile memory.
- Read command returns the current <enc>/<dec> settings for all the six sockets, in the format:

```
#BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>
```

...

```
#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>
```

Examples

```
AT#SKIPESC=1
```

```
OK
```

```
AT#SD=<connId>,<txProt>,<rPort>,<IPAddr>
```

```
CONNECT
```

//Data sent without modifications. Default.

```
.....
```

```
+++ (suspension)
```

```
OK
```

```
at#base64=<connId>,1,0
```

```
OK
```

```
AT#SO=<connId>
```

```
CONNECT
```

// Data received from serial port is base64 encoded before sent on the socket.

```
.....
```

```
+++ (suspension)
```

```
OK
```

```
at#base64=<connId>,0,1
```

OK

AT#SO=<connId>

CONNECT

// Data received from socket is base64 decoded before sent on the serial port.

+++ (suspension)

.....

Send UDP Data to a Specific Remote Host #SSENDUDP

While the module is in command mode, this command sends data over UDP to a specific remote host.

UDP connection has to be previously completed with a first remote host through #SLUDP / #SA.

Then, if data is received from this or another host, data can be sent to it.

Like command #SSEND, the device responds with '>' and waits for the data to send.

Test command reports the supported range of values for <connId>, <remoteIP> and <remotePort>

Syntax

Command	Command type
AT#SSENDUDP=<connId>,<remoteIP>,<remotePort>	
AT#SSENDUDP=?	Test

Parameters and Values

<connId> 1-6	Socket connection identifier.
<remoteIP>	String type, IP address of the remote host in dotted decimal notation "xxx.xxx.xxx.xxx".
<remotePort> 1-65535	Remote host port.

Notes

- After SRING that indicates incoming UDP data and issuing #SRECV to receive data itself, through #SS is possible to check last remote host (IP/Port).
- If successive resume of the socket to online mode is performed (#SO), connection with first remote host is restored.

Examples

Starts listening on <LocPort>(previous setting of firewall through #FRWL has to be done)

AT#SLUDP=1,1,<LocPort>

OK

SRING: 1 // UDP data from a remote host available

AT#SA=1,1

```
OK
SRING: 1
AT#SI=1
#SI: 1,0,0,23,0 // 23 bytes to read
OK
AT#SRECV=1,23
#SRECV:1,23
message from first host
OK
AT#SS=1
#SS: 1,2,<LocIP>,<LocPort>,<RemIP1>,<RemPort1>
OK
AT#SSENDUDP=1,<RemIP1>,<RemPort1>
>response to first host
OK
SRING: 1 // UDP data from a remote host available
AT#SI=1
#SI: 1,22,23,24,0 // 24 bytes to read
OK
AT#SRECV=1,24
#SRECV:1,24
message from second host
OK
AT#SS=1
#SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2>
OK
```

Remote host has changed; you want to send a response:

```
AT#SSENDUDP=1,<RemIP2>,<RemPort2>
>response to second host
OK
```


Send UDP Data to Specific Remote Host Extended #SENDUDPEXT

While the module is in command mode, this command allows the sending of data over UDP to a specific remote host including all possible octets (from 0x00 to 0xFF).

As indicated about #SENDUDP:

UDP socket has to be previously opened through #SLUDP / #SA, and then you can send data to different remote hosts.

Like #SENDEXT, the device responds with the prompt '>' and waits for the data to send, operation is automatically completed when <bytestosend> are sent.

Test command reports the supported range of values for <connId>, <bytestosend>, <remoteIP> and <remotePort>.

Syntax

Command	Command type
AT#SENDUDPEXT=<connId>,<bytestosend>,<remoteIP>,<remotePort>	
AT#SENDUDPEXT=?	Test

Parameters and Values

<connId>

1-6

Socket connection identifier.

<bytestosend>

1-1472

Number of bytes to be sent.

<remoteIP>

String type, IP address of the remote host in dotted decimal notation: "xxx.xxx.xxx.xxx".

<remotePort>

1-65535

Remote host port.

Socket Type #ST

Set command reports the current type of the socket (TCP/UDP) and its direction (Dialer / Listener).

Test command reports the range for parameter <connId>.

Syntax

Command	Command type
AT#ST[=<ConnId>]	Set
AT#ST=?	Test

Parameters and Values

<ConnId>

1-6

Socket connection identifier.

The response format is:

#ST: <connId>,<type>,<direction>

where:

<connId>	Socket connection identifier.
<type>	Socket type:
0	No socket.
1	TCP socket.
2	UDP socket.
<direction>	Direction of the socket.
0	No.
1	Dialer.
2	Listener.

Notes

- Issuing #ST<CR> gets information about type of all the sockets; the response format is:

```
#ST: <connId1>,<type1>,<direction1>
```

```
<CR><LF>
```

```
...
```

```
#ST: <connId6>,< type 6>,< direction 6>
```

Examples

Single socket:

```
AT#ST=3
```

```
#ST: 3,2,1
```

Socket 3 is an UDP dialer.

All sockets:

```
AT#ST
```

```
#ST: 1,0,0
```

```
#ST: 2,0,0
```

```
#ST: 3,2,1
```

```
#ST: 4,2,2
```

```
#ST: 5,1,1
```

```
#ST: 6,1,2
```

Socket 1 is closed.

Socket 2 is closed.

Socket 3 is UDP dialer.

Socket 4 is UDP listener.

Socket 5 is TCP dialer.

Socket 6 is TCP listener.

Detect the Cause of Socket Disconnection #SLASTCLOSURE

Execute command reports socket disconnection cause.

Test command reports the supported range for parameter <connId>.

Syntax

Command	Command type
AT#SLASTCLOSURE=[<connId>]	Execute
AT#SLASTCLOSURE=?	Test

Parameters and Values

<connId>

1-6

Socket connection identifier.

The response format is:

#SLASTCLOSURE: <connId>,<cause>

where:

<connId> - Socket connection identifier, as before

<cause> - Socket disconnection cause:

0 - Not available (socket has not yet been closed)

1 - Remote host TCP connection close due to FIN/END: normal remote disconnection decided by the remote application.

2 - Remote host TCP connection close due to RST, all others cases in which the socket is aborted without indication from peer (for instance because peer doesn't send after maximum number of retransmissions/peer is no more alive).

All these cases include all the "FATAL" errors after recv or send on the TCP socket (named as different from EWOULDBLOCK).

3 - Socket inactivity timeout.

4 - Network deactivation (PDP context deactivation from network).

Notes

- To receive the socket disconnection reason for all sockets, issue #SLASTCLOSURE<CR>.
- Any time a socket is re-opened, the last disconnection cause is reset. Command reports 0 (not available).
- User closure cause (#SH) is not considered. If a user closure is performed after remote disconnection, remote disconnection cause remains saved and is not overwritten.
- If more consecutive closure causes are received, the original disconnection cause is saved. For instance, if a TCP FIN is received from remote and later a TCP RST because we continue to send data, FIN cause is saved and not overwritten.
- For <closureType>(#SD) set to 255, if the socket has not yet been closed by user after the escape sequence, #SLASTCLOSURE indicates remote disconnection cause if it has been received.
- For UDP, cause 2 indicates abnormal (local) disconnection. Cause 3 and 4 are still possible. Cause 1 is obviously never possible.

FTP AT Commands

FTP Time-Out #FTPTO

Set command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

Read command returns the current FTP operations time-out, in the format:

#FTPTO: <tout>

Test command returns the range of supported values for parameter <tout>

Syntax

Command	Command type
AT#FTPTO=<tout>]	Set
AT#FTPTO?	Read
AT#FTPTO=?	Test

Parameters and Values

<tout>	Time out in 100 ms units.
100-5000	Hundreds of ms. Default: 100.

Notes

- The parameter is not saved in non-volatile memory.
- If <tout> is omitted, the set command is the same as read command.

FTP Open #FTPOPEN

Execute command opens an FTP connection toward the FTP server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPOPEN=[<server:port>,<username>,<password>[,<mode>]]	Execute
AT#FTPOPEN=?	Test

Parameters and Values

<server:port>	String type, address, and port of FTP server. Default: port 21.
<username>	String type, authentication user identification string for FTP.
<password>	String type, authentication password for FTP.
<mode>	
0	Active mode. Default: 0.
1	Passive mode.

Notes

- Before opening an FTP connection either the GSM context must have been activated by AT#SGACT=0,1 or the PDP context #1 must have been activated by AT#SGACT=1,1 or by AT#GPRS=1.

FTP Close #FTPCLOSE

Execute command closes an FTP connection.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPCLOSE	Execute
AT#FTPCLOSE=?	Test

FTP Put #FTPPUT

Execute command, issued during an FTP connection, opens a data connection and starts sending <filename> file to the FTP server. If the data connection succeeds, a CONNECT indication is sent. When the socket is closed, a NO CARRIER indication is sent.

Test command reports the supported range of values for <filename> and <connMode>.

Syntax

Command	Command type
AT#FTPPUT=[[<filename>],[<connMode>]]	Execute
AT#FTPPUT=?	Test

Parameters and Values

<filename>	String type, name of the file. Maximum length 200 characters.
<connMode>	
0	Online mode.
1	Command mode.

Notes

- To close the data connection, use the escape sequence +++.
- If no FTP connection is open, the command returns an ERROR result code.
- If you set <connMode> to 1, the data connection is opened. You remain in command mode and see the result code OK, instead of CONNECT.

FTP Get #FTPGET

Execute command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server. If the data connection succeeds a CONNECT indication is sent. The file is received on the serial port.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPGET=[<filename>]	Execute
AT#FTPGET=?	Test

Parameters and Values

<filename> String type, file name.

Notes

- The Execute command causes an ERROR result code to be returned if no FTP connection is open.
- The application must always handle command closure. To avoid download stall situations, the application can implement a timeout.

FTP GET in Command Mode #FTPGETPKT

Execute command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server while remaining in command mode.

The data port is opened, the device remains in command mode, and the result code OK is seen.

Retrieval from FTP server of “remotefile” is started, but data is only buffered in the module.

It is possible to read data afterwards issuing #FTPRECV command

Read command reports current download state for <filename> with <viewMode> chosen, in the format:

#FTPGETPKT: <remotefile>,<viewMode>,<eof>

where:

<filename>	As in Parameters and Values.
<viewMode>	As in Parameters and Values.
<eof>	
0	File currently being transferred
1	Complete file is transferred to FTP client

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPGETPKT=<filename>[,<viewMode>]	Execute
AT#FTPGETPKT?	Read
AT#FTPGETPKT=?	Test

Parameters and Values

<filename>	String type, file name.
<viewMode>	Permit to choose view mode. Text format or hexadecimal.
0	Text format. Default: 0.
1	Hexadecimal format.

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.
- The application always handles command closure. To avoid download stall situations ensure the application implements a timeout.

FTP Type #FTPTYPE

Set command, issued during an FTP connection, sets the file transfer type.

Read command returns the current file transfer type, in the format:

#FTPTYPE: <type>

Test command returns the range of available values for parameter <type>:

#FTPTYPE: (0,1)

Syntax

Command	Command type
AT#FTPTYPE=<type>	Set
AT#FTPTYPE?	Read
AT#FTPTYPE=?	Test

Parameters and Values

<type>	File transfer type.
0	Binary.
1	ASCII.

Notes

- The command causes an ERROR result code if no FTP connection is opened.

FTP Read Message #FTPMSG

Execute command returns the last response from the server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPMSG	Execute
AT#FTPMSG=?	Test

FTP Delete #FTPDELE

Execute command, issued during an FTP connection, deletes a file from the remote working directory.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPDELE=<filename>	Execute
AT#FTPDELE=?	Test

Parameters and Values

<filename> String type indicating the name of the file to delete.

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.
- If the server response is delayed, check if ERROR indication is temporary due to timing out while waiting.
In this case, #FTPMSG response results temporary empty.

Checking later #FTPMSG response matches with delayed server response.

FTP Print Working Directory #FTPPWD

Execute command, issued during an FTP connection, shows the current working directory on FTP server.

Test command returns the OK result code

Syntax

Command	Command type
AT#FTPPWD	Execute
AT#FTPPWD=?	Test

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.

FTP Change Working Directory #FTPCWD

Execute command, issued during an FTP connection, changes the working directory on FTP server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPCWD=[<dirname>]	Execute
AT#FTPCWD=?	Test

Parameters and Values

<dirname> String type, name of the new working directory.

Notes

- The Execute command causes an ERROR result code if no FTP connection is open.

FTP List #FTPLIST

Execute command, issued during an FTP connection, opens a data connection and starts getting from the server the list of contents of the specified directory or the properties of the specified file.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPLIST[=<name>]]	Execute
AT#FTPLIST=?	Test

Parameters and Values

<name> Sting type, name of the directory or file.

Notes

- The Execute command causes an ERROR result code to be returned if no FTP connection is opened yet.
- Issuing AT#FTPLIST<CR> opens a data connection and starts getting from the server the list of contents of the working directory.

Get File Size #FTPFSIZE

Execute command, issued during an FTP connection, permits to get file size of <filename> file.

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPFSIZE=<filename>	Execute
AT#FTPFSIZE=?	Test

Notes

- Issue FTPTYPE=0 command before FTPFSIZE command, to set file transfer type to binary mode.

FTP Append #FTPAPP

Execute command, issued during an FTP connection, opens a data connection and append data to existing <filename> file. If the data connection succeeds, a CONNECT indication is sent, afterward a NO CARRIER indication is sent when the socket is closed.

Test command reports the supported range of values for <filename> and <connMode>.

Syntax

Command	Command type
AT#FTPAPP=[[<filename>],<connMode>]	Execute
AT#FTPAPP=?	Test

Parameters and Values

<filename> String type, name of the file.

<connMode>

- 0 Online mode.
- 1 Command mode.

- If you set <connMode> to 1, the data connection is opened. You remain in command mode and see the result code OK, instead of CONNECT.
- Use the escape sequence +++ to close the data connection.
- The command causes an ERROR result code to be returned if no FTP connection is opened yet.

```
AT#FTPRECV?
#FTPRECV: 3000
OK
```

```
AT#FTPRECV=400
#FTPRECV: 400
Text row number 1 * 11111111111111111111111111111111 *
Text row number 2 * 22222222222222222222222222222222 *
Text row number 3 * 33333333333333333333333333333333 *
Text row number 4 * 44444444444444444444444444444444 *
Text row number 5 * 55555555555555555555555555555555 *
Text row number 6 * 66666666666666666666666666666666 *
Text row number 7 * 77777777777777777777777777777777 *
Text row number 8 * 88888888888888888888888888888888
OK
```

[illegible]

```
AT#FTPGETPKT?
#FTPGETPKT: sample.txt,0,1
OK
(<eof> set to 1)
```

Send Data on FTP Data Port while in Command Mode #FTPAPPEXT

Execute command sends data on a FTP data port while the module is in command mode. FTP data port must be previously opened through #FTPPUT (or #FTPAPP) with <connMode> parameter set to command mode connection.

Test command reports the supported range of values for <bytestosend> and <eof>.

Syntax

Command	Command type
AT#FTPAPPEXT=<bytestosend>[,<eof>]	Execute
AT#FTPAPPEXT=?	Test

Parameters and Values

<bytestosend>	Number of bytes to be sent.
1-1500	
<eof>	Data port closure.
0	Normal sending of data chunk.
1	Close data port after sending data chunk.

The device responds to the command with the prompt <greater_than><space> and waits for the data to send. When <bytestosend> bytes have been sent, operation is automatically completed.

If (all or part of the) data are successfully sent, then the response is:

#FTPAPPEXT: <sentbytes>

OK

Where <sentbytes> are the number of sent bytes.

Notes

- <sentbytes> can be less than <bytestosend>
- If data sending fails for some reason, an error code is reported.

Examples

```
AT#FTPOPEN="IP",username,password
```

OK

```
AT#FTPPUT=<filename>,1 -> the new param 1 means that we open the connection in command mode
```

OK

// Here data socket will stay opened, but interface is available (command mode)

```
AT#FTPAPPEXT=Size
```

>... write the binary data here. As soon size bytes are written, data are sent and OK is returned

```
#FTPAPPEXT: <SentBytes>
```

OK

.....

// Last #FTPAPPEXT will close the data socket, because second (optional) parameter has this meaning:

AT#FTPAPPEXT=Size,1

>...write the binary data. As soon size byte is written, data is sent and OK is returned.

#FTPAPPEXT: <SentBytes>

OK

// If the user has to reopen the data port to send another (or append to the same) file, he can restart with the FTPPUT (or FTPAPP.)

//Then FTPAPPEXT,... to send the data chunks on the reopened data port.

// Note: If while sending the chunks the data port is closed from remote, user will be aware of it because #FTPAPPEXT indicates ERROR and cause (available if previously issued the command AT+CME=2) will indicate that socket has been closed. Also in this case, data port must be reopened with FTPPUT and so on...(same sequence)

Set Restart Position # FTPREST

Set command sets the restart position for successive FTPGET (or FTPGETPKT) command. It allows you to restart a previously interrupted FTP download from the selected position in byte.

Read command returns the current <restartposition>

#FTPREST: <restartposition>

Test command returns the OK result code.

Syntax

Command	Command type
AT#FTPREST=<restartposition>	Set
AT#FTPREST?	Read
AT#FTPREST=?	Test

Parameters and Values

<restartposition> Position in byte of restarting for successive FTPGET (or FTPGETPKT).

Notes

- Issue FTPTYPE=0 before successive FTPGET (or FTPGETPKT command) to set binary file transfer type.
- Setting <restartposition> has effect on successive FTP download.
After successive successfully initiated FTPGET (or FTPGETPKT) command, <restartposition> is automatically reset.
- Value set for <restartposition> has effect on next data transfer(data port opened by FTPGET or FTPGETPKT).
Then <restartposition> value is automatically assigned to 0 for next download.

Receive Data in Command Mode #FTPRECV

Execute command permits the user to transfer at most <blocksize> bytes of remote file, if retrieving from the FTP server is started with a previous #FTPGETPKT command, onto the serial port.

This number is limited to the current number of bytes of the remote file transferred from the FTP server.

Read command reports the number of bytes currently received from FTP server, in the format:

#FTPRECV: <available>

Test command returns the range of supported values for <blocksize> parameter.

Syntax

Command	Command type
AT#FTPRECV=<blocksize>	Execute
AT#FTPRECV?	Read
AT#FTPRECV=?	Test

Parameters and Values

<blocksize> Maximum number of bytes to read.
1-3000

Notes

- You must have previously opened FTP data port and started download and buffering of remote file through #FTPGETPKT command.
- Issuing #FTPRECV when there is no FTP data port opened raises an error.
- Data port stays open if socket is temporary waiting to receive data (FTPRECV returns 0 and FTPGETPKT gives an EOF 0 indication).

Examples

```
AT#FTPRECV?
```

```
#FTPRECV: 3000
```

```
OK
```

Read required part of the buffered data:

```
AT#FTPRECV=400
```

```
#FTPRECV: 400
```

```
Text row number 1 * 11111111111111111111111111111111 *
Text row number 2 * 22222222222222222222222222222222 *
Text row number 3 * 33333333333333333333333333333333 *
Text row number 4 * 44444444444444444444444444444444 *
Text row number 5 * 55555555555555555555555555555555 *
Text row number 6 * 66666666666666666666666666666666 *
Text row number 7 * 77777777777777777777777777777777 *
```

OK

```
#FTPRECv: 200
```

88888 *

Text row number 10 * AAAAAAAAAAAAAAAAAAAAAAAAAAAA *

Text row number 12 * BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB *

OK

Set command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

Read command reports the currently selected parameters in the format:

```
#FTPCFG: <tout>,<IPpignoring>,<FTPSEn>
```

Test command reports the supported range of values for all parameters.

Syntax

Command	Command type
AT#FTPCFG=<tout>,<IPPIgnoring>[,<FTPSEn>[,FTPSEndSize]]	Set
AT#FTPCFG?	Read
AT#FTPCFG=?	Test

Parameters and Values

Time-out in 100 ms units.

Hundreds of ms. **Default: 100.**

No IP Private ignoring. During a FTP passive mode, connection client uses the IP address received from server, even if it is a private IPV4 address.

IP Private ignoring enabled. During a FTP passive mode connection, if the server sends a private IPV4 address the client doesn't consider this and connects with server using the IP address used in AT#FTPOPEN.

1

Disable FTPS security: all FTP commands will perform plain FTP connections.

0

1

Enable FTPS security. From now on, any FTP session opened through FTP commands will be compliant to FTPS protocol, providing authentication and encrypted communication.

<FTPSendSize>	The TCP/IP stack uses send size for sending data. It takes effect on send size when FTP upload in online mode is running. Send is not called until <FTPSendSize> bytes are reached unless internal transmission timer (5 sec) expires.
0	Automatically selects default value. Default: 300.
1-1500	Send size in bytes.

Note: Read command doesn't show this parameter until it is set. Once set, the read command includes it in the response if it later not included in set command.

Notes

- During an active FTP mode connection, <IPPignoring> has no effect.
- Parameter is not saved in non-volatile memory.
- In FTPS mode, FTP command response time is generally longer than in normal FTP mode. This latency is mainly due to the SSL handshake that has to be done when FTP session is opened (#FTPOPEN) and whenever a data exchange is required (#FTPPUT, #FTPGET etcetera).
- If an SSL socket has been activated by means of #SSLD or #SSLFASTD, you cannot enable FTP security. Trying to dial an SSL socket when <enable>=1 raises an error.
- Any <enable> change is forbidden during an open FTP connection (with or without security). SSL configuration settings are forbidden during FTPS connections

Single Socket AT Commands

Socket Parameters Reset #SKTRST

Execute command resets the actual socket parameters in the device's non-volatile memory to the default ones.

