HSPA-H4 AT Commands

AT Commands
Reference Guide

MultiTech Systems

High Speed HSPA-H4 AT Commands Reference Guide for the following products:
SocketModem® (MTSMC-H4)
MultiModem® iCell (MTCMR-H4)
MultiModem® rCell (MTCBA-H4-EN2)

PN S000483A

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Revisions

Revision Level	*Date*	*Description*
A	06/23/10	Initial release.

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Contents

Chapter 1 – Introduction 7
Escape Sequence Guard Time 7
Result Codes 7
Conventions 7
Summary of Modem-Specific AT Commands Described in This Document 8
Modem Status Commands, Customization, & Reset Commands 8
Diagnostic Command 9
SIM Commands 9
Summary of GSM/WCDMA Commands Described in This Document 10
ITU-T Recommendation V.250 AT Commands 10
ITU-T Recommendation 27.005 AT Commands 11
ITU-T Recommendation Supported 27.007 AT Commands 12

Chapter 2 – Modem-Specific Commands 15
Introduction 15
Modem Status, Customization, and Reset Commands 15
!BAND Select / Return Frequency Band Set 15
^CARDMODE Return SIM Card Mode (Card Type) 16
*CNTI Report Current, Available, and Supported Network Technologies 17
+CQI Enable/Disable/Return Averaged CQI Return 17
+ECIO Return Total Energy Per Chip Per Power Density Value 18
+ETFCI Enable/Disable/Return E-TFCI Average Value 18
!GETBAND Return the Current Active Band 19
!GETRAT Return the Current Active Radio Access Technology (RAT) 19
!GRELIMEI Return the Modem's Production TAC 19
!GSMINFO Return 2G Network Information 20
!GSTATUS Return Operational Status 21
!GVER Return the Firmware Version 23
^HVER Return the Modem Hardware Version 24
!PCTEMP Return Current Temperature Information 24
!PCVOLT Return Current Power Supply Voltage Information 25
!POWERDOWN Power Down System 25
!REL Return Active Protocol/Revision 26
!RESET Reset the Modem 26
!GRESET Reset the Modem 26
+RSCP Return Received Signal Code Power (RSCP) 27
!SCACT Activate/Deactivate PDP Context for FIFO Interface 27
!SCDFTPROF Set/Return Default Profile ID 28
!SCDNS Set/Return Profile ID DNS Address 28
!SCPADDR Return IP Address for Specified PDP Context 29
!SCPROF Set/Return SWI-Specific Profile Information 29
!SCPROFDEL Erase Profile Information 30
!SCWINS Set/Return Profile's WINS Addresses 30
!SDNOTINSTALLED Return SD Installation Status 30
!SELMODE Set/Return Current Service Domain 31
!SELRAT Set/Return Current Radio Access Technology (RAT) 31
!SMSRETRY Set/Return SMS Retry Period and Interval 32
!SMSSTSEN Enable/Disable SMS Status Reports 33
!SWICALLPROG Enable/Disable Call Progress Notification 33
^SYSCONFIG Set/Return System Configuration Information 35
^SYSINFO Return Service Status Information 36
!TIME Set/Return Current Time of Day 36
!UDINFO Return Information from Active USB Descriptor 37
+UPSC Return Primary Scrambling Code 38
+USET Return WCDMA Set Information 38
&V Return Operating Mode AT Configuration Parameters 39

Diagnostic Command....40
!MXSTATS Display/Clear 27.010 Statistics....40
SIM Commands....41
!AUTH Run GSM Algorithm on SIM....41
!ICCID Return (U)SIM Card's ICCID....41
!SPN Return (U)SIM Card's SPN....42

Chapter 3 – Supported GSM/WCDMA 3G AT Commands....43

Supported ITU-T Recommendation V.250 Commands....43
&D Set DTR Function Mode....43
&F Restore Factory Settings....44
&S Set DSR Signal....44
&T Auto-Tests....45
&V Display Configuration....46
&W Save Configuration....47
+DR V42bis Data Compression Report....47
+DS V42bis Data Compression....48
+GCAP Request Complete TA Capabilities List....49
+GMI Request Manufacturer Identification....49
+GMM Request TA Model Identification....49
+GMR Request Revision Identification....50
+GSN Product Serial Number....50
+ICF DTE-DCE Character Framing....51
+IFC DTE-DCE Local Data Flow Control....52
+IPR Set Fixed DTE Rate....53
A Answer Incoming Call....54
D Dial....54
D> Originate a Call to Phone Number in Current Memory....55
E Echo....56
H Disconnect Existing Connections....56
I Display Product Identification Information....57
O Switch from Command Mode to Data Mode....57
S0 Set Number of Rings Before Automatic Answer....57
S3 Set Command Line Termination Character....58
S4 Set Response Formatting Character....58
S5 Set Command Line Editing Character....58
S6 Set Pause Before Blind Dialing....59
S7 Set Number of Seconds to Wait for Connection Completion....59
S8 Set Number of Seconds to Wait When Comma Dial Modifier Is Used....59
S10 Automatic Disconnect Delay....60
T Select Tone Dialing....60
V Set Result Code Format Mode....60
X Set Connect Result Code Format and Call Monitoring....61
Z Set All Current Parameters to User-Defined Profile....61
Supported 27.005 Commands....62
+CBM Cell Broadcast Message Directly Displayed....62
+CDS SMS Status Report After Sending an SMS....62
+CDSI Incoming SMS Status Report....63
+CMGC Send an SMS....63
+CMGD Delete Message....64
+CMGF Message Format....65
+CMGL List Messages....65
+CMGR Read Message....67
+CMGS Send Message....69
+CMGW Write Message to Memory....70
+CMMS More Messages to Send....72
+CNMA New Message Acknowledgement to ME/TE....73
+CMS ERROR Message Service Failure Result Code....73
+CMSS Send Short Messages from Storage....74
+CMT Incoming Message Directly Displayed....74