The socket parameters to reset are:

- User ID
- Password
- Packet Size
- Socket Inactivity Time-Out
- Data Sending Time-Out
- Socket Type
- Remote Port
- Remote Address
- TCP Connection Time-Out

Test command returns the OK result code.

Syntax

Command	Command type
AT#SKTRST	Execute
AT#SKTRST=?	Test

Notes

- If PDP context is active, execute command returns an error. See AT#SGACT.
- User ID and password are not affected by this command. They are not set to default values; they keep the previous value.

Example

```
AT#SKTRST
```

```
OK
```

Socket parameters have been reset.

Enhanced IP Stack Extension AT Commands

Query DNS #QDNS

Execute command executes a DNS query to resolve the host name into an IP address.

Test command returns the OK result code.

Syntax

Command	Command type
AT#QDNS=[<host name>]	Execute
AT#QDNS=?	Test

Parameters and Values

<host name> String type, host name.
If the DNS query is successful, the IP address is reported in the result code, as follows:

#QDNS: <host name>,<IP address>

where:

<host name> - string type.

<IP address> - string type, in the format "xxx.xxx.xxx.xxx".

Notes

- The command has to activate the GPRS context if it was not previously activated. In this case, the context is deactivated after the DNS query. It also works with GSM context, but the GSM context has to be activated before.
- Requires correct settings for authentication parameters and that the GPRS network is present.
- This command requires that the authentication parameters are correctly set and that the GPRS network is present (or GSM, if GSM context is used).
- This command is available only on the first virtual port of CMUX and works on the PDP context 1 and on the first ConnId (see AT#SCFG).

Example

```
AT#QDNS=google.com
```

```
#QDNS: "google.com", "74.125.227.100"
```

```
OK
```

DNS Response Caching #CACHEDNS

Set command enables caching a mapping of domain names to IP addresses, as does a resolver library.

Read command reports whether the DNS Response Caching is currently enabled or not, in the format:

#CACHEDNS: <mode>

Test command returns the currently cached mapping along with the range of available values for parameter <mode>, in the format:

```
#CACHEDNS: [<hostn1>,<IPaddr1>,[...,<hostnn>,<IPaddrn>,]]](0,1)
```

where:

<hostnn> Hostname, string type.
<IPaddrn> IP address, string type, in the format "xxx.xxx.xxx.xxx".

Syntax

Command	Command type
AT#CACHEDNS=<mode>]	Set
AT#CACHEDNS?	Read
AT#CACHEDNS=?	Test

Parameters and Values

<mode>
0 Caching disabled or clear current cache.
1 Caching enabled.

Notes

- The validity period of each cached entry—that is, how long a DNS response remains valid—is determined by a value called the Time To Live (TTL), set by the administrator of the DNS server handing out the response.
- If the cache is full (8 elements) and a new IP address is resolved, an element is deleted from the cache. The deleted element is the one not used for the longest time.
- It is recommended that you clean the cache, if command +CCLK is issued while the DNS Response Caching was enabled.

Example

```
AT#CACHEDNS=1
OK
AT#QDNS=google.com
#QDNS: "google.com", "74.125.227.2"
OK
AT#QDNS=Yahoo.com
#QDNS: "Yahoo.com", "98.139.183.24"
OK
AT#CACHEDNS=?
#CACHEDNS: ( "google.com", "74.125.227.2" ), ( "Yahoo.com", "98.139.183.24" ), ( 0, 1 )
OK
```

Manual DNS Selection #DNS

Set command allows manual setting of primary and secondary DNS servers either for a PDP context defined by +CGDCONT or for a GSM context defined by #GSMCONT.

Read command returns the manual DNS servers set for every defined PDP context and for the single GSM context (only if defined), in the format:

```
[#DNS: <cid>,<primary>,<secondary>][<CR><LF>
```

```
#DNS: <cid>,<primary>,<secondary>]]
```

Test command reports the supported range of values for the <cid> only, in the format:

```
#DNS: (0,5),,
```

Syntax

Command	Command type
AT#DNS=<cid>,<primary>,<secondary>	Set
AT#DNS?	Read
AT#DNS=?	Test

Parameters and Values

<cid>	Context identifier.
0	Specifies GSM context.
1	Numeric parameter that specifies a particular PDP context definition.
<primary>	String type, manual primary DNS server, in the format "xxx.xxx.xxx.xxx" used for the specified cid. Use this value instead of the primary DNS server from the network. Default: "0.0.0.0" .
<secondary>	String type, manual secondary DNS server, in the format "xxx.xxx.xxx.xxx" used for the specified cid. Use this value instead of the secondary DNS server from the network. Default: "0.0.0.0" .

Notes

- If <primary> is "0.0.0.0" and <secondary> is not "0.0.0.0", then issuing AT#DNS=... raises an error.
- If <primary> is "0.0.0.0" you are using the primary DNS server from the network as consequence of a context activation.
- If <primary> is not "0.0.0.0" and <secondary> is "0.0.0.0", then only the manual primary DNS server is used.
- If the context identified by <cid> has not been defined elsewhere, issuing AT#DNS= causes an error.
- If the context identified by <cid> has not been activated, issuing AT#DNS= causes an error.

DNS from Network #NWDNS

Execute command returns either the primary and secondary DNS addresses for the GSM context (if specified) and/or a list of primary and secondary DNS addresses for the specified PDP context identifiers

Test command returns a list of defined <cid>s.

Syntax

Command	Command type
AT#NWDNS=[<cid>[,<cid>[,...]]]	Set
AT#NWDNS=?	Test

Parameters and Values

<cid>	Context identifier.
0	Specifies the GSM context. See +GSMCONT.
1-5	Numeric parameter that specifies a particular PDP context definition. See +CGDCONT. The command returns only one row of information for every specified <cid>, even if the same <cid> is present more than once.

The command returns a row of information for every specified <cid> whose context has been already defined. No row is returned for a <cid> whose context has not been defined yet. Response format is:

```
#NWDNS: <cid>,<PDNSAddress>,<SDNSAddress>[<CR><LF>
#NWDNS: <cid>,<PDNSAddress>,<SDNSAddress> [...]]
```

where:

<cid> - context identifier, as before

<PDNSAddress>,<SDNSAddress> - primary and secondary DNS addresses set through AT#DNS command. If not set, they are the primary and secondary DNS addresses assigned during the PDP(or GSM) context activation.

Notes

- If no <cid> is specified, the DNS addresses for all defined contexts are returned.
- Issuing the command with more than six parameters raises an error.

GPRS Context Activation #GPRS

Execute command deactivates or activates the PDP context #1. Eventually the authentication proceeds by using the parameters given with #PASSW and #USERID.

Read command reports the current status of the PDP context #1, in the format:

```
#GPRS: <status>
```

where:

<status>	
0	PDP context #1 deactivated.
1	PDP context #1 activated.
2	PDP context #1 activation pending.

Test command returns the allowed values for parameter <mode>.

Syntax

Command	Command type
AT#GPRS=[<mode>]	Execute
AT#GPRS?	Read
AT#GPRS=?	Test

Parameters and Values

<mode>	PDP context activation mode.
0	PDP context #1 deactivation request.
1	PDP context #1 activation request.
	If the PDP context #1 is activated, the result code OK is preceded by the intermediate result code: +IP: <ip_address_obtained> reporting the local IP address obtained from the network.

Notes

- It is recommended you use the same command—for example #GPRS—to activate the context, deactivate it and interrogate its status.
- You must associate at least a socket identifier with PDP context #1 so that every #GPRS action can be effective. By default, the PDP context #1 is associated with socket identifiers 1, 2, and 3, but it is possible to modify these associations through #SCFG. Trying to issue a #GPRS action when no socket identifier is associated with PDP context #1 raises an error.
- This command is not allowed if GSM context is activated. See AT#SGACT=0,1.
- If the PDP context #1 is activated issuing AT#GPRS=1, then if you request to deactivate the PDP context #1 during a call issuing AT#GPRS=0 and then, after the call termination, you want to activate the PDP context #1 again through #GPRS, you need to issue the following sequence of three commands

```
AT#GPRS=1
OK
AT#GPRS=0
OK
AT#GPRS=1
OK
```

Examples

PDP Context #1 is activated, IP is 129.137.1.1

```
AT#GPRS=1
+IP: 129.137.1.1
OK
```

Now PDP Context #1 is deactivated, IP is lost.

```
AT#GPRS=0
OK
```

Socket Listen Ring Indicator #E2SLRI

Set command enables or disables the Ring Indicator pin response to a Socket Listen connect and, if enabled, the duration of the negative going pulse generated on receipt of connect.

Read command reports whether the Ring Indicator pin response to a Socket Listen connect is currently enabled or not, in the format:

```
#E2SLRI: <n>
```

Test command returns the allowed values for parameter <status>.

Syntax

Command	Command type
AT#E2SLRI=[<n>]	Set
AT#E2SLRI?	Read
AT#E2SLRI=?	Test

Parameters and Values

<n>	Enable or disable RI.
0	RI disabled for Socket Listen connect. Default: 0.
50-1150	RI enabled for Socket Listen connect; a negative going pulse is generated on receipt of connect and <n> is the duration in ms of this pulse.

Firewall Setup #FRWL

Execute command controls the internal firewall settings.

Read command reports the list of all ACCEPT chain rules registered in the Firewall settings in the format:

```
#FRWL: <ip_addr>,<net_mask>
```

```
#FRWL: <ip_addr>,<net_mask>
```

```
....
```

```
OK
```

Test command returns the allowed values for parameter <action>.

Syntax

Command	Command type
AT#FRWL=[<action>,<ip_address>,<net mask>]	Execute
AT#FRWL?	Read
AT#FRWL=?	Test

Parameters and Values

<action>	Command action.
0	Remove selected chain.
1	Add an ACCEPT chain.
2	Remove all chains (DROP everything). <ip_addr> and <net_mask> have no meaning in this case.
<ip_addr>	String type, remote address to be added into the ACCEPT chain. Can be any valid IP address in the format: xxx.xxx.xxx.xxx.
<net_mask>	String type, mask to be applied on the <ip_addr>. Can be any valid IP address mask in the format: xxx.xxx.xxx.xxx.
	Command returns OK result code if successful.

Note: The firewall applies for incoming (listening) connections only.

Firewall general policy is DROP, therefore all packets that are not included into an ACCEPT chain rule is silently discarded.

When a packet comes from the IP address incoming_IP, the firewall chain rules are scanned for matching with the following criteria:

$\text{incoming_IP} \& \text{<net_mask>} = \text{<ip_addr>} \& \text{<net_mask>}$

If criteria is matched, then the packet is accepted and the rule scan is finished. If criteria is not matched for any chain, the packet is silently dropped.

Notes

- For outgoing connections made with #SD the remote host is dynamically inserted into the ACCEPT chain for the entire connection duration. Therefore, the #FRWL command is used only for defining the #SL behavior, deciding which hosts are allowed to connect to the local device.
- Rules are not saved in non-volatile memory. At startup the rules list is empty.
- Issue this command before establishing a data connection using the AT#SGACT command.

Example

To accept connections only from devices that are on the IP addresses ranging from 197.158.1.1 to 197.158.255.255, add the following chain to the firewall:

```
AT#FRWL=1,"197.158.1.1","255.255.0.0"
```

OK

Data Volume #GDATAVOL

Execute command reports, for every active PDP context, the amount of data the last GPRS session (and the last GSM session, if GSM context is active) received and transmitted, or it will report the total amount of data received and transmitted during all past GPRS (and GSM) sessions, since last reset

Test command returns the range of supported values for parameter <mode>.

Syntax

Command	Command type
AT#GDATAVOL=<mode>]	Execute
AT#GDATAVOL=?	Test

Parameters and Values

<mode>

0 Resets the GPRS data counter for the all the available PDP contexts (1-5) and GSM data counter for GSM context 0.

1 Reports the last GPRS data session counter for the set PDP contexts, (for example all the PDP contexts with APN parameter set using +CGDCONT and the last GSM session data counter for the GSM context, if set through #GSMCONT), in the format:

```
#GDATAVOL: <cidn>,<totn>,<sentn>,<receivedn>[<CR><LF>
```

```
#GDATAVOL: <cidm>,<totm>,<sentm>,<receivedm>[...]]
```

where:

<cidn> - PDP context identifier.

0 - specifies the GSM context

1-5 - numeric parameter which specifies a particular PDP context definition

<totn> - Number of bytes either received or transmitted in the last data session for the <cidn> PDP context.

<sentn> - Number of bytes transmitted in the last data session for the <cidn> PDP context.

<receivedn> - Number of bytes received in the last data session for the <cidn> PDP context.

2 Reports the total GPRS data counter, since last reset, for the all the set PDP contexts (for example all the PDP context with APN parameter set using +CGDCONT) and the total GSM data counter for the GSM context (if set through #GSMCONT) in the format:

```
#GDATAVOL: <cidn>,<totn>,<sentn>,<receivedn>[<CR><LF>
```

```
#GDATAVOL: <cidm>,<totm>,<sentm>,<receivedm>[...]]
```

where:

<cidn> - PDP context identifier

0 - Specifies the GSM context.

1-5 - numeric parameter, which specifies a particular PDP context definition.

<totn> - number of bytes either received or transmitted, in every GPRS (or GSM) session since last reset, for <cidn> PDP context.

<sentn> - number of bytes transmitted, in every GPRS (or GSM) session since last reset, for <cidn> PDP context.

<receivedn> - number of bytes received, in every GPRS (or GSM) session since last reset, for <cidn> PDP context.

Notes

- Last data session counters are not saved in non-volatile memory so they are lost at power off.

Example

Example showing two PDP contexts being defined and therefore two displays of GDATAVOL

```
AT+CGDCONT=?
```

```
+CGDCONT: (1-5),"IP",,,(0,1),(0,1)
```

```
+CGDCONT: (1-5),"IPV6",,,(0,1),(0,1)
```



```
at#gdatavol=1
#GDATAVOL: 1,0,0,0
#GDATAVOL: 2,0,0,0
OK
AT#PING="www.google.com"
#PING: 01,"74.125.129.106",13,45
#PING: 02,"74.125.129.106",6,45
#PING: 03,"74.125.129.106",5,45
#PING: 04,"74.125.129.106",5,45
OK
AT#GDATAVOL=1
#GDATAVOL: 1,696,300,396
#GDATAVOL: 2,0,0,0
```

```
Remove CGDCONT 2
AT+CGDCONT=2
OK
AT+CGDCONT?
+CGDCONT: 1,"IP","wap.voicestream.com","",0,0
OK
AT#GDATAVOL=1
#GDATAVOL: 1,696,300,396
OK
```

ICMP Ping Support #ICMP

Set command enables or disables the ICMP ping support.

Read command returns whether the ICMP ping support is currently enabled or not, in the format:

#ICMP: <mode>

Test command reports the supported range of values for the <mode> parameter.

Syntax

Command	Command type
AT#ICMP=<mode>	Set
AT#ICMP?	Read
AT#ICMP=?	Test

Parameters and Values

<mode>

- 0** Disable ICMP ping support. **Default: 0.**
- 1** Enable firewalled ICMP ping support. The module is sending a proper ECHO_REPLY only to a subset of IP Addresses pinging it. The #FRWL specifies is subset of IP addresses.
- 2** Enable free ICMP ping support. The module is sending a proper ECHO_REPLY to every IP address pinging it.

Maximum TCP Payload Size #TCPMAXDAT

Set command allows you to set the maximum TCP payload size in TCP header options.

Read command reports the current maximum TCP payload, in the format:

#TCPMAXDAT: <size>

Test command reports the supported range of values for the <size> parameter.

Syntax

Command	Command type
AT#TCPMAXDAT=<size>	Set
AT#TCPMAXDAT?	Read
AT#TCPMAXDAT=?	Test

Parameters and Values

<size>

Maximum TCP payload size accepted in one single TCP/IP datagram; it is sent in TCP header options in SYN packet.

- 0** The maximum TCP payload size is handled automatically by module. **Default: 0.**
- 496-1420** Maximum TCP payload size

TCP Reassembly #TCPREASS

Set command enables the TCP reassembly feature, in order to handle fragmented TCP packets.

Read command returns whether the TCP reassembly feature is enabled or not, in the format:

#TCPREASS: <n>

Test command reports the supported range of values for the parameter <n>.

Syntax

Command	Command type
AT#TCPREASS=<size>	Set
AT#TCPREASS?	Read
AT#TCPREASS=?	Test

Parameters and Values

<n>	
0	Disable TCP reassembly feature. Default: 0.
1	Enable TCP reassembly feature.

PING Request #PING

Use this command to send ping echo request messages and to receive the corresponding echo reply.

Test command reports the supported range of values for the #PING command.

Syntax

Command	Command type
AT#PING=<IPAddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>]]]]	Execute
AT#PING=?	Test

Parameters and Values

<IPAddr>	String type. Address of the remote host. This parameter can be either: <ul style="list-style-type: none"> Any valid IP address in the format: "xxx.xxx.xxx.xxx". Any host name to be solved with a DNS query.
<retryNum>	The number of ping echo request to send. Range is 1-64. Default: 4.
<len>	The length of ping echo request message. Range is 32-1460. Default: 32.
<timeout>	The timeout, in 100 ms units, waiting a single echo reply. Range is 1-600. Default: 50.
<ttl>	Time to live. Range is 1-255. Default: 128.

Once the single echo reply message is received, a string like the following is displayed:

```
#PING: <replyId>,<Ip Address>,<replyTime>,<ttl>
```

where:

<replyId>	Echo reply number.
<IP Address>	IP address of the remote host
<replyTime>	Time, in 100 ms units, required to receive the response.
<ttl>	Time to live of the echo reply message.

Notes

- Multi-Tech recommends increasing the default timeout value to allow the cellular network to respond.
- When the echo request timeout expires (no reply received on time), the response contains <replyTime> set to 600 and <ttl> set to 255.
- To receive the corresponding echo reply is not required to enable separately AT#ICMP.
- Before send PING request, the CDMA context must have been activated by AT#SGACT.

Example

```
AT#PING=google.com,4,32,600,128
#PING: 00,"74.125.227.99",147,54
#PING: 01,"74.125.227.99",152,54
#PING: 02,"74.125.227.99",296,54
#PING: 03,"74.125.227.99",163,54
OK
```

Command issued without all parameters.

```
AT#PING=google.com
#PING: 01,"173.194.33.5",14,53
#PING: 02,"173.194.33.5",8,53
#PING: 03,"173.194.33.5",5,53
#PING: 04,"173.194.33.5",5,53
```

E-mail Management AT Commands

E-mail SMTP Server #ESMTP

Set command sets the SMTP server address, used to send e-mails. SMTP server can be specified as IP address or as a nickname.

Read command reports the current SMTP server address, in the format:

#ESMTP: <smtp>

Test command returns the maximum length of <smtp>.

Syntax

Command	Command type
AT#ESMTP=[<smtp>]	Set
AT#ESMTP?	Read
AT#ESMTP=?	Test

Parameters and Values

<smtp>

String type, server address. This parameter can be either:

Valid IP address in the format: xxx.xxx.xxx.xxx.

Host name to be solved with a DNS query in the format: <host name>

Default: empty string "".

Notes

- The SMTP server is used inside the APN space (the smtp server provided by the network operator) or it must allow the Relay, otherwise it refuses to send e-mail.

Example

```
AT#ESMTP="smtp.mydomain.com"
```

OK

E-mail Sender Address #EADDR

Set command sets the sender address string used for sending e-mail.

Read command reports the current sender address, in the format:

#EADDR: <e-addr>

Test command returns the maximum allowed length of the string parameter <e-addr>.

Syntax

Command	Command type
AT#EADDR=[<e-add>]	Set
AT#EADDR?	Read
AT#EADDR=?	Test

Parameters and Values

<e-add> String type, sender address. Any string value up to the maximum length of 80.
Default: empty string "".

Example

```
AT#EADDR="me@email.box.com"
OK
AT#EADDR?
#EADDR: "me@email.box.com"
OK
```

E-mail Authentication User Name #EUSER

Set command sets the user identification string used during the authentication step of the SMTP.

Read command reports the current user identification string, in the format:

#EUSER: <e-user>

Test command returns the maximum allowed length of <e-user>.

Syntax

Command	Command type
AT#EUSER=[<e-user>]	Set
AT#EUSER?	Read
AT#EUSER=?	Test

Parameters and Values

<e-user> String type, e-mail authentication User ID.
 Any string value up to the maximum length reported by the test command.
Default: empty string "".

Note: If no authentication is required then the <e-user> parameter is empty "".

Notes

- This is a different user field than the one used for authentication.

Example

```
AT#EUSER="myE-Name "
```

```
OK
```

```
AT#EUSER?
```

```
#EUSER: "myE-Name "
```

```
OK
```

E-mail Authentication Password #EPASSW

Set command sets the password string used during the authentication step of the SMTP.

Test command returns the maximum allowed length of the string parameter <e-pwd>.

Syntax

Command	Command type
AT#EPASSW=[<e-pwd>]	Set
AT#EPASSW=?	Test

Parameters and Values

<e-pwd>

String type, e-mail authentication password.

Any string value up to the maximum length reported in the Test Command.

Default: empty string "".

Note: If no authentication is required then the <e-pwd> parameter is empty "".

Notes

- This is a different password field than the one used for GPRS authentication. See #PASSW.