+CMTI Incoming Message Stored in Memory 75
+CNMI New Message Indication 75
+CPMS Preferred Message Storage 76
+CSCA SMS Service Center Address 77
+CSCB Select Cell Broadcast Message Indication 78
+CSDH Show Text Mode Parameters 79
+CSMP Set Text Mode Parameters 79
+CSMS Select Message Service 81
Supported 3GPP TS 27.007 Commands 82
+CBST Bearer Type Selection 82
+CCFC Call Forwarding 83
+CCUG Closed User Group 84
+CCWA Call Waiting 85
+CFUN Set Phone Functionality 86
+CGACT PDP Context Activate or Deactivate 87
+CGATT GPRS Attach or Detach 88
+CGCLASS GPRS Mobile Station Class 88
+CGDATA Enter Data State 89
+CGDCONT Define PDP Context 89
+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable) 90
+CGEQREQ 3G Quality of Service Profile (Requested) 93
+CGEREP GPRS Event Reporting 96
+CGMI Manufacturer Identification 97
+CGMM Request Model Identification 98
+CGMR Request Revision Identification 98
+CGPADDR Show PDP Address 98
+CGREG GPRS Network Registration Status 99
+CGSMS Select Service for Mobile Originated SMS Messages 100
+CHLD Call Related Supplementary Services 101
+CHUP Hang Up Call 102
+CIMI Request IMSI 102
+CIND Indicator Control 103
+CLCK Facility Lock 104
+CLIP Calling Line Identification Presentation 105
+CLIR Calling Line Identification Restriction 106
+CLVL Loudspeaker Volume Level 107
+CME ERROR: <error> ME Error Result Codes: 108
+CMEE Report Mobile Equipment Errors 109
+CMER Mobile Equipment Event Reporting 109
+CMUT Microphone Mute Control 111
+CNUM Subscriber Number 112
+COLP Connected Line Identification Presentation 113
+COPN Read Operator Name 114
+COPS Operator Selection 114
+CPAS Phone Activity Status 116
+CPBF Find Phonebook Entries 117
+CPBR Read Phonebook Entries 119
+CPBS Select Phonebook Memory Storage 121
+CPBW Write Phonebook Entry 122
+CPIN Enter PIN 125
+CPOL Preferred Operator List 126
+CPUC Price Per Unit and Currency Table 128
+CPWD Change Password 128
+CR Service Reporting Control 129
+CRC Cellular Result Codes 130
+CREG Network Registration 131
+CRLP Radio Link Protocol Parameters 132
+CRSM Restricted SIM Access 133
+CSCS Select TE Character Set 134
+CSIM Generic SIM Access 135

+CSQ Signal Quality 136
+CSSN Supplementary Service Notifications 136
+CSTA Select Type of Address....138
+CUSD Unstructured Supplementary Service Data....138
D V.25 Dial Command....139

Appendix A – Test Frequencies / Channel Lists....140

Appendix B – HSDPA / HSUPA Categories....142

Appendix C – ASCII Table....143

Index....144

Chapter 1 – Introduction

This document describes standard and proprietary AT commands available for UMTS mobile broadband devices and intelligent embedded modules. Standard AT Commands are covered in Part 1 of this document. Proprietary AT commands are supplemental to the standard AT commands and are covered in Part 2 of this document.

Standard 3GPP AT commands for UMTS devices are described in the following 3GPP (3rd Generation Partnership Project) standards documents:

- *TS 27.007 AT command set for User Equipment (UE)*
- *TS 27.005 Use of Data Terminal Equipment -- Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (BSE)*

Some standard 3GPP commands are NOT supported, or are partially supported. These commands are identified in the *Table of Supported GSM/WCDMA AT Commands.*

Escape Sequence Guard Time

The AT escape sequence "+++" requires a guard time of 1.0 seconds before and after it is used.

Result Codes

Result codes are not shown in the command tables unless special conditions apply. Generally, the result code OK is returned when the command has been executed. ERROR may be returned if parameters are out of range and will be returned if the command is not recognized or is not permitted in the current state or condition of the modem.

Conventions

The following format conventions are used in this reference:

Character codes or keystrokes that are described with words or standard abbreviations are shown within angle brackets using a different font, such as <CR> for Carriage Return and <space> for a blank space character.

Numeric values are decimal unless prefixed as noted below.

Hexadecimal values are shown with a prefix of 0x, i.e. in the form 0x3D.

Binary values are shown with a prefix of 0b, i.e. in the form 0b00111101.

Command and register syntax is noted using an alternate font: !CHAN=<c>[,b]. The "AT" characters are not shown but must be included before all commands except as noted in the reference tables.

Characters that are required are shown in uppercase; parameters are noted in lowercase. Required parameters are enclosed in angle brackets (<n>) while optional parameters are enclosed within square brackets ([x]). The brackets are not to be included in the command string.

Commands are presented in table format. Each chapter covers the commands related to that subject and presents a summary table to help you locate a needed command. Commands are in ASCII alphabetical order in the body of each chapter.

Any default settings are noted in the command tables. Note that these are the factory default settings and not the default parameter value assumed if no parameter is specified.

Result Code. This is a numeric or text code that is returned after all commands (except resets)—text codes are returned if verbose responses are enabled. Only one result code is returned for a command line regardless of the number of individual commands contained on the line.

Response. This term indicates a response from the modem that is issued prior to a result code. Reading registers or issuing commands that report information will provide a response followed by a result code unless the command generates an error.

Responses and result codes from the modem, or host system software prompts, are shown in this font:

CONNECT 14400

Summary of Modem-Specific AT Commands Described in This Document

Modem Status Commands, Customization, & Reset Commands

These commands are described in Chapter 2.
They are used to determine modem status, to adjust customization settings, and to reset the modem.

Command	Description
!BAND	Select/return frequency band set
^CARDMODE	Return SIM card mode (card type)
*CNTI	Report current, available, and supported network technologies
+CQI	Enable/disable/return averaged CQI return (WCDMA only)
+ECIO	Return total Energy per chip per power density value (WCDMA only)
+ETFCI	Enable/disable/return E-TFCI average value
!GETBAND	Return the current active band
!GETRAT	Return the current active radio access technology (RAT)
!GRELIMEI	Return the modem's production
!GRESET !RESET	Reset the modem Reset the modem
!GSMINFO	Return 2G network information
!GSTATUS	Return operational status
!GVER	Return the firmware version
^HVER	Return the modem hardware version
!PCTEMP	Return current temperature information
!PCVOLT	Return current power supply voltage information
!POWERDOWN	Power down system
!REL	Return active protocol/revision
+RSCP	Return Received Signal Code Power (RSCP) (WCDMA only)
!SCACT	Activate/deactivate PDP context for FIFO interface
!SCDFTPROF	Set/return default profile ID
!SCDNS	Set/return profile ID DNS address
!SCPADDR	Return IP address for specified PDP context
!SCPROF	Set/return SWI-specific profile information
!SCPROFDEL	Erase profile information
!SCWINS	Set/return profile's WINS addresses
!SELMODE	Set/return current service domain
!SELRAT	Set/return current radio access technology (RAT)
!SIMNOTINSTALLED	Return SIM installation status
!SMSRETRY	Set/return SMS retry period and interval

Continued: Modem Status Commands, Customization, and Reset Commands

Command	Description
!SMSSTSEN	Enable/disable SMS status reports
!SWICALLPROG	Enable/disable Call Progress Notification
^SYSCONFIG	Set/return system configuration information
^SYSINFO	Return service status information
!TIME	Set/return current time of day
!UDINFO	Return information from active USB descriptor
+UPSC	Return Primary Scrambling Code (WCDMA only)
+USET	Return WCDMA set information
&V	Return Operating Mode AT Configuration Parameters

Diagnostic Command

This command is described in Chapter 2. It is used to select frequency bands and diagnose problems.

Command	Description
!MXSTATS	Display / clear 27.010 statistics

SIM Commands

These commands are described in Chapter 2. They communicate with an installed (U)SIM.

Command	Description
!AUTH	Run GSM algorithm on SIM
!ICCID	Return (U)SIM card's ICCID
!SPN	Return (U)SIM card's SPN

Summary of GSM/WCDMA Commands Described in This Document

The following AT Commands (ITU-T Recommendation V.250, 3GPP TS 27.005, and 3GPP TS 27.007) are supported on the Multi-Tech SocketModem Cell, SocketModem iCell, and MTSMC-H4 Embedded Cellular Modems. These commands are used to:

- Control serial communications over an asynchronous interface (ITU-T Recommendation V.250)
- Control SMS functions for devices on GSM/WCDMA networks (3GPP TS 27.005)
- Control devices operating on GSM/WCDMA networks (3GPP TS 27.007)

ITU-T Recommendation V.250 AT Commands

The table below indicates whether or not each command is supported on the H4 modems. Supported commands are described in Chapter 3.

Command	Description	Supported
&C	Set Data Carrier Detected (Received line signal detector) function mode	No
&D	Set Data Terminal Ready function mode	Yes
&F	Set all current parameters to manufacturer's defaults	Yes
&S	Set DSR signal	Yes
&T	Auto tests	No
&W	Store current parameter to user-defined profile	Yes
+DR	V42bis data compression report	Yes
+DS	V42bis data compression	Yes
+GCAP	Request complete TA capabilities list	Yes
+GMI	Request manufacturer identification	Yes
+GMM	Request TA model identification	Yes
+GMR	Request TA revision identification	Yes
+GOI	Request global object identification	No
+GSN	Request TA serial number identification	Yes
+ICF	Set TE-TA control character framing	Yes
+IFC	Set TE-TA local data flow control	Yes
+ILRR	Set TE-TA local rate reporting mode	No
+IPR	Set fixed local rate	Yes
A	Answer incoming call	Yes
D	Dial	Yes
D><MEM><N>	Originate call to phone number in memory <MEM>	No
D><N>	Originate call to phone number in current memory	Yes
D><STR>	Originate call to phone number in memory which corresponds to alphanumeric field <STR>	No
DL	Redial last telephone number used	No
E	Set command echo mode	Yes
H	Disconnect existing connections	Yes
I	Display product identification information	Yes
L	Set monitor speaker loudness	No
M	Set monitor speaker mode	No
O	Switch from command mode to data mode	Yes
P	Select pulse dialing	No

Continued: ITU-T Recommendation V.250 AT Commands

Q	Set Result code presentation mode	No
S0	Set number of rings before automatically answering the call	Yes
S10	Set disconnect delay after indicating the absence of data carrier	Yes
S3	Set command line termination character	Yes
S4	Set response formatting character	Yes
S5	Set command line editing character	Yes
S6	Set pause before blind dialing	Yes
S7	Set number of seconds to wait for connection completion	Yes
S8	Set number of seconds to wait when comma dial modifier used	Yes
T	Select tone dialing	Yes
V	Set result code format mode	Yes
X	Set connect result code format and call monitoring	Yes
Z	Set all current parameters to user-defined profile	Yes

ITU-T Recommendation 27.005 AT Commands

These commands are described in Chapter 3.

Command	Description	Supported
+CBM	Cell broadcast message directly displayed	Yes
+CBMI	Cell broadcast message stored in memory at specified <index> location	No
+CDS	SMS status report after sending a SMS	Yes
+CDSI	Incoming SMS status report	Yes
+CMGC	Send command	Yes
+CMGD	Delete message	Yes
+CMGF	Message format	Yes
+CMGL	List messages	Yes
+CMGR	Read message	Yes
+CMGS	Send message	Yes
+CMGW	Write message to memory	Yes
+CMMS	More messages to send	Yes
+CMNA	New message acknowledgement to ME/TA	Yes
+CMS ERROR: <err>	SMS error (mobile or network error)	Yes
+CMSS	Send message from storage	Yes
+CMT	Incoming message directly displayed	Yes
+CMTI	Incoming message stored in <mem> (“SM” - (U)SIM message storage) at location <index>	Yes
+CNMA	New message acknowledgement to mobile equipment	Yes
+CNMI	New message indications to TE	Yes
+CPMS	Preferred message storage	Yes
+CRES	Restore settings	No
+CSAS	Save settings	No
+CSCA	Service center address	Yes
+CSCB	Select cell broadcast message types	Yes
+CSDH	Show text mode parameters	Yes
+CSMP	Set text mode parameters	Yes
+CSMS	Select message service	Yes

ITU-T Recommendation Supported 27.007 AT Commands

These commands are described in Chapter 3.