Example

```
AT#EPASSW="myPassword"
```

```
OK
```

E-mail Sending with GPRS Context Activation #SEMAIL

Execute command sends an e-mail message. If not previously activated by #EMAILACT, activates a GPRS context. The GPRS context activated by #SEMAIL is deactivated when the e-mail is sent.

Test command returns the OK result code.

Syntax

Command	Command type
AT#SEMAIL=[<da>,<subj>]	Execute
AT#SEMAIL=?	Test

Parameters and Values

<da>	String type, destination address. Maximum length 100 characters.
<subj>	String type, subject of message. Maximum length 100 characters.
	The device responds to the command with the prompt '>' and waits for the message body text.
	To complete the operation send Ctrl-Z char (0x1A hex). To exit without writing the message send ESC char (0x1B hex).
	If e-mail message is successfully sent, the response is OK.
	If message sending fails for some reason, an error code is reported.

Notes

- If the length of one parameter exceeds the maximum length, the string is truncated.
- Ensure that no other commands are issued during command execution.
- To avoid malfunctions, wait for the OK or ERROR / +CMS ERROR:<err> response before issuing further commands.
- The message body maximum length is 1024 bytes. Trying to send more data causes the surplus to be discarded and lost.
- This command is not allowed if GSM context is active (see AT#SGACT=0,1).

Example

```
AT#SEMAIL="me@myaddress.com","subject of the mail"
```

```
>message body... this is the text of the mail message...
```

```
CTRL-Z
```

```
..wait..
```

```
OK
```

```
Message has been sent.
```

E-mail GPRS Context Activation #EMAILACT

Execute command deactivates and activates the PDP context #1, eventually proceeding with authentication.

Read command reports the current status of the GPRS context for the e-mail, in the format:

```
#EMAILACT: <status>
```

where:

<status>	
0	GPRS context deactivated.
1	GPRS context activated.

Test command returns the OK result code.

Syntax

Command	Command type
AT#EMAILACT=[<mode>]	Execute
AT#EMAILACT=?	Test

Parameters and Values

<mode>	GPRS context activation mode.
0	GPRS context deactivation request.
1	GPRS context activation request.

Note

- At least one socket identifier needs to be associated with PDP context #1 in order to every #EMAILACT action be effective. By default, the PDP context #1 is associated with socket identifiers 1, 2, and 3, but it is possible to modify these associations through #SCFG. Trying to issue a #EMAILACT action when no socket identifier is associated with PDP context #1 raises an error.
- This command is not allowed if GSM context is active (see AT#SGACT=0,1).
- It is strongly recommended to use the same command (#EMAILACT) to activate the context, deactivate it, and interrogate about its status.
- If the PDP context #1 has been activated issuing AT#EMAILACT=1, then:

- If you request to deactivate the PDP context #1 issuing AT#GPRS=0 DTE receives the final result code OK but nothing really happens
- If you request to deactivate the PDP context #1 during a call issuing AT#EMAILACT=0 and then, after the call termination, you want to activate the PDP context #1 again through #EMAILACT, you need to issue the following sequence of three commands:

AT#EMAILACT=1

OK

AT#EMAILACT=0

OK

AT#EMAILACT=1

OK

(Analogous considerations if you want to request the activation of PDP context #1 issuing AT#GPRS=1, see #GPRS.)

Example

AT#EMAILACT=1

OK

GPRS context has been activated.

AT#EMAILACT=0

OK

GPRS context has been deactivated.

E-mail Sending #EMAILD

Execute command sends an e-mail message if GPRS context has already been activated by either AT#SGACT=1,1 or AT#EMAILACT=1 or AT#GPRS=1.

It is also possible to send an e-mail on the GSM context, if it has already been activated by AT#SGACT=0,1.

Test command returns the OK result code.

Syntax

Command	Command type
AT#EMAILD=[<da>[,<subj>]]	Execute
AT#EMAILD=?	Test

Parameters and Values

<da>	String type, destination address. Maximum length 100 characters.
<subj>	String type, subject of message. Maximum length 100 characters.
	The device responds to the command with the prompt '>' and waits for the message body text.
	To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex)
	If e-mail message is successfully sent, then the response is OK.
	If message sending fails for some reason, an error code is reported.

Notes

- If the length of one of the string type parameters exceeds the maximum length, then the string is truncated.
- Care must be taken to ensure that during the command execution, no other commands are issued.
- To avoid malfunctions is suggested to wait for the OK or ERROR / +CMS ERROR:<err> response before issuing further commands.
- Maximum length for message body is 1024 bytes for versions to 7.03.02/7.02.07 and from 10.0x.xx0 to 10.0x.xx2, 1500 bytes for versions starting from 10.0x.xx3, trying to send more data will cause the surplus to be discarded and lost.
- The only difference between this command (set using GPRS context) and the #SEMAIL is that this command does not interact with the GPRS context status, leaving it ON or OFF according to the #EMAILACT (#SGACT) setting, thus, when the connection made with #EMAILD is closed, the context status is maintained.

Example

```
AT#EMAILD="me@myaddress.com","subject of the mail"
```

```
>message body... this is the text of the mail message...
```

```
CTRL-Z
```

```
..wait..
```

```
OK
```

```
Message has been sent.
```

E-mail Parameters Save #ESAV

Execute command stores the e-mail parameters in the device's non-volatile memory. Parameters stored are:

- E-mail user name
- E-mail password
- E-mail sender address
- E-mail SMTP server

Test command returns the OK result code.

Syntax

Command	Command type
AT#ESAV	Execute
AT#ESAV=?	Test

Notes

- If some parameters are not previously specified a default value is used.

E-mail Parameters Reset #ERST

Execute command resets the e-mail parameters to the "Default" configuration and stores them in the non-volatile memory of the device. Parameters reset are:

- E-mail User Name
- E-mail Password
- E-mail Sender Address
- E-mail SMTP server

Test command returns the OK result code.

Syntax

Command	Command type
AT#ERST	Execute
AT#ERST=?	Test

SMTP Read Message #EMAILMSG

Execute command returns the last response from SMTP server.

Test command returns the OK result code.

Syntax

Command	Command type
AT#EMAILMSG	Execute
AT#EMAILMSG=?	Test

Send Mail with Attachment #SMTPCL

This command permits to send an email with different types of attachments if GPRS context has already been activated. See #SGACT or #GPRS.

After sending message body text (as with #EMAILD), the command switches to online mode if attachment must be sent.

While in online mode, data received on the serial port is transmitted on the SMTP socket as MIME attachment.

The escape sequence must be sent to close the SMTP connection.

Encoding of data received on the serial port is performed if required (binary data), before transmission on the SMTP socket.

Test command reports the supported range of values for <da>,<subj>,<att>[,<filename>,<encod>].

Syntax

Command	Command type
AT#SMTPCL=<da>,<subj>,<att>[,<filename>,<encod>]	
AT#SMTPCL=?	Test

Parameters and Values

<da>	String type, destination address. Maximum length 100 characters.
<subj>	String type, subject of message. Maximum length 100 characters.
<att>	Attached file flag.
0	No attachment.
1	Attach a txt file.
2	Attach a binary file, for example jpg, bin, or pdf.
<filename>	Attached file name. Maximum length 50 characters.
<encod>	Content-Transfer-Encoding used for attachment.
0	"7bit" means data all represented as short lines of US-ASCII data.
1	"base64" designed to represent arbitrary sequences of octets in a form that need not be humanly readable.
	Note: If no attachment (<att> 0) has to be sent, the behavior is the same as with #EMAILD.
	OK after CTRL-Z is returned (if connection was successful), the switch to online mode is not performed.

Notes

- If a txt file (<att>=1) is attached, only <encod>0 ("7bit") is possible. If a binary file (<att>=2) is attached, only <encod>1 ("base64") is possible.
- If <att>=0 and <filename> is present and not empty, the attachment is not considered.
- If <att> 1 or 2 and <filename> is not present, command returns an ERROR.

Examples

```
at#smtpcl="me@myaddress.com","test1",1,"sample.txt",0
>message body...this is the text of the mail message...
```

Send CTRL-Z
CONNECT
...data received on the serial port is sent as attachment....

Send escape sequence to close the SMTP connection

```
+++
NO CARRIER
at#smtpcl="me@myaddress.com","test2",2,"image.jpg",1
>message body...this is the text of the mail message...
```

Send CTRL-Z
CONNECT
...data received on the serial port is base64-encoded and sent as attachment....

Send escape sequence to close the SMTP connection

```
+++
NO CARRIER
```

Calculate and Update Date and Time #NTP

Execute command calculates and updates date and time through NTP protocol (RFC2030), sending a request to a NTP server.

Test command reports the supported range of values for all parameters.

Syntax

Command	Command type
AT#NTP=<NTPaddr>,<NTPPort>,<update_module_clock>,<timeout>	Execute
AT#NTP=?	Test

Parameters and Values

- <NTPaddr>

Address of the NTP server, string type. This parameter can be either:
Any valid IP address in the format: "xxx.xxx.xxx.xxx".
Or
Any host name to be solved with a DNS query.
- <NTPPort>

NTP server port to contact

1-65535

<update_module_clock>**0**

No update module clock.

1

Update module clock.

<timeout>

Waiting timeout for server response in seconds.

1-10**Examples**

```
at#ntp="ntp1.inrim.it",123,1,2
```

```
#NTP: 12/01/27,14:42:38
```

```
OK
```

```
...
```

```
at+cclk?
```

```
+CCLK: "12/01/27,14:42:39+00"
```

```
OK
```

Easy Scan® Extension AT Commands

Note: Issue Easy Scan® Extension AT commands with no SIM inserted to avoid a conflict with normal operations, such as incoming calls, periodic location update, or periodic routing area update.

Network Survey #CSURV

Execute command surveys band channels from channel <s> to channel <e>. If parameters are omitted, AT#CSURV<CR>, the command performs a full band scan.

Syntax

Command	Command type
AT#CSURV[=<s>,<e>]]	Execute

Parameters and Values

<s>	Starting channel.
<e>	Ending channel.

After issuing the command, the device responds with:

Network survey started...

Information of each received carrier follows, in the format:

For BCCH-Carrier:

```
arfcn: <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId>
cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[ <arfcn64>]] [numChannels: <numChannels>
array: [<ba1> ..[<ba32>]] [pbcc: <pbcc> [nom: <nom> rac: <rac> spgc: <spgc> pat: <pat> nco: <nco> t3168:
<t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh:
<pcMeasCh>]]] <CR><LF><CR><LF><CR><LF>
```

where:

<arfcn>	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel).
<bsic>	Base station identification code. If #CSURVF last setting is 0, <bsic> is a decimal number, otherwise it is a 2-digit octal number.
<rxLev>	Reception level (in dBm), decimal number.
<ber>	Bit error rate (in %), decimal number.
<mcc>	Mobile country code, hexadecimal 3-digit number.
<mnc>	Mobile network code, hexadecimal 2-digit number.
<lac>	Location area code. If #CSURVF last setting is 0, <lac> is a decimal number, otherwise it is a 4-digit hexadecimal number.
<cellId>	Cell identifier. If #CSURVF last setting is 0, <cellId> is a decimal number, otherwise it is a 4-digit hexadecimal number.
<cellStatus>	Cell status, string type.
CELL_SUITABLE	C0 is a suitable cell.
CELL_LOW_PRIORITY	The cell is low priority based on the received system information.
CELL_FORBIDDEN	The cell is forbidden.

CELL_BARRED	The cell is barred based on the received system information.
CELL_LOW_LEVEL	The cell <rxLev> is low.
CELL_OTHER	None of the above e.g. exclusion timer running, no BCCH available...etc.
<numArfcn>	The number of valid channels in the Cell Channel Description, decimal number.
<arfcnn>	The arfcn of a valid channel in the Cell Channel Description (n is in the range 1..<numArfcn>). A decimal number.
<numChannels>	The number of valid channels in the BCCH Allocation list. A decimal number. The output of this information for non-serving cells depends on last #CSURVEXT setting: If #CSURVEXT=0 this information is displayed only for serving cell. If #CSURVEXT=1 or 2 this information is displayed also for every valid scanned BCCH carrier.
<ban>	The arfcn of a valid channel in the BA list (n is in the range 1..<numChannels>), decimal number. The output of this information for non-serving cells depends on last #CSURVEXT setting: If #CSURVEXT=0 this information is displayed only for serving cell. If #CSURVEXT=1 or 2 this information is displayed also for every valid scanned BCCH carrier.
The following information appears only if GPRS is supported in the cell:	
<pbccch>	Packet broadcast control channel.
0	pbccch not activated on the cell.
1	pbccch activated on the cell.
<nom>	Network operation mode.
1	
2	
3	
<rac>	Routing area code.
0..255	
<spgc>	SPLIT_PG_CYCLE support
0	SPLIT_PG_CYCLE is not supported on CCCH on this cell
1	SPLIT_PG_CYCLE is supported on CCCH on this cell
<pat>	Priority access threshold.
0	
3..6	
<nco>	Network control order.
0..2	
<t3168>	Timer 3168
<t3192>	Timer 3192
<drxmax>	Discontinuous reception max time (in seconds).
<ctrlAck>	Packed control ack.
<bsCVmax>	Blocked sequence countdown max value.
<alpha>	Power control alpha parameter.
<pcMeasCh>	Channel type used for power control downlink measurements.
0	BCCH
1	PDCH

For non-BCCH-Carrier:

arfcn: <arfcn> rxLev: <rxLev>

where:

<arfcn> The RF channel, decimal number.
<rxLev> Reception level (in dBm), decimal number.

The #CSURV output ends in two ways, depending on the last #CSURVF setting:

If #CSURVF=0 or #CSURVF=1, the output ends with the string:

Network survey ended

If #CSURVF=2, the output ends with the string:

Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

where:

<NoARFCN> Number of scanned frequencies.
<NoBCCH> Number of found BCCH.

Notes

- The command is executed within two minutes maximum.

Examples

AT#CSURV

Network survey started...

```
arfcn: 48 bsc: 24 rxLev: -52 ber: 0.00 mcc: 610 mnc: 1 lac: 33281 cellId: 3648
cellStatus:CELL_SUITABLE numArfcn: 2 arfcn: 30 48 numChannels: 5 array: 14 19
22 48 82 arfcn: 14 rxLev: 8
```

Network survey ended

OK

Network Survey (Numeric Format) #CSURVC

Execute command surveys band channels from channel <s> to channel <e>. Issuing AT#CSURVC<CR> performs a full band scan.

Syntax

Command	Command type
AT#CSURVC[=<s>,<e>]]	Execute

Parameters and Values

<s> Starting channel.
<e> Ending channel.

After issuing the command, the device responds with:

Network survey started...

Information of each received carrier follows, in the format:

For BCCH-Carrier:

```
<arfcn>,<bsic>,<rxLev>,<ber>,<mcc>,<mnc>,<lac>,<cellId>,<cellStatus>,<numArfcn>[,<arfcn1> ..[<arfcn64>]]
[,<numChannels>[,<ba1> ..[<ba32>]]][,<pbccch> [,<nom>,<rac>,<spgc>,<pat>,<nco>,<t3168>,<t3192>,<drxmax>,<ctrlAck>,<bsCVmax>,<alpha>,<pcMeasCh>]]] <CR><LF><CR><LF><CR><LF>
```

where:

<arfcn>	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel).
<bsic>	Base station identification code. If #CSURVF last setting is 0, <bsic> is a decimal number, otherwise it is a 2-digit octal number.
<rxLev>	Reception level (in dBm), decimal number.
<ber>	Bit error rate (in %), decimal number.
<mcc>	Mobile country code, hexadecimal 3-digit number.
<mnc>	Mobile network code, hexadecimal 2-digit number.
<lac>	Location area code. If #CSURVF last setting is 0, <lac> is a decimal number, otherwise it is a 4-digit hexadecimal number.
<cellId>	Cell identifier. If #CSURVF last setting is 0, <cellId> is a decimal number, otherwise it is a 4-digit hexadecimal number.
<cellStatus>	Cell status, string type.
CELL_SUITABLE	C0 is a suitable cell.
CELL_LOW_PRIORITY	The cell is low priority based on the received system information.
CELL_FORBIDDEN	The cell is forbidden.
CELL_BARRED	The cell is barred based on the received system information.
CELL_LOW_LEVEL	The cell <rxLev> is low.
CELL_OTHER	None of the above e.g. exclusion timer running, no BCCH available...etc.
<numArfcn>	The number of valid channels in the Cell Channel Description, decimal number.
<arfcn>	The arfcn of a valid channel in the Cell Channel Description (n is in the range 1..<numArfcn>). A decimal number.
<numChannels>	The number of valid channels in the BCCH Allocation list. A decimal number. The output of this information for non-serving cells depends on last #CSURVEXT setting: If #CSURVEXT=0 this information is displayed only for serving cell. If #CSURVEXT=1 or 2 this information is displayed also for every valid scanned BCCH carrier.
<ban>	The arfcn of a valid channel in the BA list (n is in the range 1..<numChannels>), decimal number. The output of this information for non-serving cells depends on last #CSURVEXT setting:

If #CSURVEXT=0 this information is displayed only for serving cell.
If #CSURVEXT=1 or 2 this information is displayed also for every valid scanned BCCH carrier.

The following information appears only if GPRS is supported in the cell:

<pbccch>	Packet broadcast control channel.
0	pbccch not activated on the cell.
1	pbccch activated on the cell.

<nom>	Network operation mode.
1	
2	
3	
<rac>	Routing area code.
0..255	
<spgc>	SPLIT_PG_CYCLE support
0	SPLIT_PG_CYCLE is not supported on CCCH on this cell
1	SPLIT_PG_CYCLE is supported on CCCH on this cell
<pat>	Priority access threshold.
0	
3..6	
<nco>	Network control order.
0..2	
<t3168>	Timer 3168
<t3192>	Timer 3192
<drxmax>	Discontinuous reception max time (in seconds).
<ctrlAck>	Packed control ack.
<bsCVmax>	Blocked sequence countdown max value.
<alpha>	Power control alpha parameter.
<pcMeasCh>	Channel type used for power control downlink measurements.
0	BCCH
1	PDCH

For non-BCCH-Carrier:

<arfcn> <rxLev>

where:

<arfcn>	The RF channel, decimal number.
<rxLev>	Reception level (in dBm), decimal number.

The last information from #CSURVC , depends on the last #CSURVF setting:

If #CSURVF=0 or #CSURVF=1, the output ends with the string:

Network survey ended

If #CSURVF=2, the output ends with the string:

Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

where:

<NoARFCN>	Number of scanned frequencies.
<NoBCCH>	Number of found BCCH.

Notes

- The command is executed within two minutes maximum.
- #CSURVC is the same information as #CSURV, but in numeric format only.

Examples

```
AT#CSURVC
```

```
Network survey started...
```

```
48,24,-52,0.00,610,1,33281,3648,0,2,30 48,5,14 19 22 48 82
```

```
14,8
```

```
Network survey ended
```

```
OK
```

Network Survey of User Defined Channels #CSURVU

Execute command surveys the given channels. The result format is like #CSURV.

Syntax

Command	Command type
AT#CSURVU=[<ch1>[,<ch2>[,...[,<chn>]]]]	Execute

Parameters and Values

<chn> Channel number (arfcn).

Notes

- The command is executed within two minutes maximum.

Examples

```
AT#CSURVU=59,110
```

```
Network survey started...
```

```
arfcn: 59 bsic: 16 rxLev: -76 ber: 0.00 mcc: 546 mnc: 1 lac: 54717 cellId: 21093 cellStatus:
```

```
CELL_SUITABLE numArfcn 2 arfcn: 36 59
```

```
arfcn: 110 rxLev: -107
```

```
Network survey ended
```

```
OK
```

Network Survey of User Defined Channels (Numeric Format) #CSURVUC

Execute command surveys the given channels. The result format is like #CSURVC.

Syntax

Command	Command type
AT#CSURVUC=[<ch1>[,<ch2>[,...[,<chn>]]]]	Execute

Parameters and Values

<chn> Channel number (arfcn).

Notes

- The command is executed within two minutes maximum.
- #CSURVUC is the same information as #CSURVU, but in numeric format only.

Examples

```
AT#CSURVUC=59,110
```

```
Network survey started...
```

```
59,16,-76,0.00,546,1,54717,21093,0,2,36 59
```

```
110,-107
```

```
Network survey ended
```

```
OK
```

BCCH Network Survey #CSURVB

Execute command surveys the network through M (maximum number of available frequencies depending on the last selected band) channels. The survey stops as soon as it finds <n> BCCH carriers. The result format is like command #CSURV.

Test command reports the value range for parameter <n> in the format:

```
(1-M)
```

where M is the maximum number of available frequencies depending on last selected band.

Syntax

Command	Command type
AT#CSURVB=[<n>]	Execute
AT#CSURVB=?	Test

Parameters and Values

<n> Number of desired BCCH carriers.

1..M

BCCH Network Survey (Numeric Format) #CSURVBC

Execute command surveys the network through M (maximum number of available frequencies depending on the last selected band) channels. The survey stops as soon as it finds <n> BCCH carriers. The result format is like command #CSURV. The result format is like command #CSURVC.

Test command reports the value range for parameter <n> in the format:

(1-M)

where M is the maximum number of available frequencies depending on last selected band.

Syntax

Command	Command type
AT#CSURVBC=<n>]	Execute
AT#CSURVBC=?]	Test

Parameters and Values

<n> Number of desired BCCH carriers.
1..M

Network Survey Format #CSURVF

Set command controls the format of the numbers output by all the Easy Scan commands.

Read command reports the current number in the format:

<format>

Test command reports the value range for parameter <format>.