Command	Description	Supported
C	ITU T V.24 circuit 109 carrier detect signal behavior command **Format** • C<value> **Limitations** • Default <value> = 2 • <value> = 2 causes the AT/Data carrier detect pin to 'wink' (briefly switch off and on) when data calls end. • <value> = 0 or 1 performs as defined in the standard	Partially
+CACM	Accumulated call meter	No
+CACSP	Voice Group or Voice Broadcast Call State Attribute Presentation	N/A
+CAEMLPP	eMLPP Priority Registration and Interrogation	No
+CAHLD	Leave an ongoing Voice Group or Voice Broadcast Call	N/A
+CAJOIN	Accept an incoming Voice Group or Voice Broadcast Call	N/A
+CALA	Alarm	N/A
+CALCC	List current Voice Group and Voice Broadcast Calls	N/A
+CALD	Delete alarm	N/A
+CALM	Alert sound mode	No
+CAMM	Accumulated call meter maximum	No
+CANCHEV	NCH Support Indication	No
+CAOC	Advice of Charge	No
+CAPD	Postpone or dismiss an alarm	N/A
+CAPTT	Talker Access for Voice Group Call	N/A
+CAREJ	Reject an incoming Voice Group or Voice Broadcast Call	N/A
+CAULEV	Voice Group Call Uplink Status Presentation	N/A
+CBST	Select bearer service type	Yes
+CCCM	Current call meter value	No
+CCFC	Call forwarding number and conditions	Yes
+CCLK	Clock	N/A
+CCUG	Closed user group	Yes
+CCWA	Call waiting	Yes
+CCWE	Call Meter maximum event	No
+CDIP	Called line identification presentation	No
+CDIS	Display control	No
+CEER	Extended error report	No
+CFUN	Set phone functionality **Format** • +CFUN = [<fun> [, <rst>]] **Limitations** • Valid <fun> values: · 0 (minimum functionality, low power draw) · 1 (full functionality, high power draw)	Partially
+CGACT	PDP context activate or deactivate	Yes
+CGANS	Manual response to a network request for PDP context activation	No
+CGATT	PS attach or detach	Yes
+CGAUTO	Automatic response to a network request for PDP context activation	No
+CGCLASS	GPRS mobile station class	Yes
+CGCLOSP	Configure local octet stream PAD parameters	No
+CGCMOD	PDP Context Modify	No

Continued: Supported 27.007 AT Commands

+CGDATA	Enter data state	Yes
+CGDCONT	Define PDP Context	Yes
+CGDSCONT	Define Secondary PDP Context	Yes
+CGEQMIN	3G Quality of Service Profile (Minimum acceptable)	Yes
+CGEQNEG	3G Quality of Service Profile (Negotiated)	Yes
+CGEQREQ	3G Quality of Service Profile (Requested)	Yes
+CGEREP	Packet Domain event reporting	Yes
+CGEV	GPRS network event indication	Yes
+CGMI	Request manufacturer identification	Yes
+CGMM	Request model identification	Yes
+CGMR	Request revision identification	Yes
+CGPADDR	Show PDP address	Yes
+CGQMIN	Quality of Service Profile (Minimum acceptable)	Yes
+CGQREQ	Quality of Service Profile (Requested)	Yes
+CGREG	GPRS network registration status	Yes
+CGSMS	Select service for MO SMS messages	Yes
+CGSN	Request product serial number identification	Yes
+CGTFT	Traffic Flow Template	Yes
+CHLD	Call related supplementary services	Yes
+CHSA	HSCSD non-transparent asymmetry configuration	N/A
+CHSC	HSCSD current call parameters	N/A
+CHSD	HSCSD device parameters	N/A
+CHSR	HSCSD parameters report	N/A
+CHST	HSCSD transparent call configuration	N/A
+CHSU	HSCSD automatic user initiated upgrading	N/A
+CHUP	Hang up call	Yes
+CIEV	Indicator event	Yes
+CIMI	Request international mobile subscriber identity	Yes
+CIND	Indicator control	Yes
+CKEV	Key press or release event	No
+CKPD	Keypad control	No
+CLAC	List all available AT commands	No
+CLAE	Language Event	No
+CLAN	Set Language	No
+CLCC	List current calls Voice-enabled	N/A
+CLCK	Facility lock	Yes
+CLIP	Calling line identification presentation	Yes
+CLIR	Calling line identification restriction	Yes
+CLVL	Set/return internal loudspeaker volume	Yes
+CMAR	Master Reset	No
+CME ERROR: <err>	Mobile Termination error result code	Yes
+CMEC	Mobile Termination control mode	No
+CMEE	Report Mobile Termination error	Yes
+CMER	Mobile Termination event reporting	Yes
+CMOD	Call mode	Yes
+CMUT	Enable/disable uplink voice muting	Yes
+CNUM	Subscriber number	Yes

Continued: Supported 27.007 AT Commands

+COLP	Connected line identification presentation	Yes
+COPN	Read operator names	Yes
+COPS	Operator selection	Yes
+CPAS	Phone activity status	Yes
+CPBF	Find phonebook entries	Yes
+CPBR	Read phonebook entries	Yes
+CPBS	Select phonebook memory storage	Yes
+CPBW	Write phonebook entry	Yes
+CPIN	Enter PIN	Yes
+CPOL	Preferred operator list	Yes
+CPROT	Enter protocol mode	No
+CPUC	Price per unit and currency table	Yes
+CPWC	Power class	No
+CPWD	Change password	Yes
+CR	Service reporting control	Yes
+CRC	Cellular result codes	Yes
+CREG	Network registration	Yes
+CRING	Incoming call type	Yes
+CRLP	Radio link protocol	Yes
+CRMP	Ring Melody Playback	N/A
+CRSL	Ringer sound level	N/A
+CRSM	Restricted SIM access	Yes
+CSCC	Secure control command	No
+CSCS	Select TE character set	Yes
+CSDF	Settings date format	N/A
+CSGT	Set Greeting Text	N/A
+CSIL	Silence Command	N/A
+CSIM	Generic SIM access	Yes
+CSNS	Single numbering scheme	No
+CSQ	Signal quality	Yes
+CSSN	Supplementary service notifications	Yes
+CSTA	Select type of address	Yes
+CSTF	Settings time format	Yes
+CSVM	Set Voice Mail Number	No
+CTFR	Call deflection	Yes
+CTZR	Time Zone Reporting	N/A
+CTZU	Automatic Time Zone Update	No
+CUSD	Unstructured supplementary service data	Yes
+CV120	V.120 rate adaption protocol	No
+CVHU	Voice Hang up Control	No
+CVIB	Vibrator mode	N/A
D	ITU T V.25ter [14] dial command	Yes
D*99#	Sets up a packet data call (PDP context) based on profile ID #1	Yes
D*99***<n>#	Sets up a packet data call (PDP context) based on profile ID #<n> (<n> is the <cid> in the +CGDCONT command)	Yes
+VTD	Tone duration	Yes
+VTS	DTMF and arbitrary tone generation	Yes
+WS46	PCCA STD 101 [17] select wireless network	No