Syntax

Command	Command type
AT#CSURVF=<format>]	Set
AT#CSURVF?	Read
AT#CSURVF=?]	Test

Parameters and Values

<format> Numbers format.
0 Decimal. **Default: 0.**
1 Hexadecimal values without text.
2 Hexadecimal values with text.

Remove <CR><LF> on Easy Scan Commands Family #CSURVNLF

Set command enables or disables the automatic <CR><LF> removal from each information text line.

Read command reports whether automatic <CR><LF> removal is currently enabled or not, in the format:

<value>

Test command reports the value range for parameter <value>.

Syntax

Command	Command type
AT#CSURVNLF=[<format>]	Set
AT#CSURVNLF?	Read
AT#CSURVNLF=?	Test

Parameters and Values

<values>

- 0** Keeps <CR><LF> in the information next. **Default: 0.**
- 1** Removes <CR><LF> from information text.

Extended Network Survey #CSURVEXT

Set command enables or disables extended network survey.

Read command reports whether extended network survey is currently enabled, in the format:

<value>

Test command reports the value range for parameter <value>.

Syntax

Command	Command type
AT#CSURVEXT=[<format>]	Set
AT#CSURVEXT?	Read
AT#CSURVEXT=?	Test

Parameters and Values

<values>

- 0** Disables extended network survey. **Default: 0.**
- 1** Enables extended network survey. All network survey execution commands (#CSURV, #CSURVC, #CSURVU, #CSURVUC, #CSURVB, #CSURVBC) display the BAList for every valid scanned BCCh carrier.
- 2** Enables extended network survey. All the network survey execution commands (#CSURV, #CSURVC, #CSURVU, #CSURVUC, #CSURVB, #CSURVBC) display the BAList for every valid scanned BCCh carrier and, if GPRS is supported in the cell, they report some GPRS information carried by the System Information 13 of the BCCh.

PLMN Network Survey #CSURVP

Execute command surveys through channels. The survey stops as soon as a BCCH carriers belonging to the selected PLMN if found. The result format is like command #CSURV.

Test command returns OK.

Syntax

Command	Command type
AT#CSURVP=[<plmn>]	Execute
AT#CSURVP=?	Test

Parameters and Values

<plmn> The desired PLMN in numeric format.

PLMN Network Survey (Numeric Format) #CSURVPC

Execute command surveys through channels. The survey stops as soon as a BCCH carriers belonging to the selected PLMN if found. The result format is like command #CSURVC.

Test command returns OK.

Syntax

Command	Command type
AT#CSURVPC=[<plmn>]	Execute
AT#CSURVPC=?	Test

Parameters and Values

<plmn> The desired PLMN in numeric format.

SIM Toolkit Commands

SIM Toolkit Interface Activation #STIA

Set command activates the SAT sending of unsolicited indications when a proactive command is received from SIM.

Read command can be used to get information about the SAT interface in the format:

```
#STIA: <state>,<mode>,<timeout>,<SatProfile>
```

where:

- <state> State the device is in.
 - 0 SIM has not started its application yet.
 - 1 SIM has started its application (SAT main menu ready).
- <mode> SAT and unsolicited indications enabling status.
- <timeout> Time-out for user responses.
- <SatProfile> SAT Terminal Profile according to GSM 11.14, that is, the list of SIM Application Toolkit facilities that are supported by the ME. The profile cannot be changed by the TA.

Note: In SAT applications, usually an SMS message is sent to the network provider containing service requests, for example to send the latest news. The provider returns a message with the requested information.

Before activating SAT it is recommended to set the SMS text mode with command AT+CMGF=1 and to enable unsolicited indications for incoming SMS messages with command +CNMI.

Test command returns the range of available values for the parameters <mode> and <timeout>.

Syntax

Command	Command type
AT#STIA=[<mode>[,<timeout>]]	Set
AT#STIA?	Read
AT#STIA=?	Test

Parameters and Values

- <mode>
 - 0 Disable SAT.
 - 1 Enable SAT without unsolicited indication #STN. **Default: 1.**
 - 2 Enable SAT and extended unsolicited indication #STN. See #STGI.
 - 3 Enable SAT and reduced unsolicited indication #STN. See #STGI.
 - 17 Enable SAT without unsolicited indication #STN and 3GPP TS 23.038 alphabet used.
 - 18 Enable SAT and extended unsolicited indication #STN (see #STGI) and 3GPP TS 23.038 alphabet used.
 - 19 Enable SAT and reduced unsolicited indication #STN (see #STGI)and 3GPP TS 23.038 alphabet used.

- 33** Enable SAT without unsolicited indication #STN and UCS2 alphabet used.
- 34** Enable SAT and extended unsolicited indication #STN (see #STGI) and UCS2 alphabet used.
- 35** Enable SAT and reduced unsolicited indication #STN (see #STGI) and UCS2 alphabet used.
- Note: An unsolicited result code—#STN: 254—is sent if the user has indicated the need to end the proactive SIM application session: AT#STSR=<cmdType>, 16—that is, “proactive SIM application session terminated by the user” according to GSM 11.14.
- The TA does not need to respond directly, that is, AT#STSR is not required. It is possible to restart the SAT session from the main menu again with the command AT#STGI=37.
- Note: The settings are saved on user profile and available on following reboot. SIM Toolkit activation/deactivation is only performed at power on.
- <timeout>** Time out for user responses.
- 1-255** Time-out in minutes. **Default: 10.** Any ongoing (but unanswered) proactive command is aborted automatically after <timeout> minutes. In this case, the terminal response is either “ME currently unable to process command”, or if applicable, “No response from user”. In addition an unsolicited indication is sent to the external application:
- #STN: <cmdTerminateValue>
- where:
- <cmdTerminateValue> is defined as <cmdType> + terminate offset. The terminate offset equals 100.
- Note: Every time the SIM application issues a proactive command that requires user interaction an unsolicited code is sent, if enabled with #STIA command, as follows:
- If <mode> parameter of #STIA command is set to 3 (reduced unsolicited indication) an unsolicited indication is sent, indicating the type of proactive command issued by the SIM:
- #STN: <cmdType>
- If <mode> parameter of #STIA command is set to 2 (extended unsolicited indication) the format of the unsolicited indication depends on the specific command:
- if <cmdType>=1 (REFRESH)
- an unsolicited notification is sent to the user:
- #STN: <cmdType>,<refresh type>
- where:
- <refresh type>
- 0 - SIM Initialization and Full File Change Notification.
 - 1 - File Change Notification.
 - 2 - SIM Initialization and File Change Notification.
 - 3 - SIM Initialization.
 - 4 - SIM Reset.
- In this case neither #STGI nor #STSR commands are required:
- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.
- if <cmdType>=17 (SEND SS)
- if <cmdType>=19 (SEND SHORT MESSAGE)
- if <cmdType>=20 (SEND DTMF)
- if <cmdType>=32 (PLAY TONE)

an unsolicited notification is sent if allowed by SIM (see GSM 11.14):

#STN: <cmdType>[,<text>]

where:

<text> - (optional) text to be displayed to user.

In these cases neither #STGI nor #STSR commands are required:

- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

In case of SEND SHORT MESSAGE (<cmdType>=19) command if sending to network fails an unsolicited notification is sent.

#STN: 119

if <cmdType>=33 (DISPLAY TEXT)

an unsolicited notification is sent if allowed by SIM (see GSM 11.14):

#STN: <cmdType>[,<cmdDetails>[,<text>]]

where:

<cmdDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - normal priority.

1 - high priority.

bits 2 to 7: reserved for future use.

bit 8:

0 - clear message after a delay.

1 - wait for user to clear message.

<text> - (optional) text to be displayed to user.

In this case:

1. If <cmdDetails>/bit8 is 0 neither #STGI nor #STSR commands are required:

- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

2. If <cmdDetails>/bit8 is 1 #STSR command is required.

if <cmdType>=40 (SET UP IDLE MODE TEXT) an unsolicited notification is sent:

#STN: <cmdType>[,<text>]

where:

<text> - (optional) text to be displayed to user.

In these cases neither #STGI nor #STSR commands are required:

- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

if <cmdType>=18 (SEND USSD)

an unsolicited notification is sent to the user:

#STN: <cmdType>[,<text>]

where:

<text> - optional text string sent by SIM.

In this case:

- AT#STSR=18,20 can be sent to end USSD transaction.
- AT#STGI is accepted anyway.

- AT#STSR=<cmdType>,0 answers OK but does nothing.
- if <cmdType>=5 (SET UP EVENT LIST) an unsolicited notification is sent:
#STN: <cmdType>[,<event list mask>]
where:
<event list mask> - (optional) hexadecimal number representing the list of events to monitor (see GSM 11.14).
- '00' = MT call.
 - '01' = Call connected.
 - '02' = Call disconnected.
 - '03' = Location status.
 - '04' = User activity.
 - '05' = Idle screen available.
 - '06' = Card reader status (if class "a" is supported).
 - '07' = Language selection.
 - '08' = Browser Termination (if class "c" is supported).
 - '09' = Data available (if class "e" is supported).
 - '0A' = Channel status (if class "e" is supported).

The hexadecimal number is actually a bit mask, where each bit, when set, indicates that the corresponding event has to be monitored (for example, if <event list mask> is 0x0001, it means that MT call has to be monitored).

In these cases neither #STGI nor #STSR commands are required:

- AT#STGI is accepted anyway.
- AT#STSR=<cmdType>,0 answers OK but does nothing.

All other commands:

the unsolicited indication reports just the proactive command type:

#STN: <cmdType>

Note: If the call control or SMS control facility in the SIM is activated, when the customer application makes an outgoing call, or sends an SS or USSD, or an SMS, the following #STN unsolicited indication can be sent, according to GSM 11.14, to indicate whether the outgoing call is accepted, rejected or modified by the SIM, or if the SMS service centre address or destination is changed:

#STN: <cmdTerminateValue>,<Result>[,<TextInfo>[,<Number>[,<MODestAddr>]]]

where

<cmdTerminateValue>

150 - SMS control response.

160 - call/SS/USSD response.

<Result>

0 - Call/SMS not allowed.

1 - Call/SMS allowed.

2 - Call/SMS allowed with modification.

<Number> - Called number, Service Center Address or SS String in ASCII format.

<MODestAddr> - MO destination address in ASCII format.

<TextInfo> - alpha identifier provided by the SIM in ASCII format.

Notes:

- Only one instance at a time—the one which first issued AT#STIA=n (with n different from zero)—is allowed to issue SAT commands. This is valid until the same instance issues AT#STIA=0.
- After power cycle another instance can enable SAT.
- A typical SAT session on AT interface starts after an #STN: 37 unsolicited code is received, if enabled (see above). At that point usually an AT#STGI=37 command is issued (see #STGI), and after the SAT main menu is displayed on TE an AT#STSR=37,0,x command is issued to select an item in the menu. See #STSR.

SIM Toolkit Get Information #STGI

#STGI set command requests the parameters of a proactive command from the ME.

Read command can be used to request the currently ongoing proactive command and the SAT state in the format

#STGI: <state>,cmdType>

where:

- <state> SAT interface state. See #STIA.
- <cmdType> Ongoing proactive command.

An error message is returned if there is no pending command.

Test command returns the range for the parameters <state> and <cmdType>.

Syntax

Command	Command type
AT#STGI=[<cmdType>]	Set
AT#STGI?	Read
AT#STGI=?	Test

Parameters and Values

- <cmdType> Proactive command ID according to GSM 11.14 (decimal). These are only those command types that use the AT interface.
SAT commands that are not using the AT interface (not MMI related SAT commands, for example PROVIDE LOCAL INFORMATION) are executed without sending any indication to the user.
- 1 REFRESH.
- 5 SET UP EVENT LIST.
- 16 SET UP CALL.
- 17 SEND SS.
- 18 SEND USSD.
- 19 SEND SHORT MESSAGE.
- 20 SEND DTMF.
- 32 PLAY TONE.
- 33 DISPLAY TEXT.
- 34 GET INKEY.
- 35 GET INPUT.
- 36 SELECT ITEM.
- 37 SET UP MENU.

40

SET UP IDLE MODE TEXT.

Requested command parameters are sent using an #STGI indication:

#STGI: <parameters>

where <parameters> depends upon the ongoing proactive command as follows:

if <cmdType>=1 (REFRESH)

#STGI: <cmdType>,<refresh type>

where:

<refresh type>

- 0 - SIM Initialization and Full File Change Notification;
- 1 - File Change Notification;
- 2 - SIM Initialization and File Change Notification;
- 3 - SIM Initialization;
- 4 - SIM Reset

if <cmdType>=5 (SET UP EVENT LIST)

#STGI: <cmdType>,<event list mask>

where:

<event list mask> - hexadecimal number representing the list of events to monitor (see GSM 11.14):

- '00' = MT call
- '01' = Call connected
- '02' = Call disconnected
- '03' = Location status
- '04' = User activity
- '05' = Idle screen available
- '06' = Card reader status (if class "a" is supported)
- '07' = Language selection
- '08' = Browser Termination (if class "c" is supported)
- '09' = Data available (if class "e" is supported)
- '0A' = Channel status (if class "e" is supported)

The hexadecimal number is actually a bit mask, where each bit, when set, indicates that the corresponding event has to be monitored (for example, if <event list mask> is 0x0001, it means that MT call has to be monitored).

if <cmdType>=16 (SET UP CALL)

#STGI: <cmdType>,<commandDetails>,<confirmationText>,<calledNumber>

where:

<commandDetails> - unsigned integer, used as an enumeration

- 0 Set up call, but only if not currently busy on another call
- 1 Set up call, but only if not currently busy on another call, with redial
- 2 Set up call, putting all other calls (if any) on hold
- 3 Set up call, putting all other calls (if any) on hold, with redial
- 4 Set up call, disconnecting all other calls (if any)
- 5 Set up call, disconnecting all other calls (if any), with redial

<confirmationText> - string for user confirmation stage

<calledNumber> - string containing called number

if <cmdType>=17 (SEND SS)
if <cmdType>=18 (SEND USSD)
if <cmdType>=19 (SEND SHORT MESSAGE)
if <cmdType>=20 (SEND DTMF)
if <cmdType>=32 (PLAY TONE)
if <cmdType>=40 (SET UP IDLE MODE TEXT)

#STGI: <cmdType>[,<text>]

where:

<text> - text to be displayed to user

if <cmdType>=33 (DISPLAY TEXT)
#STGI: <cmdType>,<cmdDetails>[,<text>]

where:

<cmdDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - normal priority

1 - high priority

bits 2 to 7: reserved for future use

bit 8:

0 - clear message after a delay

1 - wait for user to clear message

<text> - text to be displayed to user

if <cmdType>=34 (GET INKEY)

#STGI: <cmdType>,<commandDetails>,<text>

where:

<commandDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - Digits only (0-9, *, # and +)

1 - Alphabet set;

bit 2:

0 - SMS default alphabet (GSM character set)

1 - UCS2 alphabet

bit 3:

0 - Character sets defined by bit 1 and bit 2 are enabled

1 - Character sets defined by bit 1 and bit 2 are disabled and the "Yes/No"

response is requested

bits 4 to 7:

0

bit 8:

0 - No help information available

1 - Help information available

<text> - String as prompt for text.

if <cmdType>=35 (GET INPUT)
 #STGI: <cmdType>,<commandDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

where:

<commandDetails> - unsigned Integer used as a bit field.

0-255 - used as a bit field:

bit 1:

0 - Digits only (0-9, *, #, and +)

1 - Alphabet set

bit 2:

0 - SMS default alphabet (GSM character set)

1 - UCS2 alphabet

bit 3:

0 - ME may echo user input on the display

1 - User input is not revealed in any way. Hidden entry mode (see GSM 11.14) is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.

bit 4:

0 - User input to be in unpacked format

1 - User input to be in SMS packed format

bits 5 to 7:

0

bit 8:

0 - No help information available

1 - Help information available

<text> - string as prompt for text

<responseMin> - minimum length of user input

0-255

<responseMax> - maximum length of user input

0-255

<defaultText> - string supplied as default response text

if <cmdType>=36 (SELECT ITEM)

The first line of output is:

#STGI: <cmdType>,<commandDetails>,<numOfItems>[,<titleText>]
 <CR><LF>

One line follows for every item, repeated for <numOfItems>:

#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]

where:

<commandDetails> - unsigned Integer used as a bitfield

0-255 - used as a bit field:

bit 1:

0 - Presentation type is not specified

1 - Presentation type is specified in bit 2

bit 2:

0 - Presentation as a choice of data values if bit 1 = '1'

1 - Presentation as a choice of navigation options if bit 1 is '1'
bit 3:
0 - No selection preference
1 - Selection using soft key preferred
bits 4 to 7:
0
bit 8:
0 - No help information available
1 - Help information available
<numOfItems> - number of items in the list
<titleText> - string giving menu title
<itemId> - item identifier
1..<numOfItems>
<itemText> - title of item
<nextActionId> - the next proactive command type to be issued upon execution of the menu item.
0 - no next action information available.

if <cmdType>=37 (SET UP MENU)
The first line of output is:
#STGI: <cmdType>,<commandDetails>,<numOfItems>,<titleText>
<CR><LF>

One line follows for every item, repeated for <numOfItems>:
#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]

where:
<commandDetails> - unsigned Integer used as a bitfield
0-255 - used as a bit field:
bit 1:
0 - no selection preference
1 - selection using soft key preferred
bit 2 to 7:
0
bit 8:
0 - no help information available
1 - help information available
<numOfItems> - number of items in the list
<titleText> - string giving menu title
<itemId> - item identifier
1..<numOfItems>
<itemText> - title of item
<nextActionId> - the next proactive command type to be issued upon execution of the menu item.
0 - no next action information available.

Note: Upon receiving the #STGI response, the TA must send #STSR command (see below) to confirm the execution of the proactive command and provide any required user response, for example selected menu item.

Notes

- The unsolicited notification sent to the user:

#STN: 37

Indicates that the main menu of the SIM Application is sent to the TA. It is stored by the TA so that it can be displayed later at any time by issuing an AT#STGI=37 command.

A typical SAT session on AT interface starts after a #STN: 37 unsolicited code is received, if enabled. At that point usually an AT#STGI=37 command is issued, and after the SAT main menu is displayed on TE an AT#STSR=37,0,x command is issued to select an item in the menu (see below). The session usually ends with a SIM action like sending an SMS, or starting a call. After this, to restart the session from the beginning going back to SAT main menu it is usually required an AT#STSR=37,16 command.

- The unsolicited notification sent to the user:

#STN:237

Indicates that the main menu of the SIM Application is removed from the TA, and it is no longer available. In this case AT#STGI=37 command response is always ERROR.

SIM Toolkit Send Response #STSR

The write command provides, to the SIM, a user's response to a command and any required user information, for example a selected menu item.

Read command requests the currently ongoing proactive command and the SAT state in the format:

#STSRI: <state>,<cmdType>

where:

<state> SAT interface state. See #STIA.

<cmdType> On-going proactive command.

An error message is returned if there is no pending command.

Test command returns the range for the parameters <state> and <cmdType>.

Syntax

Command	Command type
AT#STSR=[<cmdType>,<userResponse>[,<data>]]	Write
AT#STSR?	Read
AT#STSR=?	Test

Parameters and Values

<cmdType>	Integer type; proactive command ID according to GSM 11.14. See #STGI.
<userResponse>	Action performed by the user.
0	Command performed successfully. Call accepted in case of call setup.
16	Proactive SIM session terminated by user.
17	Backward move in the proactive SIM session requested by the user.
18	No response from user.
19	Help information required by the user.
20	USSD/SS Transaction terminated by user.
32	TA currently unable to process command.
34	User denied SIM call setup request.
35	User cleared down SIM call before connection or network release.
<data>	Data entered by user, depending on <cmdType>, only required if <Result> is 0.
Get Inkey	<p><data> contains the key that is user pressed. Used character set is selected with +CSCS.</p> <p>Note: If, as a user response, a binary choice (Yes/No) is requested by the SIM application using bit 3 of the <commandDetails> parameter the valid content of the <inputString> is:</p> <p>a) "IRA", "8859-1", "PCCP437" charsets: "Y" or "y" (positive answer) and "N" or "n" (negative answer)</p> <p>b) UCS2 alphabet "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer)</p>
Get Input	
Select Item	<p><data> - contains the string of characters entered by the user (see above).</p> <p><data> - contains the item identifier selected by the user.</p> <p>Note: Use of icons is not supported. All icon related actions respond with no icon available.</p>

SIM Toolkit Terminal Attach #STTA

Set command attaches/detaches the SIM Toolkit application to the AT instance reserved for this use.

Read command reports the current <state> in the format:

#STTA: <state>

Test command reports the supported range of values for <state>.

Syntax

Command	Command type
AT#STTA=<state>	Set
AT#STTA?	Read
AT#STTA=?	Test

Parameters and Values

<state>	Attached state.
0	SIM Toolkit detaches.
1	SIM Toolkit attaches.
	If SIM Toolkit application is already attached/detached the command does nothing and returns OK.

Notes

- AT instance #3 is reserved for the SIM Toolkit application.
- Issuing AT#STTA=<state> when the AT instance is already attached to another service (CMUX, SMSATRUN/TCPATRUN) causes an ERROR result code to be returned.

Jammed Detect and Report AT Commands

Jammed Detect and Report #JDR

Set command allows control of the Jammed Detect and Report feature.

The module can detect if a communication jammer is active in its range and indicate this condition to the user either on the serial line with an unsolicited code.