Chapter 2 – Modem-Specific Commands

Introduction

This chapter describes commands used to reset the modem, adjust customization settings, retrieve the firmware version, and monitor the temperature, voltage, and modem status.

Modem Status, Customization, and Reset Commands

!BAND Select / Return Frequency Band Set

Syntax:

Execution: **AT!BAND=<bandsetInd>**
Response: OK
Purpose: Select a set of bands

Query: **AT!BAND?**
Response: <bandsetInd>, Band set description
OK

or *(If the current band mask doesn't match a band set)*
Unknown band mask. Use AT!BAND to set band.
<bandmask>
OK

Purpose: Report the current band selection.

Query List: **AT!BAND=?**
Purpose: Display allowed values for <bandsetInd> and the corresponding frequency bands.

Description: Configures the modem to operate on a set of frequency bands, look up available sets, or return the current selection.

Note: These band sets are preconfigured by your device's manufacturer. The bands displayed by the query command (AT!BAND=?) depend on this configuration, as shown in this example.

Parameters: <bandsetInd> (Band index value—When configured for 'all regions', all of the bands supported by the modem will appear):

00 = All bands
01 = WCDMA 2100
02 = WCDMA 850/1900
03 = GSM 900/1800
04 = GSM 850/1900
05 = GSM ALL
06 = WCDMA 2100 GSM 900/1800
07 = WCDMA 850/1900 GSM 850/1900
08 = WCDMA ALL
09 = WCDMA 850/2100
0A = WCDMA 800/2100

0B = WCDMA 850/2100 GSM 900/1800
0C = WCDMA 850 GSM 900/1800
0D = WCDMA 850
0E = WCDMA 900
0F = WCDMA 900/2100

Example: When configured for a specific region, AT!BAND=? could return:
00, All bands
01, WCDMA 2100
02, N/A (Defaults to All)
03, GSM 900/1800
04, N/A (Defaults to ALL)
05, GSM ALL
06, N/A (Defaults to ALL)
07, N/A (Defaults to ALL)
08, WCDMA ALL
09, N/A (Defaults to ALL)
0A, N/A (Defaults to ALL)
0B, N/A (Defaults to ALL)
0C, N/A (Defaults to ALL)
0D, N/A (Defaults to ALL)
0D, N/A (Defaults to ALL)
0E, N/A (Defaults to ALL)
0F, N/A (Defaults to ALL)

^CARDMODE Return SIM Card Mode (Card Type)

Syntax:
Execution: **AT^CARDMODE**
Response: ^CARDMODE: <sim_type>
OK
Purpose: Identify the SIM card type in the device.

Description: Identify the type of SIM card being used.

Parameters: <sim_type> (SIM card type):
0 = Unknown
1 = SIM
2 = USIM

*CNTI Report Current, Available, and Supported Network Technologies

Syntax:

Execution: **AT*CNTI=<n>**
Response: *CNTI: <n>,<tech>[,<tech>[...]] +CME ERROR: <err>
OK
Purpose: Display current, available, and supported network technologies.

Description: Display the network technology currently being used, the technologies available for use, or the technologies supported by the modem.

Parameters: <n> (Reporting option):
- 0 = Network technology currently in use
- 1 = Available technologies on current network
- 2 = All technologies supported by the modem

<tech> (Technology type):
ASCII string
Valid values:
- "GSM"
- "GPRS"
- "EDGE"
- "UMTS"
- "HSDPA"
- "HSUPA"
- "HSDPA/HSUPA"
- "HSPA+"
- "Unknown"

+CQI Enable/Disable/Return Averaged CQI Return

Note: **This command is for WCDMA only.**

Syntax:

Execution: **AT!CQI=<enableFlag>**
Response: +CQI:
ENABLED!
OK
or +CQI:
DISABLED!
OK
Purpose: Enable or disable the query command (+CQI?).

Query: **AT!CQI?**
Response: +CQI:
Status: <enableFlag>
total valid samples <n>, average cqi <m>
Purpose: Return the average CQI (<m>) and the number of samples (<n>) used to determine the average.

Description: Enable or disable ability to return averaged CQI (Channel Quality Indicator) from the modem, or return the value (if enabled).

Parameters: <enableFlag> (Enable/disable CQI value retrieval):
- 0 = Disable retrieval
- 1 = Enable retrieval

+ECIO Return Total Energy Per Chip Per Power Density Value

Note: **This command is for WCDMA only.**

Syntax:

Query: **AT+ECIO?**

Response: +ECIO:
Ec/Io: <value1> dB [<value2> dB [<value3> dB]]

Purpose: Return the signed dB values of the three strongest cells in the active set. The values are listed from strongest to weakest, based on RSCP, and separated by tabs. If there are less than three cells, only those values appear. For example:

+ECIO:
Ec/Io: -3.5 dB -14.0 dB -24.5 dB
---or---
+ECIO:
Ec/Io: -7.5 dB

Description: Return the total energy per chip per power density (Ec/Io) value of the active set's three strongest cells.

Parameters: <value> (Ec/Io of cell in the active set):
Valid range: -31.5 dB to 0 dB

Note: The command +USET also displays *Tot Ec/Io* as one of its outputs.