Read command reports the current behavior mode, maximum noise power level, and disturbed channel minimum number, in the format:

#JDR: <mode>,<MNPL>,<DCMN>

Test command reports the supported range of values for <mode>,<MNPL>, and <DCMN>.

Syntax

Command	Command type
AT#JDR=[<mode>,<MNPL>,<DCMN>]]	Set
AT#JDR?	Read
AT#JDR=?	Test

Parameters and Values

<mode>	Jammed Detect & Report behavior mode
0	Disables Jammed Detect & Report. Default: 0.
1	Enables jammed detect.
2	Enables the jammed detect. The jammed condition is reported with a single unsolicited result code on serial line, in the format: #JDR: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE - Normal operating condition restored. This code appears only after a jammed condition.
3	Enables jammed detect. The module makes both <mode>=1 and <mode>=2 actions.
4	Enables the jammed detect. The jammed condition is reported with an unsolicited code every 3 seconds on serial line, in the format: #JDR: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE – Normal operating condition restored. This code appears only after a jammed condition.
5	Enables jammed detect. The module makes both <mode>=1 and <mode>=4 actions.
6	Enables jammed detect. The jammed condition is reported in the format: #JDR: <status> where: <status> JAMMED - Jammed condition detected. OPERATIVE - Normal operating condition restored. This code appears only a jammed condition. UNKNOWN – Default state before first successful PLMN searching.
<MNPL>	Maximum noise power level.
0..127	Default: 70.
<DCMN>	Disturbed channel minimum number
0..254	Default: 5.

Notes

- Issuing AT#JDR<CR> is the same as issuing the read command.
- Issuing AT#JDR=<CR> is the same as issuing the command AT#JDR=0<CR>.

Example

```

AT#JDR=2
OK
...jammer enters in the range...
#JDR: JAMMED
...jammer exits the range...
#JDR: OPERATIVE
AT#JDR=6
#JDR: JAMMED //when jammed
OK
AT#JDR=6
#JDR: OPERATIVE //when in normal operating mode
OK
AT#JDR=6
#JDR: UNKNOWN // default state before 1st PLMN searching
OK

```

Jammed Detect and Report Enhanced #JDRENH

Set command allows you to control enhanced Jammed Detection and Reporting.

The module can detect if a communication jammer is active in its range and indicate this condition to the user either on the serial line with an unsolicited code.

Read command reports the currently selected parameters, in the format:

```
#JDRENH: <type>,<mode>,<Param>,<Param2>,<Time>
```

Test command reports the supported range of values for <type>,<mode>,<Param>, <Param2>, and <Time>.

Syntax

Command	Command type
AT#JDRENH[=<type>,<mode>,<Param>,<Param2>,<Time>]]]	Set
AT#JDRENH?	Read
AT#JDRENH=?	Test

Parameters and Values

<type>	Jammed Detecting and Reporting behavior mode
0	Disables Jammed Detect & Report. Default: 0.
1	Enables jammed detect.
2	Enables the jammed detect. The jammed condition is reported with a single unsolicited result code on serial line, in the format: #JDRENH: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE - Normal operating condition restored. This code appears only after a jammed condition.
3	Enables jammed detect. The module makes both <type>=1 and <type>=2 actions.
4	Enables the jammed detect. The jammed condition is reported with an unsolicited code every 3 seconds on serial line, in the format: #JDRENH: <status> where: <status> JAMMED - Jammed condition detected OPERATIVE – Normal operating condition restored. This code appears only after a jammed condition.
5	Enables jammed detect. The module makes both <type>=1 and <type>=4 actions.
<mode>	This parameter decides which method is used to detect a jamming condition. Note: If the <type> is not 0, <Param1> and <Param2> are set to default value depending on which <mode> has been chosen.
1	First method.
2	Second method.
<Param>	Function depends on which mode is selected. If the <type> is not 0, <Param> is set to default value depending on which <mode> has been chosen. <mode>=1 – This parameter sets the minimum number of BSIC FAIL for Bank. Possible values are 1-50. <mode>=2 – This parameter sets the minimum difference between two power levels [dBm] for same ARFCN to signaling a jammed channel. Possible values are 1-20. Default values for <param> depend on <mode>: If <mode>=1, default value is 10. If <mode>=2, default value is 5.

<Param2>	<p>Function depends on which <mode> has been selected. If the <type> is not 0, <Param2> is set to default value depending on which <mode> has been chosen.</p> <p><mode>=1 – For first method, this parameter is used to set the minimum power [dBm] that allows counting a BSIC FAIL only if the power of that carrier is greater than this parameter. Possible values are 35 – 127 dBm.</p> <p><mode>=2 – For second method, this parameter is used to set the minimum number of jammed ARFCN channel to signal a jammed situation. Possible values are 1 – 20.</p> <p>Default values for <param> depend on <mode>: If <mode>=1, default value is 110. If <mode>=2, default value is 5.</p>
<Time>	<p>Sets the jamming notification time. It works with both methods. The timer starts when a jammed situation detected. When this timer expires, if the module has not received any BSIC the module starts the jamming indication.</p>
1..255	<p>If 255 is set, the module sends the jamming indication when has tried to read the BSIC information from all-powerful frequencies. Default: 1.</p>

Easy Script® Extension Python Interpreter Commands

Note: Scripting support might require some professional services.

Write Script #WSCRIPT

Execute command causes the module to store a file in the Easy Script related non-volatile memory, naming it <script_name>.

The file should be sent using RAW ASCII file transfer.

It is important to set properly the port settings. In particular:

Flow control: hardware.

Baud rate: 115200 bps

Test command returns OK result code.

Syntax

Command	Command type
AT#WSCRIPT=[<script_name>,<size>,[<hidden>]]	Set
AT#WSCRIPT=?	Test

Parameters and Values

<script_name>	String type, name of the file in non-volatile memory. Maximum 16 characters, case sensitive.
<size>	File size in bytes.
<hidden>	File hidden attribute.
0	File content is readable with #RSCRIPT. Default: 0.
1	File content is hidden, #RSCRIPT command reports empty file. The device prompts a five character sequence <CR><LF><greater_than><greater_than><greater_than> (IRA 13, 10, 62, 62, 62) after command line is terminated with <CR>. After that, a file can be entered from TE, sized <size> bytes. The operations completes when all the bytes are received. If writing ends successfully, the response is OK, otherwise an error code is reported.

Notes

- Place the file name in quotes. Every textual script file must have .py extension. Every pre-compiled executable script file must have .pyo extension. File names are case sensitive.
- When sending the script be sure that the line terminator is <CR><LF> and that your terminal program does not change it.
- Using the hidden attribute, you can protect your files from being viewed and copied. Only the file name can be viewed, its content is hidden even if the file is still being run correctly. Ensure you maintain knowledge about what the file contains.
- It's recommended to use the extension .py only for textual script files and the extension .pyo only for pre-compiled executable script files.

Example

```
AT#WSCRIPT="First.py",54,0
```

>>> here receive the prompt; then type or send the textual script, sized 54 bytes.

OK

Textual script has been stored.

Select Active Script #ESCRPT

Set command selects either:

- The name of the textual script file that is compiled and executed by the Easy Script® compiler at startup according to last #STARTMODESCR setting, or
- The name of the pre-compiled executable file that is executed at startup according to last #STARTMODESCR setting.

This file, either textual or pre-compiled, is called the current script.

Read command reports as a quoted string the file name of the current script.

Test command returns OK result code.

Syntax

Command	Command type
AT#ESCRPT=[<script_name>]	Set
AT#ESCRPT?	Read
AT#ESCRPT=?	Test

Parameters and Values

<script_name> String type, file name. Maximum 16 characters, case sensitive.

Notes

- All textual script files must have .py extension. All pre-compiled executable files must have .pyo extension.
- <script_name> must match to the name of a file written by #WSCRIPT to have it run.
- The command does not check whether a textual script named <script_name> exists in the Easy Script related non-volatile memory. If the file <script_name> is not present at startup then the compiler does not execute.

Script Execution Start Mode #STARTMODESCR

Set command sets the current script (see #ESCRIP) execution start mode.

Read command reports the current script start mode and the current script start time-out, in the format:

#STARTMODESCR= <script_start_mode>,<script_start_timeout>

Test command returns the range of available values for <script_start_mode> and <script_start_timeout>, in the format:

#STARTMODESCR: (0,2),(10-60)

Syntax

Command	Command type
AT#STARTMODESCR=<script_start_mode>[,<script_start_to>]	Set
AT#STARTMODESCR?	Read
AT#STARTMODESCR=?	Test

Parameters and Values

<script_start_mode>	Current script execution start mode.
0	Current script is executed at startup only if the DTR line is found Low (COM is not open on a PC), otherwise, the Easy Script interpreter does execute and the module behaves normally answering only to AT commands on the serial port. Default: 0.
1	Current script is executed at startup only if the user does not send any AT command on the serial port for the time interval specified in <script_start_to> parameter. Otherwise, the Easy Script interpreter does not execute and the module behaves normally answering only to AT commands on the serial port. The DTR line is not tested.
<script_start_to>	Current script start time-out. 10-60 - time interval in seconds. This parameter is used only if parameter <script_start_mode> is set to 1. It is the waiting time for an AT command on the serial port to disable active script execution start. If the user does not send any AT command on the serial port for the time specified in this parameter active script is not be executed. Default: 10.

Execute Active Script #EXECSCR

Execute command causes the current script (see #ESCRIP) execution not at startup.

This command is useful when the execution at startup is blocked deliberately and the user wants to control execution start.

Test command returns OK result code.

Syntax

Command	Command type
AT#EXECSCR	Set
AT#EXECSCR=?	Test

Read Script #RSCRIPT

Execute command reports the content of file <script_name>.

Test command returns OK result code.

Syntax

Command	Command type
AT#RSCRIPT=[<script_name>]	Set
AT#RSCRIPT=?	Test

Parameters and Values

<script_name> String type, file name. Maximum 16 characters, case sensitive.
 The device prompts a five character sequence

 <CR><LF><less_than><less_than><less_than>(IRA 13, 10, 60, 60, 60)
 followed by the file content.

Notes

- If the file <script_name> was saved with the hidden attribute, then an empty file is reported with the OK result code.
- If the file <script_name> is not present, an error code is reported.

Examples

```
AT#RSCRIPT="First.py"
```

hereafter receive the prompt; then the script is displayed, immediately after the prompt

```
<<<import MDM
MDM.send('AT\r',10)
Ans=MDM.receive(20)
OK
```

List Script Names #LSCRIPT

Execute command reports the list of file names for the files currently stored in the Easy Script related non-volatile memory and the available free non-volatile memory in the following format.

Note: May also list files written via AT#MMSATTD.

```
[#LSCRIPT: <script_name1>,<size1>...
```

```
[<CR><LF>#LSCRIPT: <script_namen>,<sizen>]]
```

```
<CR><LF>#LSCRIPT: free bytes: <free_non-volatile memory>
```

where:

<script-namen>	File name, quoted string type. Maximum 16 characters, case sensitive.
<size>	Size of script in bytes.
<free_non-volatile memory>	Size of available non-volatile memory in bytes.

Test command returns OK result code.

Syntax

Command	Command type
AT#LSCRIPT	Execute
AT#LSCRIPT=?	Test

Examples

```
AT#LSCRIPT
#LSCRIPT: "First.py",51
#LSCRIPT: "Second.py",178
#LSCRIPT: "Third.py",95
#LSCRIPT: free bytes: 20000
OK
```

List Script Names #LCSCRIPT

Execute command lists file names for files currently stored in the Easy Script related non-volatile memory, adding CRC16 information, and the available free non-volatile memory in the following format.

Note: May also list files written via AT#MMSATTD.

```
[#LCSCRIPT: <script_name1>,<size1>[,<crc1>]...
```

```
[<CR><LF>#LCSCRIPT: <script_namen>,<size>[,<crcn>]]]
```

```
<CR><LF>#LCSCRIPT: free bytes: <free_non-volatile memory>
```

where:

<script-namen>	File name, quoted string type. Maximum 16 characters, case sensitive.
<size>	Size of script in bytes.
<crcn>	CRC16 poly ($x^{16}+x^{12}+x^5+1$) of script in hex format.
<free_non-volatile memory>	Size of available non-volatile memory in bytes.

Note:

CRC16 is calculated using the standard CRC16-CCITT $x^{16}+x^{12}+x^5+1$ polynomial (0x1021 representation) with initial value FFFF.

If one file currently stored in non-volatile memory is in use, then CRC16 cannot be calculated and Execute command does not report <crcn> for that file. This is always true if a Python script executes command because at least the file pointed by #ESCRIP is in use.

Execute command reports size and CRC16 information of file <script_name> in the format:

[#LCSCRIPT: <script_name>,<size>[,<crc>]]

where:

<script_name> - file name, quoted string type. Maximum 16 characters, case sensitive.

<size> - size of script in bytes

<crc> - CRC16 poly ($x^{16}+x^{12}+x^5+1$) of script in hex format

Parameter:

<script_name> - String type, file name. Maximum 16 characters, case sensitive.

Notes:

CRC16 is calculated using the standard CRC16-CCITT $x^{16}+x^{12}+x^5+1$ polynomial (0x1021 representation) with initial value FFFF.

If file <script_name> is in use, CRC16 cannot be calculated. Execute command does not report <crc>.

If file <script_name> is not in the list of files stored in non-volatile memory Execute command exits with error message.

Test command returns OK result code.

Syntax

Command	Command type
AT#LCSCRIPT	Execute
AT#LCSCRIPT=<script_name>	Execute
AT#LCSCRIPT=?	Test

Parameters and Values

<script_name> String type, file name. Maximum 16 characters, case sensitive.
The device prompts a five character sequence
<CR><LF><less_than><less_than><less_than>(IRA 13, 10, 60, 60, 60)
followed by the file content.

Examples

```
AT#LCSCRIPT
#LCSCRIPT: "First.py",51,8FD6
#LCSCRIPT: "Second.py",178,A034
#LCSCRIPT: "Third.py",120,7C48
#LCSCRIPT: free bytes: 20000
OK
```

To list a specific script by name AT#LSCRIPT="name.py" rather than just listing all scripts via AT#LSCRIPT command.

```
AT#LCSCRIPT="Second.py"
#LCSCRIPT: "Second.py",178,A034
OK
```

If file Third.py is already in use, CRC value is not displayed in response.

```
AT#LCSCRIPT
#LCSCRIPT: "First.py",51,8FD6
#LCSCRIPT: "Second.py",178,A034
#LCSCRIPT: "Third.py",120
#LCSCRIPT: free bytes: 20000
OK
```

Delete Script #DSCRIPT

Execute command deletes a file from Easy Script related non-volatile memory.

Test command returns OK result code.

Syntax

Command	Command type
AT#DSCRIPT=[<script_name>]	Execute
AT#DSCRIPT=?	Test

Parameters and Values

<script_name> String type, name of the file to delete. Maximum 16 characters, case sensitive.

Notes

- If the file <script_name> is not present an error code is reported.

Examples

```
AT#DSCRIPT="Third.py"
OK
```

Reboot #REBOOT

Execute command immediately reboots the unit. Use the command to reboot the system after a remote update of the script in order to have the new one running.

Test command returns OK result code.

Syntax

Command	Command type
AT#REBOOT	Execute
AT#REBOOT=?	Test

Notes

- If AT#REBOOT follows an AT command that stores some parameters in non-volatile memory, insert a delay of at least 5 seconds before issuing AT#REBOOT, to complete storing to non-volatile memory.
- AT#REBOOT is an obsolete AT command; it is better to use AT#ENHRST to reboot the module.

Examples

```
AT#REBOOT
```

```
OK
```

```
Module reboots.
```


MMS Commands

Set Network Parameters for MMS #MMSSET

Set command sets MMSC parameters required to send or retrieve an MMS. Note that PDP context <cid> should be previously set by AT+CGDCONT and activated.

Read command the currently selected parameters, in the format:

#MMSSET: <MMS APN>,<MMS proxy>,<MMS port>,<username>,<password>,<mmsc>

Test command reports the supported value range of parameters <MMS APN>,<MMS proxy>,<MMS port>,<username>,<password>,<mmsc>.

Syntax

Command	Command type
AT#MMSSET=<cid>,<MMS proxy>,<MMS port>,<username>,<password>,<mmsc>,<host>	Set
AT#MMSSET?	Read
AT#MMSSET=?	Test

Parameters and Values

<cid>	PDP context identifier. See +CGDCONT.
1-5	Numeric parameter, which specifies a particular PDP context definition.
<MMS proxy>	String that indicates MMS proxy IP address for MMS sending. The length of the string is limited to 50 characters.
<MMS port>	Integer indicating MMS port for MMS sending.
<username>	String indicating the user name that will be used when connecting to the MMS proxy. ASCII characters are valid. Maximum length is 64 characters.
<password>	String indicating the password that will be used when connecting to the MMS proxy. ASCII characters are valid. Maximum length is 40 characters.
<mmsc>	String indicating the MMS Server URL, for example the address for MMS Service Centre name. Maximum length is 50 characters.
<host>	String indicating the "Host:" string to be used in the POST message sent to MMSC, instead of MMS proxy IP address. This string is used if <MMS port> is 0 and is required by some operators. Maximum length is 50 characters.

Notes

- Values set by command are directly stored in non-volatile memory and do not depend on the specific CMUX instance.

General Setting #MMSGS

Set command sets outgoing MMS parameters.

Read command reports the currently selected parameters, in the format:

#MMSGS: <send retries>,<message class>,<priority>,<sender visibility>,<delivery report>,<read report>

Test command reports the supported value range for all parameters.

Syntax

Command	Command type
AT#MMSGS=<send retries>,<message class>,<priority>,<sender visibility>,<delivery report>,<read report>	Set
AT#MMSGS?	Read
AT#MMSGS=?	Test

Parameters and Values

<send retries>	Number of sending retries when sending fails.
1-3	Maximum is 3, including the first attempt. Default: 1.
<message class>	Integer that indicates MMS class.
128	Personal. Default: 128.
129	Advertisement.
130	Informational.
131	Auto.
<priority>	Integer indicating the priority of the MMS assigned by the originator MMS Client.
128	Low.
129	Normal. Default: 129.
130	High.
<sender visibility>	Integer value indicating whether the MMS originator wants to show or hide address.
128	Hide.
129	Show. Default: 129.
<delivery report>	Integer specifying whether originator MMS client request a delivery report from each recipient.
128	Yes.
129	No. Default: 129.
<read report>	Integer specifying whether the originator MMS Client wants a read report from each recipient.
128	Yes.
129	No. Default: 129.

Notes

- Values set by command are directly stored in non-volatile memory and do not depend on the specific CMUX instance.

Create/Update MMS Message Mailing List #MMSTO

Execute command creates or updates a recipients' list for outgoing MMS.

Read command the currently selected <recipients>, in the format:

#MMSTO:<recipients>

Test command reports the supported value range for <op> and <recipients> (maximum number of <recipients> addresses).

Syntax

Command	Command type
AT#MMSTO=<op>,<recipients>	Execute
AT#MMSTO?	Read
AT#MMSTO=?	Test

Parameters and Values

<op>	Operation.
0	Overwrite. Default: 0.
1	Append.
<recipients>	String type indicating the destination addresses for outgoing MMS (phone numbers, separated by ","). There can be up to 20 subscriber numbers. Each subscriber number can be no more than 15 characters.

Notes

- The <recipients> value set by command directly stored in non-volatile memory and doesn't depend on the specific CMUX instance.

Example

To clear whole recipients list:

```
at#mmsto=0,""
```

OK

Send a MMS Message #MMSSEND

Execute command sends an MMS.

Test command tests for command existence.

Syntax

Command	Command type
AT#MMSSEND=<subject>,<attached file>,<recipients>[,<subscriber list>]	Execute
AT#MMSSEND=?	Test

Parameters and Values

<subject>	String indicating MMS subject. Maximum size is 41 characters.
<attached file>	String indicating the image file name to be attached to MMS. Maximum name size is 32 characters.
<recipients>	String type indicating destination addresses for outgoing MMS (phone numbers, separated by ","). There can be up to 20 subscriber numbers. Each subscriber number can be no more than 15 characters.
<subscriber list>	Integer indicating whether or not to use the subscriber list created with #MMSTO.
0	Do not use subscriber list (see #MMSTO), use <recipients>. Default: 0.
1	Use subscriber list (see #MMSTO) ; <recipients> is ignored.

The device responds to the command with the prompt '>' and waits for the message text.

To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex).

If MMS message is sent successfully, the response is OK. If delivery report has been requested, a MMS Delivery Report must be sent from the MMS Proxy-Relay to the originator MMS Client. Upon receiving of such report, an unsolicited code will be sent:

#MMSSEND: <msgID>

where:

<msgID> is the reference originally assigned to the MMS by the MMS Proxy-Relay and included in the corresponding M-Send.conf. The ID enables an MMS Client to match delivery reports with previously sent or forwarded MMS's.

Notes

- If a message fails to send for some reason, an error code is reported.
- Before sending the MMS, define and activate the PDP context <cid> (see #MMSSET command) using +CGDCONT and #SGACT.
- Only .jpg and .gif files can be sent as attachments.

Example

```
at+cgdcont=1,"IP","mms.tim.it","0.0.0.0",0,0
OK
at#sgact=1,1
#SGACT: 10.214.84.15
OK
```

Add MMS Attachment #MMSATTD

Set command stores a file in the non-volatile memory naming it <file name> and then attaches it to a MMS message by #MMSSEND.

Use raw ASCII file transfer to send the file. Port settings should be set properly, in particular:

Flow control: hardware

Baud Rate: 115200 bps

Test command reports maximum length of <file name> and range for <size>.