+ETFCI Enable/Disable/Return E-TFCI Average Value

Syntax:

Execution: **AT+ETFCI=<status>**

Response: +ETFCI:
ENABLED!
OK

or +ETFCI:
DISABLED!
OK

Purpose: Enable or disable the ability to check the average E-TFCI value.

Query: **AT+ETFCI?**

Response: +ETFCI:
Status: <status>
total samples 1280, average etfci <etfci>
OK

Purpose: Indicate if E-TFCI checking is enabled, and report the total number of samples and average E-TFCI value.

Description: Enable/disable checking of average E-TFCI values during HSUPA call, or return the value. The average value is based on 64 sets of log values extracted from the E-DPCCH packet:

- Every 200 ms (for 10 ms TTI)—Each set includes 20 samples. A total of 1280 samples are taken (200 ms/set, 20 samples per set, 64 sets over 12.8 seconds).
- Every 80 ms (for 2 ms TTI)—Each set includes 40 samples. A total of 2560 samples are taken (80 ms/set, 40 samples per set, 64 sets over 5.12 second period).

Note: An HSUPA call must be in progress to obtain the E-TFCI.

Parameters: <status> (E-TFCI reporting status):
0 = Disabled
1 = Enabled

<etfci> (Average E-TFCI value over sampling period):
Valid range: 0–127

!GETBAND Return the Current Active Band

Syntax:
Query: **AT!GETBAND?**
Response: !GETBAND: <active band description>
OK
or Unknown
OK
Purpose: Return a description of the current active band, or return an error message.

Description: Return the active band currently being used by the modem.

Note: Due to stack implementation requirements, !GETBAND reports W800 for both W800 and W850.

!GETRAT Return the Current Active Radio Access Technology (RAT)

Syntax:
Query: **AT!GETRAT?**
Response: !GETRAT: <active RAT description>
OK
or Unknown
OK
Purpose: Return a description of the current RAT, or return an error message.

Description: Return the RAT currently being used by the modem.

!GRELIMEI Return the Modem's Production TAC

Syntax:
Query: **AT!GRELIMEI?**
Response: <TAC>
OK
Purpose: Return the <TAC> assigned to the modem.

Description: Return the modem's production TAC (Type Allocation Code). (TAC is first 8 chars, then padded with Zeros).
For example, if IMEI is 289258158732085, the TAC is 289258150000000.

Parameters: <TAC>
15-character string. First 8 characters are the TAC, remainder of string is zero padded.

Example: If the modem's IMEI is 289258158732085, !GRELIMEI returns 289258150000000.

!GSMINFO Return 2G Network Information

Syntax:

Query: **AT!GSMINFO?**

Response:

```
!gsminfo:
Serving Cell:
PLMN:  <mccmnc>
LAC:  <lac>
Cell ID:  <cellid>
BSIC:  <bsic>
NCC:  <ncc>
BSCC:  <bscc>
RAC:  <rac>
Min Rx Lvl Rqd:  <minrx>
Max Rach:  <maxrach>
Band:  <band>
ARFCN: <arfcn>
RX level (dBm):  <rxlvl>
C1:  <c1>
C2:  <c2>
C31:  <c31>
C32:  <c32>

Neighbor Cells:
Band:  <band> <band> <band>
ARFCN: <arfcn> <arfcn> <arfcn>
RAC:  <rac> <rac> <rac>
RX level (dBm):  <rxlvl> <rxlvl> <rxlvl>
C1:  <c1> <c1> <c1>
C2:  <c2> <c2> <c2>
C31:  <c31> <c31> <c31>
C32:  <c32> <c32> <c32>
OK
```

Purpose: Display serving cell and neighbor cell information.

Description: Return 2G network information for the ‘serving’ cell and up to 6 ‘neighbor’ cells.

Parameters:

<mccmnc> (Mobile Country Code and Mobile Network Code (combine to form the PLMN)):
16-bit decimal

<lac> (Location Area Code):
16-bit decimal

<cellid> (Cell ID):
16-bit decimal

<bsic> (Base Station Identity Code):
8-bit decimal

<ncc> (Network Color Code):
8-bit decimal

<bscc> (Base Station Color Code):
8-bit decimal

<rac> (Routing Area Code):
8-bit decimal

<minrx> (Minimum Rx level (dBm) needed to register):
16-bit decimal

<maxrach> (Reserved for future use):
16-bit decimal

<band> (2G network band):
Valid values:
"E900"
"P900"
"1900"
"1800"
"850"
"Unknown"

<arfcn> (Absolute Radio Frequency Channel Number):
16-bit decimal

<rxlvl> (Received BCCH frequency level (dBm)):
16-bit decimal

<c1> (C1 cell selection criteria):
16-bit decimal

<c2> (C2 cell selection criteria):
16-bit decimal

<c31> (C31 cell selection criteria):
16-bit decimal

<c32> (C32 cell selection criteria):
16-bit decimal

!GSTATUS Return Operational Status

Syntax:

Query: **AT!GSTATUS?**

Response: !GSTATUS:

Current Time:	<ctime>	Temperature:	<temp>
Bootup Time:	<btime>	Mode:	<mode>
System mode:	<smode>	PS state:	<PSstate>
WCDMA band:	<wband>	GSM band:	<gband>
WCDMA channel:	<wchan>	GSM channel:	<gchan>
GMM (PS) state:	<gmmstate>	<gmmsubstate>	
MM (CS) state:	<mmstate>	<mmsubstate>	

OK

Purpose: Display modem operational status information.

Description: Return specific details about the current operational status of the modem.