Syntax

Command	Command type
AT#MMSATTD=<file name>,<size>	Set
AT#MMSATTD=?	Test

Parameters and Values

<file name> String indicates MMS attached file name with extension. Maximum length is 16 characters, including extension. It is case sensitive.

<size> Attached file size, in bytes. Maximum size is 300 Kb.
The device prompts a five character sequence:

<CR><LF><greater_than><greater_than><greater_than>
(IRA 13, 10, 62, 62, 62)

After command line is terminated with <CR>; after that a file can be entered from TE, sized <size> bytes.

The operations completes when all the bytes are received.

If writing ends successfully, the response is OK; otherwise an error code is reported.

Notes

- The file name should be passed between quotes. Only .jpg or .gif images can be stored to be sent as attachment.
- When sending the script be sure that the line terminator is <CR><LF> and that your terminal program does not change it.

HTTP Last Message #MMSMSG

Execute command returns the last response from HTTP server (numerical code and string, if available).

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSMSG	Execute
AT#MMSMSG=?	Test

Set Notification Handling #MMSSNH

Set command enables or disables the received MMS notification unsolicited indication in the ME.

Read command reports whether the unsolicited indication is enabled or not, in the format:

#MMSSNH:<mode>

Test command returns support value range for <mode>.

Syntax

Command	Command type
AT#MMSSNH=<mode>	Set
AT#MMSSNH?	Read
AT#MMSSNH=?	Test

Parameters and Values

<mode>	Notification type.
0	Disabled. Default: 0.
1	Enabled. The ME receives MMS notifications, providing the MMS client with information about an MMS located at the recipient MMS Proxy-Relay and waiting for retrieval, through the following basic unsolicited indication:

#MMSI: "MMS NOTIFICATION"

The notification typically consists of a concatenated SMS in WAP push format. #MMSLN can decode the message.

Use +CMGL to list single SMS in the notification. We recommend using +CNMI to enable unsolicited indication of incoming SMSs holding the notification. Use "AT+CNMI=2,1" to enable unsolicited indication of incoming SMS's holding the notification, and to store them in SIM for subsequent decoding with #MMSLN command.

Example

```
at+cnmi=2,1
OK
#MMSI: "MMS NOTIFICATION"
+CMTI: "SM",1    <--- SMS received
+CMTI: "SM",2    <--- SMS received
at#mmsln
#MMSLN: "+393351510315","da modulo tim a tim
3","http://mms.tim.it/servlets/mms/
mms?CN12_APqoaqljy-IlqT29d@KR0",20000
OK
at+cmgf=1
OK
at+cmgl=ALL
+CMGL: 1,"REC READ","40099","", "12/11/20,10:11:44+04"
0C05040B8423F008042BD902010006256170706C69636174696F6E2F766E642E7761702E6D6D732
D
6D65737361676500AF848D019F8C8298434E31325F4150716F6171316A792D496C7154323964404
B
5230008D908919802B3339333335313531303331352F545950453D504C4D4E00966461206D6F647
5
6C6F2074696D20612074696D2033008A808E024E
+CMGL: 2,"REC UNREAD","40099","", "12/11/20,10:11:45+04"
0C05040B8423F008042BD90202208805810302A2FF83687474703A2F2F6D6D732E74696D2E69742
F
736572766C6574732F6D6D732F6D6D73633F434E31325F4150716F6171316A792D496C715432396
4
404B523000
OK
at+cmgd=1,4  <-- delete all sms
OK
at+cmgl=ALL
OK
at#mmsln  <--- list is now empty
OK
```

List Notifications #MMSLN

Execute command lists MMS notifications waiting to be retrieved from proxy server by reading concatenated SMSs containing the WAP push waiting message notifications from the SIM.

#MMSLN: <fromVal>,<subjVal>,<URI>,<size>

where:

<fromVal>	Sender address.
<subjVal>	Subject.
<URI>	URI used to retrieve message.
<size>	Message size as report by MMSC.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSLN	Set
AT#MMSLN=?	Test

Get MMS #MMSGET

Execute command retrieves an MMS message from proxy server and stores it in the non-volatile memory. Note that PDP content <cid> (see #MMSSET command) must be previously defined and activated using +CGDCONT and #SGACT commands.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSGET= <url>,<size>,<file name>	Execute
AT#MMSGET=?	Test

Parameters and Values

<url>	String indicating MMS address on proxy server, as indicated by AT#MMSLN.
<size>	Message size.
<file name>	String indicating the name of the file in the non-volatile memory used to store the retrieved MMS. Name includes extension .mms. Maximum length is 16 characters including the extension.

Forward MMS #MMSFWD

Execute command forwards an MMS message stored in the proxy server to the specified destination. The PDP context <cid> (see #MMSSET command) must be previously defined and activated using +CGDCONT and #SGACT commands.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSFWD=<da>,<url>	Execute
AT#MMSFWD=?	Test

Parameters and Values

<device_type>	String type indicating the destination addresses for outgoing MMS (phone numbers, separated by ",". There can be up to 20 subscriber numbers. Each subscriber number can be no more than 15 characters).
<url>	String indicating MMS address on proxy server, as indicated by AT#MMSLN command.

Notes

- This command is based on MMS 1.2 or higher and may not be supported by every MMSC. The forward transaction consists of an M-Forward.req message, sent from the MMS Client to the MMS Proxy-Relay, requesting an MMS in the MMS Proxy-Relay be forwarded.

Delete MMS from the MMS Proxy Server #MMSDEL

Set command deletes an MMS message stored in the proxy server. The PDP context <cid> (see #MMSSET command) must be previously defined and activated using +CGDCONT and #SGACT commands.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSDEL=<url>	Set
AT#MMSDEL=?	Test

Parameters and Values

<url>	String indicating MMS address on proxy server, as indicated by AT#MMSLN command.
-------	--

Notes

- This command is based on MMS 1.3 and may not be supported by every MMSC.

List MMS Files #MMSLIMG

Execute command reports the list of image and .mms file names for the files currently stored in the NVM in the format:

MMSLIMG: <img_name1>,<size1>...

[<CR><LF># MMSLIMG: <img_namen>,<sizen>]]

where:

<img-namen>	File name, quoted string type. Maximum 16 characters and case sensitive.
<sizen>	File size in bytes.

In some situations, this command lists Python script files. Ignore Python script files as they are not .MMS or .JPG files.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSLIMG	Set
AT#MMSLIMG=?	Test

Delete Image File #MMSDIMG

Set command deletes file from non-volatile memory.

Test command returns the OK result code.

Syntax

Command	Command type
AT#MMSDIMG=[<img_name>]	Set
AT#MMSDIMG=?	Test

Parameters and Values

<img_name> File name, string type. Maximum 16 characters and case sensitive.

Notes

- If the file <img_name> is not present, an error code is reported.

HTTP Client Commands

Configure HTTP Parameters #HTTPCFG

Set command parameters for an HTTP connection.

Read command returns the current settings for each defined profile, in the format:

```
#HTTPCFG:
<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>
<CR><LF>[<CR><LF>#HTTPCFG:
<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>]
<CR><LF>[...]]
```

Test command returns the support range of <prof_id>, <server_port>, <auth_type>, <ssl_enabled>, <timeout> and <cid> and the maximum length of <server_address>, <username> and <password> parameters in the format:

```
#HTTPCFG: (list of supported <prof_id>s),<s_length>,(list of supported <server_port>s), (list of supported
<auth_type>s),<u_length>,<p_length>,(list of supported <ssl_enabled>s),(list of supported <timeout>s),(list of
supported <cid>s)
```

where:

<s_length>	Integer value indicating the maximum length of <server_address>.
<u_length>	Integer value indicating the maximum length of <username>.
<p_length>	Integer value indicating the maximum length of <password>.

Syntax

Command	Command type
AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout>[,<cid>]]]]]]]	Set
AT#HTTPCFG?	Read
AT#HTTPCFG=?	Test

Parameters and Values

<prof_id> 0-2	Numeric parameter indicating profile identifier.
<server_address>	String parameter indicating the IP address of the HTTP server. This parameter can be either: <ul style="list-style-type: none"> - Any valid IP address in the format: "xxx.xxx.xxx.xxx" - Any host name to be solved with a DNS query Default: "" for first and second profile; "m2mlocate.telit.com" for third profile.
<server_port> 1-65535	Numeric parameter indicating the TCP remote port of the HTTP server to connect to. Default: 80 for first and second profile; 9978 for third profile.
<auth_type> 0 1	Numeric parameter indicating HTTP authentication type. No authentication. Default: 0. Basic authentication.

<username>	String parameter indicating authentication user identification string for HTTP.
<password>	String parameter indicating authentication password for HTTP.
<ssl_enabled>	Numeric parameter indicating if the SSL encryption is enabled.
0	SSL encryption disabled. Default: 0.
1	SSL encryption enabled. Not yet implemented and not available.
<timeout>	Numeric parameter indicating the time interval in seconds to wait for receiving data from HTTP server.
1-65535	Default: 120.
<cid>	Numeric parameter indicating the PDP context identifier.
1-5	Default: 1.

Notes

- A special form of the Set command, #HTTPCFG=<prof_id>, causes the values for profile number <prof_id> to reset to default values.
- If the SSL encryption is enabled, set <cid> to 1.
- Only one profile can use the SSL encryption.
- Values are saved automatically in non-volatile memory.

Send HTTP Get, Head, or Delete Request #HTTPQRY

Execute command performs a Get, Head, or Delete request to the HTTP server.

Test command reports supported value range for <prof_id> and <command> and the maximum length of <resource>, in the format:

#HTTPQRY: (list of supported <prof_id>s),(list of supported <command>s),<r_length>,<m_length>

where:

<r_length>	Integer value indicating maximum length of <resource>.
<m_length>	Integer value indicating maximum length of <extra_header_line>.

Syntax

Command	Command type
AT#HTTPQRY=<prof_id>,<command>,<resource>[,<extra_header_line>]	Set
AT#HTTPQRY=?	Test

Parameters and Values

<prof_id>	Numeric parameter indicating the profile identifier.
0-2	
<command>	Numeric parameter indicating the command requested to HTTP server.
0	GET
1	HEAD
2	DELETE
<resource>	String parameter indicating the HTTP resource (uri), object of the request
<extra_header_line>	String parameter indicating optional HTTP header line.

If sending is successful, the response is OK. Otherwise, an error code is reported.

Note: The HTTP request header sent with #HTTPQRY always contains the "Connection: close" line. It can not be removed.

When the HTTP server answer is received, the following URC is put on the serial port:

```
#HTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>
```

where:

<prof_id> is defined as above

<http_status_code> is the numeric status code, as received from the server.

<content_type> is a string reporting the "Content-Type" header line, as received from the server.

<data_size> is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0.

Notes

- If there is no data from server or the server doesn't answer within the time interval specified in <timeout> parameter of #HTTPCFG command, then the URC #HTTPRING <http_status_code> parameter has value 0.
-

Sent HTTP POST or PUT Request #HTTPPSND

Execute command performs a POST or PUT request to HTTP server and starts sending data to the server. The device prompts a three character sequence:

```
<greater_than><greater_than><greater_than>
```

(IRA 62, 62, 62)

After command line is terminated with <CR>; after that the data can be entered from TE, sized <data_len> bytes.

Test command returns the supported range of <prof_id>, <command> and <data_len> and the maximum length of <resource>, <post_param> and <extra_header_line> in the format:

```
# HTTPSND: (list of supported <prof_id>s),(list of supported <command>s), <r_length>, (list of supported <data_len>s),<p_length>,<m_length>
```

where:

<r_length>	Integer value indicating the maximum length of <resource>.
<p_length>	Integer value indicating the maximum length of parameter <post_param>.
<m_length>	Integer value indicating the maximum length of <extra_header_line>.

Syntax

Command	Command type
AT#HTTPSND=<prof_id>,<command>,<resource>,<data_len>[,<post_param>[,<extra_header_line>]]	Execute
AT#HTTPSND=?	Test

Parameters and Values

<prof_id>	Numeric parameter indicating the profile identifier.
0-2	
<command>	Numeric parameter indicating the command requested to HTTP server.
0	POST
1	PUT
<resource>	String parameter indicating the HTTP resource (uri), object of the request.
<data_len>	Numeric parameter indicating the data length to input in bytes.
<post_param>	Numeric/string parameter indicating the HTTP Content-type identifier, used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier
"0[:extension]"	"application/x-www-form-urlencoded" with optional extension.
"1[:extension]"	"text/plain" with optional extension.
"2[:extension]"	"application/octet-stream" with optional extension.
"3[:extension]"	"multipart/form-data" with optional extension
other content	Free string corresponding to other content type and possible sub-types
<extra_header_line>	String parameter indicating optional HTTP header line.

If sending ends successfully, the response is OK; otherwise an error code is reported.

Note: The HTTP request header sent with #HTTSPND always contains the "Connection: close" line, and it can not be removed.

When the HTTP server answer is received, then the following URC is put on the serial port:

```
#HTTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>
```

where:

<prof_id> is defined as above

<http_status_code> is the numeric status code, as received from the server.

<content_type> is a string reporting the "Content-Type" header line, as received from the server.

<data_size> is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0.

Notes

- If there are no data from server or the server doesn't answer within the time interval specified in <timeout> parameter of #HTTTPCFG command, then the URC #HTTTPRING <http_status_code> parameter has value 0.

Example

Post 100 byte without “Content-type” header

```
AT#HTTPSND=0,0," / ",100
```

```
>>>
```

Post 100 byte with “application/x-www-form-urlencoded”

```
AT#HTTPSND=0,0," / ",100,0
```

```
>>>
```

Post 100 byte with “multipart/form-data” and extension

```
AT#HTTPSND=0,0," / ",100,"3:boundary=----FormBoundary"
```

```
>>>
```

Receive HTTP Server Data #HTTTPRCV

Execute command permits the user to read data from HTTP server in response to a previous HTTP module request. The module is notified of these data by the #HTTTPRING URC. The device prompts a three character sequence:

```
<less_than><less_than><less_than>
```

```
(IRA 60, 60, 60)
```

Followed by the data. If reading ends successfully, the response is OK; otherwise an error code is reported.

Test command reports the supported range of <prof_id>, in the format:

```
# HTTPRCV: (list of supported <prof_id>s)
```

Syntax

Command	Command type
AT#HTTTPRCV=<prof_id>	Set
AT#HTTTPRCV=?	Test

Parameters and Values

<prof_id> Numeric parameter indicating the profile identifier.
0-2

Notes

- If the data are not present or the #HTTTPRING <http_status_code> parameter has value 0, an error code is reported.

SAP AT Commands

Remote SIM Enable #RSEN

Set command enables or disables the Remote SIM feature. If requested on a non-multiplexed interface, the command returns ERROR.

Read command returns the SPA connection status in the format:

#RSEN:<conn>

where:

<conn> Connection status.

Test command reports the value ranges for all parameters.

Syntax

Command	Command type
AT#RSEN=<mode>[,<sapformat>[,<role>[,<muxch>[,<beacon>[,<scriptmode>]]]]]	Set
AT#RESN?	Read
AT#RSEN=?	Test

Parameters and Values

<mode>

0 Disables Remote SIM.

1 Enables Remote SIM.

<sapformat>

1 Binary SAP. **Default: 1.**

<role>

Ringing tone.

0 Remote SIM Client. **Default: 0.**

If the ME doesn't support Easy Script® Extension or if <scriptmode> is omitted or =0.

<muxch> MUX channel number. If <mode>=1, required.

1-3

If the ME supports Easy Script Extension and <scriptmode>=1.

<muxch> MUX interface number in scripts. If <mode>=1, required.

1 MDM interface.

2 MDM2 interface.

<beacon>

SAP connection request retransmission timer

0 Only one transmission. **Default: 0.**

1-100 Timer interval in seconds.

<scriptmode>

Enable script mode. This parameter only has meaning if the ME supports Easy Script Extension.

0 Disables script mode.

1 Enables script mode.

Notes

- If the SIM is already inserted when you enable Remote SIM, the module:
 - De-registers from the network.
 - De-initializes the current SIM.
- Issuing AT#RSEN on a non-multiplexed interface (see +CMUX) causes an ERROR in all situations, except when the ME supports Easy Script Extension and <scriptmode> =1.
- If Remote SIM is activated, the SAP connection status is signaled with the following an unsolicited response codes:

-

#RSEN:<conn>

where:

<conn> Connection status.

0 Disconnected.

1 Connected.

Tones Configuration

Signaling Tones Mode #STM

Set command enables or disables the signaling tones output on the audio path.

Read command reports whether the current signaling tones status is enabled or not, in the format:

#STM: <mode>

Test command reports supported range of values for <mode>.

Syntax

Command	Command type
AT#STM=[<mode>]	Set
AT#STM?	Read
AT#STM=?	Test

Parameters and Values

<mode>	Signaling tones status.
0	Signaling tones disabled.
1	Signaling tones enabled.
2	All tones disabled.

Notes

- AT#STM=0 has the same effect as AT+CALM=2.
- AT#STM=1 has the same effect as AT+CALM=0.

Tone Playback #TONE

Execute command allows the reproduction of DTMF tones, standard free tone, standard busy tone and a set of user defined tones for a certain time.

Test command returns the supported range of values for <tone> and <duration>.

Syntax

Command	Command type
AT#TONE=<tone>[,<duration>]	Execute
AT#TONE=?	Test

Parameters and Values

<tone>	ASCII characters. Range: ((0-9),#,*,(A-D),(G-L),Y,Z).
(0-9), #, *, (A-D)	DTMF tone.
G-L	User-defined tones.
Y	Free tone.
Z	Busy tone.
<duration>	Duration of current tone in 1/10 of second.
1-300	Tenth of seconds Default: 30.

Notes

- For more information about setting user-defined tones see AT#UDTSET.

Extended Tone Generation #TONEEXT

Execute command allows the reproduction of DTMF tones, standard free tone, standard busy tone and a set of user defined tones for a infinite time, or stop the running tone.

Test command returns the range of supported values for <toneld>,<act>.

Syntax

Command	Command type
AT# TONEEXT=<toneld>,<act>	Execute
AT#TONEEXT=?	Test

Parameters and Values

<toneld>	ASCII characters in the set (0-9), #, *, (A-D), (G-L), Y, Z.
(0-9), #, *, (A-D)	DTMF tone.
G-L	User-defined tones.
Y	Free tone.
Z	Busy tone.
<act>	Action to be performed.
0	Stop the <toneld> if running.
1	Start the <toneld>.

Tone Classes Volume #TSVOL

Set command selects the volume mode for one or more tone classes.

Read command returns for each class of tones the last setting of <mode> and, if <mode> is not 0, of <volume> too, in the format:

```
#TSVOL: 1,<mode1>[,<volume1>]<CR><LF>
```

...

```
#TSVOL:128,<mode128>[,<volume128>]
```

Test command returns the supported range of values of <class>, <mode> and <volume>.

Syntax

Command	Command type
AT#TSVOL=<class>,<mode>[,<volume>]	Set
AT#TSVOL?	Read
AT#TSVOL=?	Test

Parameters and Values

<class>	Sum of integers, each representing a class of tones to which the command refers.
1	GSM tones.
2	Ringer tones.
4	Alarm tones.
8	Signaling tones.
16	DTMF tones.
32	SIM toolkit tones.
64	User-defined tones.
128	Dial tones.
255	All classes.
<mode>	Indicates volume that is used for the classes of tones represented by <class>.
0	Default volume is used.
1	The volume <volume> is used.
<volume>	Volume to be applied to the set of classes of tones represented by <class>; it is mandatory if <mode> is 1.
0-max	To get the value of max, issue the test command AT#TSVOL=?.
	GSM Tones:
	BusyToneld
	CongestionToneld
	RadioPathToneld
	CallWaitingToneld
	Ringer Tone:
	RingingToneMOld
	RingingToneMTld
	AutoRedialConnToneld
	Alarm Tones:
	AlarmToneld
	BatteryLowToneld
	SMSToneld
	MMSToneld
	PowerOnToneld
	PowerOffToneld
	NoUnitsLeftToneld
	Signaling Tones:
	classzeroToneld
	NetworkIndToneld
	NoServiceToneld
	SignallingErrToneld
	AutoRedialToneld
	ErrorToneld
	CallDroppedToneld
	DTMF Tones:
	Local ADTMF

SIM Toolkit Tones:

SIMTDialToneId
 SIMTBusyToneId
 SIMTCongestionToneId
 SIMTRadioPathToneId
 SIMTCallDroppedToneId
 SIMTErrorToneId
 SIMTCallWaitingToneId
 SIMTRingingToneMTId

User Defined Tones:

Tone defined with AT#UDTSET

Dial tones:

DialToneId

Notes

- The class DTMF Tones (<class>=16) refers only to the volume for locally generated DTMF tones. It does not affect the level of the DTMF generated by the network as result of AT+VTS command.

Examples

```
AT#TSVOL=64,1,5
```

```
OK
```

```
AT#TSVOL?
```

```
#TSVOL:1,0
```

```
#TSVOL:2,0
```

```
#TSVOL:4,1,5
```

```
#TSVOL:8,0
```

```
#TSVOL:16,1,5
```

```
#TSVOL:32,0
```

```
#TSVOL:64,1,5
```

```
#TSVOL:128,0
```

```
OK
```

User Defined Tone SET #UDTSET command

Set command sets frequency and amplitude composition for a user-defined tone.

Read command returns the current settings for the tones:

```
#UDTSET: G,<F1>,<A1>,<F2>,<A2>,<F3>,<A3>
```

```
#UDTSET: H,<F1>,<A1>,<F2>,<A2>,<F3>,<A3>
```

```
#UDTSET: I,<F1>,<A1>,<F2>,<A2>,<F3>,<A3>
```

```
#UDTSET: J,<F1>,<A1>,<F2>,<A2>,<F3>,<A3>
```

#UDTSET: K, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>

#UDTSET: L, <F1>,<A1>,<F2>,<A2>,<F3>,<A3>

Test command returns the supported range of values for <tone>, <Fi> and <Ai>.

Syntax

Command	Command type
AT#UDTSET=<tone> ,<F1>,<A1>[,<F2>,<A2>[,<F3>,<A3>]]	Set
AT#UDTSET?	Read
AT#UDTSET=?	Test

Parameters and Values

<tone>	Tone index (G,H,I,J,K,L).
<Fi>	Frequency in Hz. Range: (300,3000) in step of 1 Hz.
<Ai>	Amplitude in dB. Range: (10,100) in step of 1 dB.

Notes

- Ai = 100 is equal to the maximum value of the single tone. Lower values attenuate output to the difference between 100 and the selected amplitude (ex: Ai = 80 is equal to 100-80 = -20dB).
- Issuing AT&F1 or AT&Z has the effect to set the parameters with the last saved in non-volatile memory values
- Ai = 0 and Fi = 0 are only values for uninitialized parameters and cannot be issued by AT command. Every time the set command is issued, the unspecified parameters are automatically reset to zero.
- (Ai,Fi) issuing needs also (Aj,Fj) with j<i.

User Defined Tone SAVE #UDTSAV command

Execute command saves the actual values of frequency and amplitude that are set with #UDTSET.

Test command returns the OK result code.

Syntax

Command	Command type
AT#UDTSAV	Execute
AT#UDTSAV=?	Test

Examples

Current tones are saved in non-volatile memory.

```
AT#UDTSAV
```

```
OK
```

User Defined Tone Reset **#UDTRST** command

Execute command resets to default values for frequency and amplitude, which you can set by using #UDTSET.

Test command returns the OK result code.

Syntax

Command	Command type
AT#UDTRST	Execute
AT#UDTRST=?	Test

Examples

The default value tones are restored in non-volatile memory.

```
AT#UDTRST
```

```
OK
```

Audio Profile Commands

Audio Profile Selection #PSEL

Set command selects the active audio profile.

The read command returns the active profile in the format:

#PSEL:<prof>

Test command returns the supported values range of <prof>.

Syntax

Command	Command type
AT#PSEL=<prof>	Set
AT#PSEL?	Read
AT#PSEL=?	Test

Parameters and Values

<prof>	Current profile.
0	Standard profile.
1-3	Extended profile, modifiable.

Notes

- To save <prof> value in non-volatile memory, use the AT&W command.

Audio Profile Configuration Save #PSAV

Execute command saves the actual audio parameters in the non-volatile memory of the device. Saving is not allowed if active audio profile is 0. The audio parameters to store are:

- Microphone line gain
- Earpiece line gain
- Side tone gain
- LMS adaptation speed (step size)
- LMS filter length (number of coefficients)
- Speaker to micro signal power relation
- Noise reduction max attenuation
- Noise reduction weighting factor (band 300-500Hz)
- Noise reduction weighting factor (band 500-4000Hz)
- AGC Additional attenuation
- AGC minimal attenuation
- AGC maximal attenuation
- Uplink path biquad filters
- Downlink path biquad filters

Test command returns the OK result code.

Syntax

Command	Command type
AT#PSAV	Execute
AT#PSAV=?	Test

Example

Current audio profile saved in non-volatile memory.

```
AT#PSAV
```

```
OK
```

Audio Profile Factory Configuration #PRST

Execute command resets the actual audio parameters in the non-volatile memory of the device to the default set. It is not allowed if active audio profile is 0. The audio parameters reset are:

- Microphone line gain
- Earpiece line gain
- Side tone gain
- LMS adaptation speed (step size)
- LMS filter length (number of coefficients)
- Speaker to micro signal power relation
- Noise reduction max attenuation
- Noise reduction weighting factor (band 300-500Hz)
- Noise reduction weighting factor (band 500-4000Hz)
- AGC additional attenuation
- AGC minimal attenuation
- AGC maximal attenuation

Test command returns the OK result code.

Syntax

Command	Command type
AT#PRST	Execute
AT#PRST=?	Test

Example

Current audio profile reset.

```
AT#PRST
```

```
OK
```

Audio Filter Commands

Uplink Path Biquad Filters #BIQUADIN

Set command allows to configure the parameters of the two cascaded digital biquad filters

$$H_{First}(z) \cdot H_{Second}(z)$$

in Uplink path (sending). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

#BIQUADIN: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

It is not allowed if active audio profile is 0.

Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>

Syntax

Command	Command type
AT#BIQUADIN=<aF0>[,<aF1>[,<aF2>[,<bF1>[,<bF2>[,<aS0>[,<aS1>[,<aS2>[,<bS1>[,<bS2>]]]]]]]]]	Set
AT#BIQUADIN?	Read
AT#BIQUADIN=?	Test

Parameters and Values

<aFn>,<bFn>,<aSn>,<bSn>

They all are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15).

Note: In the formulas pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>.

Parameters can be saved in non-volatile memory using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Extended Uplink Biquad Filters #BIQUADINEX

Set command allows to configure the parameters of the two extended digital biquad filters $H_{First}(z) \cdot H_{Second}(z)$ in Uplink path (sending). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

#BIQUADINEX: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.

Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>

Syntax

Command	Command type
AT#BIQUADINEX=<aF0>[,<aF1>[,<aF2>[,<bF1>[,<bF2>[,<aS0>[,<aS1>[,<aS2>[,<bS1>[,<bS2>]]]]]]]]]	Set
AT#BIQUADINEX?	Read
AT#BIQUADINEX=?	Test

Parameters and Values

<char>

<aFn>,<bFn>,<aSn>,<bSn> - they all are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15)

Note: In the above formulas pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>

Parameters can be saved in non-volatile memory using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Cascaded Filters #BIQUADOUT

Set command allows to configure the parameters of the two cascaded digital biquad filters $H_{First}(z) \cdot H_{Second}(z)$ in Downlink path (receiving). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

BIQUADOUT: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

It is not allowed if active audio profile is 0.

Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>

Syntax

Command	Command type
AT#BIQUADOUT=<aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>]]]]]]]]]]	Set
AT#BIQUADOUT?	Read
AT#BIQUADOUT=?	Test

Parameters and Values

<aFn>,<bFn>,<aSn>,<bSn> All are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15).

Note: In the formulas, pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>

Parameters can be saved in non-volatile memory using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Extended Downlink Biquad Filters #BIQUADOUTEX

Set command allows to configure the parameters of the two extended digital biquad filters $H_{First}(z) \cdot H_{Second}(z)$ in Downlink path (receiving). It is not allowed if active audio profile is 0.

Read command returns the parameters for the active profile in the format:

#BIQUADOUTEX: <aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>

Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.

Test command returns the supported range of values for <aF0>, <aF1>, <aF2>, <bF1>, <bF2>, <aS0>, <aS1>, <aS2>, <bS1>, <bS2>.

Syntax

Command	Command type
AT#BIQUADOUTEX=<aF0>,<aF1>,<aF2>,<bF1>,<bF2>,<aS0>,<aS1>,<aS2>,<bS1>,<bS2>]]]]]]]]]]	Set
AT#BIQUADOUTEX?	Read
AT#BIQUADOUTEX=?	Test

Parameters and Values

<aFn>,<bFn>,<aSn>,<bSn> All are specific parameters for the calculation of digital biquad filters as follows:

$$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

$$H_s(z) = \frac{a_{s0} + 2 \cdot a_{s1} \cdot z^{-1} + a_{s2} \cdot z^{-2}}{1 + 2 \cdot b_{s1} \cdot z^{-1} + b_{s2} \cdot z^{-2}}$$

-32768-32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15).

Note: In the formulas pay attention to the multiplier (2) for parameters <aF1>, <aS1>, <bF1> and <bS1>

Parameters can be saved in non-volatile memory using AT#.PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

Audio Profile Setting #PSET

Set command sets parameters for the active audio profile. It is not allowed if the active audio profile is 0.

Read command returns the active profile in the format:

```
#PSET:<scal_in>,<scal_out>,<side_tone_atten>,<adaption_speed>,<filter_length>,<rxtxrelation>,<nr_atten>,<nr_w_0>,<nr_w_1>,<add_atten>,<min_atten>,<max_atten>
```

Test command returns the supported range of values for audio parameters.

Syntax

Command	Command type
AT#PSET=<scal_in>[,<scal_out>[,<side_tone_atten>[,<adaption_speed>[,<filter_length>[,<rxtxrelation>[,<nr_atten>[,<nr_w_0>[,<nr_w_1>[,<add_atten>[,<min_atten>[,<max_atten>]]]]]]]]]]]	Set
AT#PSET?	Read
AT#PSET=?	Test

Parameters and Values

<scal_in> -6-6	Microphone line digital gain (unused).
<scal_out> -6-6	Earpiece line digital gain (unused).
<side_tone_atten> -1-24	Side tone attenuation (unused).
<adaption_speed> 0-2	LMS adaptation speed.
<filter_length> 10-50	LMS filter length (number of coefficients).
<rxtxrelation> -90-90	Speaker to micro signal power (unused).
<nr_atten > 6-42	Noise reduction max attenuation (unused).
<nr_w_0> 0-9	Noise reduction weighting factor (band 300-500Hz) (unused).
<nr_w_1> 0-9	Noise reduction weighting factor (band 500-4000Hz) (unused).
<add_atten> 0-90	AGC additional attenuation (unused).

- <min_atten>

0-90

AGC minimal attenuation (unused).
- <max_atten>

0-90

AGC maximal attenuation (unused).

Example

```
AT#PSET?
#PSET: 0,0,-1,1,20,-5,6,2,2,6,0,12
OK
AT#PSET=?
#PSET: (-6,6),(-6,6),(-1,24),(0,2),(10,50),(-
90,90),(6,42),(0,9),(0,9),(0,90),(0,90),(0,90)
OK
```

Handsfree Configuration #HFCFG

Set command configures the automatic gain control threshold for Double Talk detection and digital gain in uplink.

Read command reports the currently selected parameters, in the format:

```
#HFCFG: <agc_rtx_en>,<agc_rtx>,<hf_gain>
```

Test command returns the supported range of values of all parameters.

Syntax

Command	Command type
AT#HFCFG=<agc_rtx_en>,<agc_rtx>,<hf_gain>	Set
AT#HFCFG?	Read
AT#HFCFG=?	Test

Parameters and Values

- <agc_rtx_en>

0

Disables different threshold for automatic gain control.
- 1

Enables different threshold automatic gain control.
- <agc_rtx>

-960...960

Parameter that specifies the threshold for automatic gain control.
- <hf_gain>

0

Disables +18dB of gain in uplink path.
- 1

Enables +18dB of gain in uplink path.

Notes

- If the active audio profile is 0, then an ERROR is returned. If active audio profile is not 0, then the default value for all the parameters is 0.
- To avoid saturation, only enable digital gain in the uplink path after reducing other analog/digital gains by the same amount.
- The digital gain in uplink path should be enabled only reducing by the same amount the other analog/digital gains to avoid saturation.

TX Noise Injector Configuration #TXCNI

Set command enables and configures comfort noise injector embedded.

Read command reports the currently selected parameters in the format:

#TXCNI: <support>,<gain>,<floor>

If active audio profile is 0, then an ERROR is returned. If active audio profile is different from 0, then the default value for all the parameters is 0.

Test command returns the supported value range of all parameter.

Syntax

Command	Command type
AT#TXCNI =<support>,<gain>,<floor>	Set
AT#TXCNI?	Read
AT#TXCNI=?	Test

Parameters and Values

<support>

- 0** Disables TXCNI.
- 1** Enables TXCNI.

<gain>

- 0-32767** Gain value of noise injected.

<floor>

- 0-32767** Floor value of noise injected.

Notes

- If active audio profile is 0, an error is returned.

Handsfree Echo Canceller #SHFEC

This command has no effect and is included for backward compatibility.

Read command reports the value of <mode>, in the format:

#SHFEC: <mode>

Test command returns the supported range of values of <mode>.

Syntax

Command	Command type
AT#SHFEC=[<mode>]	Set
AT#SHFEC?	Read
AT#SHFEC=?	Test

Parameters and Values

<mode>

- 0** Disables echo canceller for handsfree mode. **Default: 0.**
- 1** Enables echo canceller for handsfree mode.

Notes

- Value returns to default after power off.

Handset Echo Canceller #SHSEC

Set command enables or disables the echo canceller function on audio handset output.

Read command reports whether the echo canceller function on audio handset output is currently enabled or not, in the format:

#SHSEC: <mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#SHSEC =<mode>	Set
AT#SHSEC?	Read
AT#SHSEC=?	Test

Parameters and Values

<mode>

- 0** Disables echo canceller for handset mode. **Default: 0.**
- 1** Enables echo canceller for handset mode.

Notes

- To save <mode> value in non-volatile memory use the AT&W command.

Echo Reducer Configuration #ECHOCFG

Set command writes values in echo reducer parameters. It is not allowed if active audio profile is 0.

Read command reports the currently set parameters in the format:

#ECHOCFG: <par_1><par2>...<parN>

<par_i>:

Full set of registers values dumped in hexadecimal form, 39 words (156 characters).

It is not allowed if active audio profile is 0.

Test command returns the supported range of values for all parameters, in the format:

#ECHOCFG: <i>, (<low_i>-<high_i>)

where:

<i>	Parameter index.
<low_i>	Lower limit of <par_i>.
<high_i>	High limit of <par_i>.

Syntax

Command	Command type
AT#ECHOCFG=<par_1>[,<par_2>[,...,<par_N>]]	Set
AT#ECHOCFG?	Read
AT#ECHOCFG=?	Test

Parameters and Values

<par_1>	
0	Configure all parameters, module awaits 39 values.
1, 2, ...,39	Configure single parameters, module awaits 1 value.
<par_2>	With i = {2;N}
1, 2, ...,39	Configure single parameters, module awaits 1 value.
	After '>' to complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex).
	Data shall be written in Hexadecimal Form with 4 digits for every <par_i> value provided by set command.
	If data are successfully sent, then the response is OK.
	If data sending fails for some reason, an error code is reported.

Handset Automatic Gain Control #SHSAGC

Set command enables or disables the automatic gain control function on audio handset input.

Read command reports whether the automatic gain control function on audio handset input is currently enabled or not, in the format:

#SHSAGC: <mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#SHSAGC=<mode>	Set
AT#SHSAGC?	Read
AT#SHSAGC=?	Test

Parameters and Values

<mode>

0

Disables automatic gain control for handset mode. **Default: 0.**

1

Enables automatic gain control for handset mode.

Note: This parameter is saved in non-volatile memory issuing AT&W command.

Handset Noise Reduction #SHSNR

Set command enables or disables the noise reduction function on audio handset input.

Read command reports whether the noise reduction function on audio handset input is currently enabled or not, in the format:

SHSNR: <mode>

Test command returns the supported range of values for <mode>.

Syntax

Command	Command type
AT#SHSNR=<mode>	Set
AT#SHSNR?	Read
AT#SHSNR=?	Test

Parameters and Values

<mode>

0

Disables noise reduction for handset mode. **Default: 0.**

1

Enables noise reduction for handset mode.

Notes

- To save the value of <mode> use the AT&W command.

Handsfree Automatic Gain Control #SHFAGC

Set command enables/disables the automatic gain control function on audio handsfree input.

Read command returns the active profile in the format:

#SHFAGC:<mode>

Test command returns the supported range of values of parameter <prof>.

Syntax

Command	Command type
AT#SHFAGC=<mode>	Set
AT#SHFAGC?	Read
AT#SHFAGC=?	Test

Parameters and Values

<mode>

- | | |
|---|--|
| 0 | Disables automatic gain control for handsfree mode. Default: 0. |
| 1 | Enables automatic gain control for handsfree mode. |

Notes

- To save <mode> in non-volatile memory, use the AT&W command.

Handsfree Noise Reduction #SHFNR

Set command enables/disables the noise reduction function on audio handsfree input.

Read command returns the active profile in the format:

#SHFNR:<mode>

Test command returns the supported range of values of <mode>.

Syntax

Command	Command type
AT#SHFNR=<mode>	Set
AT#SHFNR?	Read
AT#SHFNR=?	Test

Parameters and Values

<mode>

- | | |
|---|---|
| 0 | Disables noise reduction for handsfree mode. Default: 0. |
| 1 | Enables noise reduction for handsfree mode. |

Notes

- To save <mode> value in non-volatile memory, use the AT&W command.

Embedded DTMF Decoder Commands

Embedded DTMF Decoder Enabling #DTMF

Set command enables or disables the embedded DTMF decoder.

Read command reports the currently selected <mode> in the format:

#DTMF: <mode>

Test command reports supported range of values for all parameters.

Syntax

Command	Command type
AT#DTMF=<mode>	Set
AT#DTMF?	Read
AT#DTMF=?	Test

Parameters and Values

<mode>

- | | |
|----------|--|
| 0 | Disable DTMF decoder. Default: 0. |
| 1 | Enables DTMF decoder. |
| 2 | Enables DTMF decoder without URC notify. |
| 3 | Enables enhanced DTMF decoder. |

Notes

- If <mode>=1, the receiving of a DTMF tone is pointed out with an unsolicited message through AT interface in the following format:
#DTMFEV: x with x as the DTMF digit
- Ensure the duration of a tone is not less than 50ms.
- The value set by command is not saved. A software or hardware reset restores the default value.
- To store the value in non-volatile memory, use profiles.
- When DTMF decoder is enabled, PCM playing and recording are automatically disabled. AT#SPCM returns error.

Embedded DTMF Decoder Configuration #DTMFCFG

Set command configures the embedded DTMF decoder.

Read command reports the currently selected <scaling>, <threshold> in the format:

#DTMFCFG: <scaling>,<threshold_1>,<threshold_2>

Test command reports supported range of values for all parameters.

Syntax

Command	Command type
AT#DTMFCFG=<mode>	Set
AT#DTMFCFG?	Read
AT#DTMFCFG=?	Test

Parameters and Values

<scaling>	The scaling applied to pcm samples to manage arithmetic operations.
3..11	Default: 7.
<threshold_1>	The numeric threshold used to detect DTMF tones.
1000..20000	Default: 2500.
<threshold_2>	The numeric threshold used to detect DTMF decoding.
1000..20000	Default: 1500.

Notes

- Default values were chosen after fine tuning. Change these values carefully to avoid wrong decoding.
- Values set by this command are not saved. A software or hardware reset restores the default value.
- Default values are referred to standard DMTF decoder (AT#DTMF=1).

Digital Voice Interface

Digital Voiceband Interface #DVI

Set command enables or disables the Digital Voiceband Interface.

Read command reports last setting, in the format:

```
#DVI: <mode>,<dviport>,<clockmode>
```

Test command reports the range of supported values for <mode>,<dviport> and <clockmode>.

Syntax

Command	Command type
AT#DVI=<mode>[,<dviport>,<clockmode>]	Set
AT#DVI?	Read
AT#DVI=?	Test

Parameters and Values

- <mode>

0

1

2

Enables or disables the DVI.

Disable DVI.

Enable DVI; audio is forwarded to the DVI block.

Reserved.
- <dviport>

1

DVI port 1

Default: 1.
- <clockmode>

0

1

DVI slave.

DVI master. Default: 1.

Example

Both analog and DVI activated for audio.DVI is configured as master providing on DVI Port 2, the only port available.

```
AT#DVI=2,1,1
OK
```

Miscellaneous Commands

PCM Play and Receive #SPCM

Execute command allows user either to send speech sample coming from microphone and/or downlink audio channel to serial port, or to reproduce a PCM coming from serial port to speaker and/or uplink audio channel; both modes are also available during speech calls.

Test command returns the supported range of values for <mode> and <dir>.

#SPCM: <mode>,<dir>

Syntax

Command	Command type
AT#SPCM=<mode>,<dir>	Execute
AT#SPCM=?	Test

Parameters and Values

<mode>	Action to execute.
1	Reproduce PCM stream from serial to selected path.
2	Send speech from selected path to serial.
<dir>	Select the audio path.
0	Send/receive to/from analog front end.
1	Send/receive to/from audio channel.
2	Reserved.

Notes

- Execute command switches module in online mode. Module moves back to command mode either after entering the escape sequence +++ or as a consequence of a DTR transition.
- If you are using 16 bit, you must set +IPR at least to 230400.

The following table summarizes the status of audio path during a speech call for different configurations and with sidetone disabled:

	mode = 1	mode = 2
dir = 0	Uplink off. Downlink on. PCM stream on speaker.	Uplink off. Downlink off. PCM stream from microphone.
dir = 1	Uplink on. Downlink off. PCM stream on uplink.	Uplink off. Downlink off. PCM stream from downlink.

Sidetone is active for default.

Examples

```
AT#SPCM=1 , 0
CONNECT
+++
NO CARRIER

Note: After CONNECT, PCM stream has to be sent to serial port

AT#SPCM=2 , 0
CONNECT
+++
NO CARRIER

Note: After CONNECT, PCM stream can be read from serial port.
```

TeleType Writer #TTY

Set command enables or disables the TTY feature.

Read command returns whether the TTY function is currently enabled or not, in the format:

#TTY: <support>

Test command reports the supported range of values for <support>.