Parameters:

<ctime> (Current time (Seconds from bootup))

<temperature> (Approximate temperature (□5□C))

<btime> (Bootup Time (Seconds from reset)

<mode> (Current modem mode):
Valid values:
"POWERING OFF"
"FACTORY TEST"
"OFFLINE"
"ONLINE"
"LOW POWER MODE"
"RESETTING"
"NETWORK TEST"
"OFFLINE REQUEST"
"PSEUDO ONLINE"
"Unknown"

<smode> (System mode acquired by modem):
Valid values:
"No service"
"AMPS"
"CDMA"
"GSM"
"HDR"
"WCDMA"
"GPS"
"WCDMA+GSM"
"Unknown"

<PSstate> (Current PS state):
Valid values:
"Attached"
"Not attached"

<wband> (Current WCDMA band being accessed):
Valid values:
"CDMA cell"
"CDMA PCS"
"IMT2000"
"WCDMA1900"
"WCDMA1800"
"WCDMA800"
"GSM EGSM900"
"GSM DCS1800"
"GSM 850"
"GSM1900"
"GPS"
"No band"
"WCDMA900"

<gband> (Current GSM band, either TCH or BCCH):
Valid values:
"GSM850"
"GSM900"
"DCS1800"
"PCS1900"
"Unknown"

<wchan> (WCDMA channel number)

<gchan> (GSM channel number)

<gmmstate> (Current GMM state):
Valid values:
"IDLE"
"DEREGISTERED"
"Registering"
"REGISTERED"
"Deregistering"
"RA updating"
"Requesting srvc"

<gmmsubstate> (Current GMM sub-state):
• Valid values:
"NORMAL SERVICE"
"LIMITED SERVICE"

"ATT NEEDED"
"ATTEMPTING ATT"
"NO IMSI"
"NO SERVICE"
"PLMN SEARCH"
"SUSPENDED"
"UPDATE NEEDED"
"UPDATING"
"DEATACHING"
"---" (Indicates 'undefined sub-state')

<mmstate> (Current MM state):
Valid values:
"NULL"
"IDLE"
"LA Rejected"
"LA Start"
"CONNECTED"
"Network Command"
"---" (Indicates 'undefined state')

<mmsubstate> (Current MM sub-state):
Valid values:
"NORMAL SERVICE"
"LIMITED SERVICE"
"NO IMSI"
"NO SERVICE"
"PLMN SEARCH"
"UPDATE NEEDED"
"UPDATING"
"---" (Indicates 'undefined sub-state')

!GVER Return the Firmware Version

Syntax: **Query:** **AT!GVER?**
Response: !GVER: <versionString>
OK
Purpose: Return the firmware version number.

Description: Return the firmware version.

Parameters: <versionString> (Firmware's version string):
Format: yyyy/mm/dd hh:mm:ss

^HVER Return the Modem Hardware Version

Syntax:

Query: **AT^HVER**
Response: <versionString>
OK
Purpose: Return the hardware version number.

Description: Return the modem's hardware version number based on the FSN.
The version number is returned as a short string representing the actual version.

Parameters: <versionString> (Hardware version number):
Examples:
"E2" – Eng2 device
"1.0" – Production v1.0
"1.1" – Production v1.1

!PCTEMP Return Current Temperature Information

Syntax:

Query: **AT!PCTEMP?**
Response: Temp state: <state> Temperature: <temperature> degC
OK
Purpose: Return the module's temperature information.

Description: Return the module's temperature state and actual temperature.

Parameters: <state> (Temperature state):
Valid values:
"Normal"
"High Warning"
"High Critical"
"Low Critical"

<temperature> (Current temperature):
Current temperature in degrees Celsius. This is the highest temperature reported by the two thermistors (one measures the PA (Power Amplifier) used by the WCDMA transceiver, the other measures the temperature of the PA used by the GSM transceiver).

!PCVOLT Return Current Power Supply Voltage Information

Syntax:

Query: **AT!PCVOLT?**
Response: Volt state: Normal
Power supply voltage: <voltage> mV (<raw> cnt)
OK
Purpose: Return the module's voltage information.

Description: Return the module's power supply state and actual voltage.

Parameters: <state> (Power supply state):
Valid values:
"Normal"
"High Critical"
"Low Warning"
"Low Critical"
<voltage>:
Current voltage reading in mV.
<raw>:
Analog/Digital Convertor reading

!POWERDOWN Power Down System

Syntax:

Execution: **AT!POWERDOWN**
Response: OK
Purpose: Power the system down.

Description: Power down the system. After using this command, the modem will not communicate with the host until it has been power cycled.

Note: This command should only be used when testing using an appropriate testing jig—do not use it when the modem is installed in a computer.

!REL Return Active Protocol/Revision

Syntax:

Query: **AT!REL?**
Response: !REL:
Protocol: <wcdmarrc-string> (e.g. Release 99)
SGSN Revision: <sgsnr-string> (e.g. Dynamic)
MSC Revision: <mscr-string> (e.g. Dynamic)
Purpose: Report the current operating protocol, SGSN revision, and MSC revision.

Query List: **AT!REL=?**
Purpose: Display a list of valid parameter values.

Description: This command is used to indicate the modem's current protocol, SGSN, and MSC revision settings.

Parameters:

<wcdmarrc> (WCDMA RRC Revision (Protocol)):
- 00 = Release 99
- 01 = Release 5 (Default)
- 02 = Release 6
- 03 = Release 7

<sgsnr> (SGSN Revision):
- 00 = Release 97
- 01 = Release 99
- 02 = Release 5
- 03 = Dynamic (Default)—Uses whichever protocol is broadcast by the network.

<mscr> (MSC Revision):
- 00 = Release 97
- 01 = Release 99
- 02 = Release 5
- 03 = Dynamic (Default)—Uses whichever protocol is broadcast by the network.

!RESET Reset the Modem

or

!GRESET Reset the Modem

Syntax:

Execution: **AT!GRESET or AT!RESET**
Response: OK
Purpose: Reset the modem.

Description: Perform a modem reset.

Note: This command !RESET and !GRESET are the same.

+RSCP Return Received Signal Code Power (RSCP)

Note: **This command is for WCDMA only.**

Syntax:

Query: **AT!RSCP?**
Response: +RSCP:
RSCP: <value1> dBm [<value2> dBm [<value3> dBm]]
Purpose: Return the RSCP values (signed dBm) of up to three cells, from the strongest to weakest cell.

Description: Return the RSCP of the active set's three strongest cells.

Parameters: <value> (RSCP of cell in the active set):
Valid range: -120 dB to -20 dB

!SCACT Activate/Deactivate PDP Context for FIFO Interface

Syntax:

Execution: **AT!SCACT=<state>[,<pid>]**
Response: OK
Purpose: Set the state of the identified profile (<pid>). If no <pid> is specified, profile 1 is updated.