Syntax

Command	Command type
AT#TTY=<support>	Set
AT#TTY?	Read
AT#TTY=?	Test

Parameters and Values

- <support>
- 0

Disable TTY function **Default: 0.**
- 1

Enable TTY function.

Emergency Call and eCall Management

Dial an Emergency Call #EMRGD

Command initiates and emergency call.

Execute command initiates an emergency call.

Read command reports the emergency numbers received from the network (Rel5 feature) and the associated service categories in the format:

```
[#EMRGD: <num1>[,<par1>,<serv>[,<serv>..,<serv>]]]
```

```
[#EMRGD: <numn>[,<parn>,<serv>[,<serv>..,<serv>]]]
```

where:

<numn>	Is the emergency number (that can be dialed with ATD command).
<parn>	
1..31	1..31 - sum of integers each representing a specific Emergency Service.
1	Police.
2	Ambulance.
4	Fire Brigade.
8	Marine Guard.
16	Mountain Rescue.
32	Manually initiated eCall (if eCall is supported, Rel8 feature).
64	Automatically initiated eCall (if eCall is supported, Rel8 feature).

When the emergency call can initiate, an indication of the selected Service Category is shown before the OK in the following format:

```
#EMRGD: <serv>[,<serv>..,<serv>]
```

where:

<serv>	"Police"
	"Ambul"
	"FireBrig"
	"MarineGuard"
	"MountRescue"
	"MleC"
	"AleC"

Test command reports the supported range of values for <par>.

If eCall is supported

0-32,64

If eCall is not supported

0-31

Syntax

Command	Command type
AT#EMRGD[=<par>]	
AT#EMRGD	Execute
AT#EMRGD?	Read
AT#EMRGD=?	Test

Parameters and Values

<par>	1..31 - sum of integers each representing a specific Emergency Service. Also 32,64 if eCall is supported.
0	Initiates an emergency call without specifying the service category. Default: 0.
1..31	1..31 - sum of integers each representing a specific Emergency Service. 1 Police. 2 Ambulance. 4 Fire Brigade. 8 Marine Guard. 16 Mountain Rescue.
32	Manually initiated eCall (if eCall is supported, Rel8 feature).
64	Automatically initiated eCall (if eCall is supported, Rel8 feature).

Example

```
AT#EMRGD?
#EMRGD: 123,2,"Ambul"
#EMRGD: 910,5,"Police","FireBrig"
OK
```

SSL Commands

Configure SSL Socket General Parameters #SSLCFG

Set command configures the SSL connection parameter.

Read command reports the currently selected parameters, in the format:

```
#SSLCFG: <SSId>,<cid>,<pktSz>,<maxTo>,<defTo><txTo>,0,0,0,0
```

Test command reports the support value range for all the parameters.

```
#SSLCFG: (1),(1),(0-1500),(0-65535),(10-5000),(0-255),(0),(0),(0),(0)
```

Syntax

Command	Command type
AT#SSLCFG=<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>[,<UNUSED_4>]]]]	Set
AT#SSLCFG?	Read
AT#SSLCFG=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<cid>	PDP Context manager.
1	Currently only context one is supported.
<pktSz>	Packet sized used by the SSL/TCP/IP stack when sending data.
0	Select default value automatically (300).
1..1500	Packet size in bytes.
<maxTo>	Exchange timeout (or socket inactivity timeout). In online mode, if there's no data exchange within this timeout period the connection is closed.
0	No timeout.
1..65535	Timeout value in seconds. Default: 90.
<defTo>	Timeout that will be used by default whenever the corresponding parameter of each command is not set.
10...5000	Timeout in tenth of seconds. Default: 100.
<txTo>	Data sending timeout. In online mode after this period, data is sent also if it is less than max packet size.
0	No timeout.
1..255	Timeout value in hundreds of milliseconds. Default: 50.

Notes

- If a secure socket is not enabled with #SSLEN, you can only send test requests. You can issue read command if at least <SSId> is enabled.
- These values are saved automatically to non-volatile memory.

Opening a Socket SSL to a Remote Server #SSLD

Execute command opens a remote connection via socket secured through SSL. Both command and online modes can be used. In command mode, OK displays on success and you can #SSLSEND and #SSLRCV commands to exchange data. In online mode, CONNECT displays and data can be sent/received directly to/by the serial port. Suspend communication by using the escape sequence (by default +++). Restore communication with #SSLO.

Test command reports the support value range for all the parameters.

#SSLD: (1),(1-65535),,(0,1),(0,1),(10-5000)

Syntax

Command	Command type
AT#SSLD=<SSId>,<rPort>,<IPAddress>,<ClosureType>[,<connMode>[,<Timeout>]]	Execute
AT#SSLD=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<rPort>	Remote TCP port to contact
1..65535	
<IPAddress>	String type, SSL server address.
<ClosureType>	How to close SSL socket.
0	SSL session id and keys are free then AT#SSLFASTD can't be used to recover the last SSL session [default]. Default: 0.
1	SSL session id and keys are saved and a new connection can be made without a complete handshake using AT#SSLFASTD.
<connMode>	Connection mode.
0	Online mode connection.
1	Command mode connection. Default: 1.
<Timeout>	Time-out in 100ms units. It represents the maximum allowed TCP inter-packet delay. It means that when more data is expected during the handshake, the module awaits <Timeout>*100msecs for the next packet. If no more data can be read, the module gives up the handshake and raises an ERROR response.
10..5000	Timeout value in hundreds of milliseconds. Default: 100.

Notes

- If a secure socket is not enabled with AT#SSLEN, you can only send test requests.
- If timeout is not set for SSL connection, the default timeout value set by AT#SSLCFG is used.
- In online mode, the socket is closed after an inactivity period (configurable with AT#SSLCFG, with a default value of 90 seconds) and NO CARRIER displays.
- In online mode, data are transmitted as soon as the data packet size is reached or after a transmission timeout. Both these parameters are configurable by using AT#SSLCFG.
- Before opening a SSL connection, use AT#SGACT=x,1 to activate the GPRS context.
- Before opening a SSL connection, use AT#SSLSECDATA to store the needed secure data (Certificate, CA certificate, private key) for the security level set through AT#SSLSECCFG.

Enabling a Socket SSL #SSLEN

Execute enables a socket secured by SSL.

Read command reports the currently enable status of secure socket in the format:

```
#SSLEN: <SSId>,<Enable><CR><LF>
```

```
<CR><LF>
```

```
OK
```

Test command reports the support value range for all the parameters.

```
#SSLEN: (1),(0,1)
```

Syntax

Command	Command type
AT#SSLEN=<SSId>,<Enable>	Execute
AT#SSLEN?	Read
AT#SSLEN=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<Enable>	
0	Deactivate secure socket. Default: 0.
1	Activates secure socket.

Notes

- If secure socket is not enabled, only test requests can be made for every SSL command except #SSLS (SSL status), which can be issued also if the socket is disabled.
- Read commands can be issued if at least an <SSId> is enabled.
- These values are automatically saved in non-volatile memory.
- An error is raised if #SSLEN=X,1 is issued when the socket 'X' is already enabled and if #SSLEN=X,0 is issued when the socket 'X' is already disabled.
- You cannot use #SSLEN=1 to disable an SSL socket if it is connected.

Fast Redial of an SSL Socket #SSLFASTD

Execute command restarts the last SSL connection without a complete handshake. It dials faster and with a lower TCP payload.

Read command reports the currently enable status of secure socket in the format:

```
#SSLEN: <SSId>,<Enable><CR><LF>
```

```
<CR><LF>
```

```
OK
```

Test command returns the support value range for all the parameters.

#SSLFASTD: (1),(0,1),(10-5000)

Syntax

Command	Command type
AT#SSLFASTD=<SSId>[,<connMode>[,<Timeout>]]	Execute
AT#SSLFASTD=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<connMode>	Connection mode.
0	Online mode connection.
1	Command mode connection. Default: 1.
<Timeout>	Timeout in 100 ms units. It represents the TCP inter-packet delay.
	Note: It does not represent the total handshake timeout.
10..5000	Hundreds of ms. Default: 1.

Notes

- If secure socket is not enabled with AT#SLEN, only test requests can be made.
- If timeout is not set for SSL connection, the default timeout value set by AT#SSLCFG is used.
- Before opening a SSL connection, activate a GPRS context with AT#SGACT=X,1.
- If an error occurs during reconnection, the socket cannot be reconnected. A new connection is required.
- If the remote server cleans SessionID cache before reconnecting, the full handshake will be made.
-

Close an SSL Socket #SSLH

Execute command closes the SSL connection.

Test command returns the support value range for all the parameters.

#SSLH: (1),(0,1)

Syntax

Command	Command type
AT#SSLH=<SSId>[,<ClosureType>]	Execute
AT#SSLH=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<ClosureType>	How to close the SSL socket.
0	SSL session ID and keys are free and AT#SSLFASTD cannot be used to recover the last SSL session.
1	SSL session ID and keys are saved and a new connection can be made without a complete handshake using AT#SSLFASTD.

Notes

- If secure socket is not enabled with AT#SLEN, only test requests can be made.
- In client side, if <ClosureType> is not set, the value set into AT#SSLD is used.

Restore an SSL Socket after a +++ #SSLO

Execute command restores an SSL connection (online mode) suspended by an escape sequence (+++). After the connection is restored, CONNECT displays.

Note: This is possible even if the connects was started in the command mode (#SSLD with <connMode> parameter set to 1).

Test command returns the support value range for all the parameters.

#SSLO: (1)

Syntax

Command	Command type
AT#SSLO=<SSId>	Execute
AT#SSLO=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.

Notes

- If secure socket is not enabled with AT#SLEN, only test requests can be made.
- Before opening a SSL connection, activate a GPRS context with AT#SGACT=X,1.
- If an error occurs during reconnection, the socket cannot be reconnected. A new connection is required.

Read Data from an SSL Socket #SSLRCV

Execute command allows receiving data from a secure socket.

If no data are received the device responds:

#SSLRCV: 0<CR><LF>

TIMEOUT<CR><LF>

<CR><LF>

OK

If the remote host closes the connection the device responds:

```
#SSLRCV: 0<CR><LF>
DISCONNECTED<CR><LF>
<CR><LF>
OK
```

If data are received the device responds:

```
#SSLRCV: NumByteRead<CR><LF>
...(Data read)... <CR><LF>
<CR><LF>
OK
```

Test command returns the support value range for all the parameters.

```
#SSLRCV: (1),(1-1000),(10-5000)
```

Syntax

Command	Command type
AT#SSLRCV=<SSId>,<MaxNumByte>[,<Timeout>]	Execute
AT#SSLRCV=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<MaxNumByte>	Maximum number of bytes to read
1..1000	
<Timeout>	Timeout in 100 ms units.
10..5000	Hundreds of ms. Default: 100.

Notes

- If secure socket is not enabled with AT#SSLEN, only test requests can be made.
- If timeout is not set for SSL connection, the default timeout value set by AT#SSLCFG is used.
- Before receiving data from the SSL connection, use AT#SSLD to open a connection.

Reporting the status of an SSL Socket #SSLS

Execute command report a secure socket status.

If a secure socket is connected, the device responds to the command:

```
#SSLS: <SSId>,2,<CipherSuite>
```

Otherwise:

```
#SSLS: <SSId>,<ConnectionStatus>
```

where:

<ConnectionStatus>	Available values are:
0	Socket disabled.
1	Connection closed.
2	Connection open.

Test command returns the support value range for all the parameters.

```
#SSLS: (1)
```

Syntax

Command	Command type
AT#SSLS=<SSId>	Execute
AT#SSLS=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.

Notes

- You can issue this command even if the <SSId> is not enabled.

Configure Security Parameters SSL Socket #SSLSECCFG

Execute command you to configure SSL connection parameters.

Read command reports the currently selected parameters, in the format:

```
#SSLSECCFG: <SSId1>,<CipherSuite>,<SecLevel>
```

Test command returns the support value range for all the parameters.

```
#SSLSECCFG: (1),(0-2),(0-2)
```

Syntax

Command	Command type
AT#SSLSECCFG=<SSId>,<CipherSuite>,<SecLevel>	Execute
AT#SSLSECCFG?	Read
AT#SSLSECCFG=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<CipherSuite>	
0	Remote server chooses CipherSuite. Default: 0.
1	SSL_RSA_WITH_RC4_128_MD5
2	SSL_RSA_WITH_RC4_128_SHA
3	TLS_RSA_WITH_AES_256_CBC_SHA
<SecLevel>	
0	No authentication. Default: 0.
1	Manage server authentication.
2	If requested by the remote server, manage server and client authentication.

Notes

- If no authentication is set, security data is not needed (Client certificate, Server CA certificate and Client private key).
- If only server authentication is managed, then the Server CA certificate has to be stored through AT#SSLSECDATA.
- If server and client authentication are managed, then the client certificate and private key, and server CA certificate have to be stored through AT#SSLSECDATA. Private keys with password are not supported.
- Only “rsa_sign” certificates are supported by the G3 in client authentication. The remote server must support this certificate type or the handshake will fail.
- If secure socket is not enabled using #SSLEN, only test requests can be made. Read command can be issued if at least a <SSId> is enabled.
- These values are automatically saved in non-volatile memory.

Managing Security Data #SSLSECDATA

Set command allows you to store, delete, and ready security data (Certificate, CA certificate, private key) in non-volatile memory.

Read command reports what security data are stored, in the format:

```
#SSLSECDATA: <SSId 1>,<CertIsSet>,<CAcertIsSet>,<PrivKeysIsSet>
```

If storing related data in non-volatile memory, <CertIsSet>,<CAcertIsSet>,<PrivKeysIsSet> are 1. Otherwise these are 0.

Test command returns the supported value range for all the parameters.

```
#SSLSECDATA: (1),(0-2),(0-2),(1-2047)
```

Syntax

Command	Command type
AT#SSLSECDATA=<SSId>,<Action>,<DataType>[,<Size>]	Set
AT#SSLSECDATA?	Read
AT#SSLSECDATA=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<Action>	Desired action.
0	Delete data from non-volatile memory.
1	Store data from non-volatile memory.
2	Read data from non-volatile memory.
<DataType>	
0	Certificate.
1	CA certificate.
2	RSA private key.
<Size>	Size of security data to be stored.
1-2047	

Notes

- Use AT#SSLLEN to enable the secure socket or you can only make test requests.
- If <Action> =1, the device responds to the command with the prompt, >, and waits for the data to store.
- To complete the operation, send Ctrl-Z (0x 1A hex) to exit without writing the message send ESC (0x 1B hex).
- If data successfully stores, the response is OK. If it fails, an error code is reported.
- If <Action>=2, data specified by <DataType> is shown in the following format:

```
#SSLSECDATA: <connId>,<DataType>
<DATA>
OK
```

If <DataType> data has not been stored or has been deleted, the response is shown in the following format:

```
#SSLSECDATA: <connId>,<DataType>
No data stored.
OK
```

- Use PEM format for secured data.
- Private keys with passwords are not supported.
- Only rsa_sign certificates are supported in client authentication. If the remote server does not support this certificate type, the handshake will fail.
- If issuing a write <action>, <size> is mandatory. For delete or read actions, omit <size>.
- If socket is connected, an error code is reported.

Sending Data through an SSL Socket #SSLSEND

Set command allows you to send data through a secure socket.

Test command returns the supported value range for all parameters.

#SSLSEND: (1),(10-5000)

Syntax

Command	Command type
AT#SSLSEND=<SSId>,<Action>,<DataType>[,<Size>]	Set
AT#SSLSEND=?	Test

Parameters and Values

<SSId>	Secure Socket Identifier.
1	Currently SSL block manages only one socket.
<Timeout>	Socket send timeout.
10-5000	Hundreds of ms. Default: 100.

Notes

- Use AT#SSLEN to enable the secure socket or you can only make test requests.
- If the device responds to the command with the prompt, >, and waits for the data to send.
- To complete the operation, send Ctrl-Z (0x 1A hex) to exit without writing the message send ESC (0x 1B hex).
- If data sends successfully, the response is OK. If data sending fails, an error
- If data sends successfully, the response is OK. If it fails, an error code is reported.
- Send up to 1023 bytes. Additional data is discarded and lost.

AT Parser Abort

The following AT Command list can be aborted, while executing the AT Command:

- ATD
- ATA
- +CLCC
- +COPN
- +CLIP

Note:

- If DTE transmits any character before it receives a response to the issued AT Command, the AT Command aborts.

CME Error List

Mobile Equipment (ME) Error Result Code - +CME ERROR: <err>

+CME ERROR: <err> is NOT a command. Rather, it is the error response to +Cxxx 3GPP TS 27.007 commands.

Syntax

Command	Command type
+CME ERROR: <err>	This is not a command.

Parameters and Values

<err>	The error code can be numeric or verbose. See +CMEE.
Numeric format	Verbose format
0	Phone failure.
1	No connection to phone.
2	Phone-adaptor link reserved.
3	Operation not allowed.
4	Operation not supported.
5	PH-SIM PIN 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 timeout.
32	Network not allowed - emergency calls only.
40	Network personalization PIN required.
41	Network personalization PUK required.
42	Network subset personalization PIN required.
43	Network subset personalization PUK required.
44	Service provider personalization PIN required.
45	Service provider personalization PUK required.
46	Corporate personalization PIN required.

47 Corporate personalization PUK required.

General purpose error

100 Unknown.

GPRS related errors to a failure to perform an Attach:

103 Illegal MS (#3)*.

106 Illegal ME (#6)*.

107 GPRS service not allowed (#7)*.

111 PLMN not allowed (#11)*.

112 Location area not allowed (#12)*.

113 Roaming not allowed in this location area (#13)*.

*(values in parentheses are GSM 04.08 cause codes)

GPRS related errors to a failure to Activate a Context and others

132 Service option not supported (#32)*.

133 Requested service option not subscribed (#33)*.

134 Service option temporarily out of order (#34)*.

148 Unspecified GPRS error.

149 PDP authentication failure.

150 Invalid mobile class.

*(values in parentheses are GSM 04.08 cause codes)

IP Stack related errors

550 Generic undocumented error.

551 Wrong state.

552 Wrong mode.

553 Context already activated.

554 Stack already active.

555 Activation failed.

556 Context not opened.

557 Cannot setup socket.

558 Cannot resolve DN.

559 Timeout in opening socket.

560 Cannot open socket.

561 Remote disconnected or timeout.

562 Connection failed.

563 Tx error.

564 Already listening.

566 Cannot resume socket.

567 Wrong APN.

568 Wrong PDP.

569 Service not supported.

570 QOS not accepted.

571 NSAPI already used.

572 LLC or SMDCP failure.

573 Network reject.

Custom SIM Lock related errors

586 MCL personalization PIN required.

FTP related errors

600	Generic undocumented error.
601	Wrong state.
602	Cannot activate.
603	Cannot resolve name.
604	Cannot allocate control socket.
605	Cannot connect control socket.
606	Bad or no response from server.
607	Not connected.
608	Already connected.
609	Context down.
610	No photo available.
611	Cannot send photo.
612	Resource used by other instance.
613	Data socket yet opened in CmdMode
614	FTP CmdMode data socket closed.

Network survey errors

657	Network survey error (No Carrier)*
658	Network survey error (Busy)*
658	Network survey error (Wrong request)*
660	Network survey error (Aborted)*

SAP related errors

731	Unspecified.
732	Activation command is busy.
733	Activation started with CMUX off.
734	Activation started on invalid CMUX.
736	Remote SIM already active.
737	Invalid parameter.

SSL related errors

830	SSL generic error.
831	SSL cannot activate.
832	SSL socket error.
833	SSL not connected.
834	SSL already connected.
835	SSL already activated.
836	SSL not activated.
837	SSL cert and keys wrong or not stored.
838	SSL error end/dec data.
839	SSL error during handshake.
840	SSL disconnected.

PING related errors

900	Generic undocumented error
901	Timeout
902	Destination unreachable
903	Cannot resolve name
904	Context down

SiRF InstantFix related errors

- 920** SGEE update initialization stage failed.
- 921** SGEE file is not newer than the last stored one
- 922** SGEE update generic error

*(values in parentheses are GSM 04.08 cause codes)

CMS Error List

Message Service Failure Result Code - +CMS ERROR: <err>

This is not a command. It is the error response to +Cxxx 3GPP TS 27.005 commands.

Syntax

Command	Command type
+CMS ERROR: <err>	This is not a command.

Parameters and Values

<err>	Numeric error code.
0-127	GSM 04.11 Annex E-2 values.
128-255	3 GPP TS 23.040 sub clause 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.
331	No network service.
332	Network timeout.
340	Invalid transaction ID.
500	Unknown error.

Acronyms

AT	Attention command
BA	BCCH Allocation
BCCH	Broadcast Control Channel
CA	Cell Allocation
CLIR	Calling Line Identification Restriction
CTS	Clear To Send
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DNS	Domain Name System
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IRA	International Reference Alphabet
MO	Mobile Originated
MT	Mobile Terminated <i>or</i> Mobile Terminal
NVM	Non Volatile Memory
PDP	Packet Data Protocol
PDU	Packet Data Unit
PIN	Personal Identification Number
PPP	Point to Point Protocol
PUK	Pin Unblocking Code
RLP	Radio Link Protocol
RMC	Recommended minimum Specific data
RTS	Request To Send
SCA	Service Center Address
SMS	Short Message Service
SMSC	Short Message Service Center
SMTP	Simple Mail Transport Protocol
TA	Terminal Adapter
TCP	Transmission Control Protocol
TE	Terminal Equipment
UDP	User Datagram Protocol
UTC	Coordinated Universal Time
VTG	Course over ground and ground speed