Query: **AT!SCACT?[<pid>]**
Response: !SCACT: <pid>, <state>
[!SCACT: <pid>, <state>
[...]]
Purpose: Report the status of the identified profile (<pid>). If no <pid> is specified, the status of all profiles is returned.

Description: Activate or deactivate the specified PDP context for FIFO interface.

Parameters: <state> (PDP context activation state):
0 = Deactivated
1 = Activated
During assignment, any <state> other than 1 or 2 will return an ERROR response.

<pid> (PDP context definition):
Valid range: 1–16

!SCDFTPROF Set/Return Default Profile ID

Syntax:

Execution: **AT!SCDFTPROF=<pid>**
Response: OK
Purpose: Set the default profile ID to <pid>.

Query: **AT!SCDFTPROF?**
Response: !SCDFTPROF: <pid>
OK
Purpose: Return the default profile ID (<pid>).

Description: Set or return the default profile ID.

Parameters: <pid> (Profile ID):
Valid range: 1–16 — A valid profile ID that will be used as the default

!SCDNS Set/Return Profile ID DNS Address

Syntax:

Execution: **AT!SCDNS=<pid>,<pri_dns>,<sec_dns>**
Response: OK
Purpose: Set the default primary and secondary IP addresses for domain name services.

Query: **AT!SCDNS?<pid>**
Response: !SCDNS: <pid>, <pri_dns>, <sec_dns>
Purpose: Return the primary (<pri_dns>) and secondary (<sec_dns>) DNS addresses for the specified profile (<pid>).

Description: Set or return the primary and secondary DNS addresses of a profile.

Parameters: <pid> (PDP context definition):
Valid range: 1–16 — A valid profile ID that will be used as the default

<pri_dns> (Default primary IP address for DNS lookup):
'Dot format' IP address. For example, 10.10.10.1
Overrides the DNS server address received over the air during PDP context activation

<sec_dns> (Default secondary IP address for DNS lookup):
'Dot format' IP address. For example, 10.10.10.1
Overrides the DNS server address received over the air during PDP context activation

!SCPADDR Return IP Address for Specified PDP Context

Syntax:

Execution: **AT!SCPADDR=[<pid>]**
Response: !SCPADDR: <pid><addr>
[!SCPADDR: <pid>, <addr>
[...]]
OK
Purpose: Return the IP address for the specified <pid>. If <pid> is blank, return IP addresses for all defined profiles.

Description: Return the IP address of the specified PDP context (profile), or for all profiles.

Parameters:

<pid> (Profile ID (PDP context)):
Valid range: 1–16

<addr> (IP address of <pid>):
'Dot' format IP address (for example, 255.255.255.0)

!SCPROF Set/Return SWI-Specific Profile Information

Syntax:

Execution: **!SCPROF=<pid>, Label>, <autoconnect>, <promptforpassword>, <autolaunchapp>, <rffu>**
Response: OK
Purpose: Set the SWI-specific information for the specified profile (<pid>).

Query: **!SCPROF?<pid>**
Response: !SCPROF: <pid>, <label< <autoconnect>, <promptforpassword>, <autolaunchapp>, <rffu>
Purpose: Report current SWI-specific information for the specified profile (<pid>).

Description: Set or return the SWI specific information for a profile.

Parameters:

<pid> (PDP context definition):
Valid range: 1–16 — a valid profile ID that will be used as the default

<label> (Configuration buffer label):
30-character string surrounded by quotation marks

<autoconnect> (Automatic context activation mode):
0 = manual activation
1 = auto activation

<promptforpassword> (Flag value (prompt for password)):
0 = do not prompt for password
1 = prompt for password

<autolaunchapp> (Flag value (auto launch application)):
0 = do not auto launch the application
1 = auto launch the application

<rffu> (Reserved for future use):
0–32767 = Reserved

!SCPROFDEL Erase Profile Information

Syntax:

Execution: **!SCPROFDEL=<pid>**
Response: OK
Purpose: Delete the identified profile. If <pid> is blank, delete all profiles.

Query List: **!SCPROFDEL=?<pid>**
Purpose: Return usage instructions.

Description: Erase the information for one or all profiles.

Parameters: <pid>: PDP context definition
Valid range: 1–16

!SCWINS Set/Return Profile's WINS Addresses

Syntax:

Execution: **!SCWINS=<pid>,<pri_wins>,<sec_wins>**
Response: OK
Purpose: Set the primary and secondary WINS addresses for the specified profile.

Query: **!SCWINS?<pid>**
Response: <pid>, "<pri_wins>", "<sec_wins>"
OK
Purpose: Return the primary and secondary WINS addresses for the specified profile.

Description: Set or return a profile's primary and secondary WINS (Windows Internet Name Services) addresses.

Parameters: <pid>: PDP context definition
Valid range: 1–16

<pri_wins>: Primary IP address used for WINS
Overrides WINS address received over the air during PDP context activation.
Dot format IP address (for example, 10.10.10.1)

<sec_wins>: Secondary IP address used for WINS
Overrides WINS address received over the air during PDP context activation.
Dot format IP address (for example, 10.10.10.2)

!SDNOTINSTALLED Return SD Installation Status

Syntax:

Query: **AT!SDNOTINSTALLED?**
Response: OK (An SD card is not installed)
or ERROR (An SD card is installed)
Purpose: Indicate if SD card is installed.

Description: Indicate if an SD card is in the modem.

!SELMODE Set/Return Current Service Domain

Syntax:

Execution: **AT!SELMODE=<sdInd>**
Response: OK
Purpose: Set the desired service domain.

Query: **AT!SELMODE?**
Response: <sdInd>, Service Domain description
OK
or Unknown service domain mask. Use AT!SELMODE to set service domain.
<sdInd>
OK
Purpose: Return the current service domain index (<sdInd>) and description. If the <sdInd> is undefined, an error message is returned.

Query List: **AT!SELMODE=?**
Purpose: Return a list of supported service domain indexes.

Description: Configure the modem to use a specific service domain.

Parameters: <sdInd> (Service domain index):
00 = CS only
01 = PS only
02 = CS and PS

!SELRAT Set/Return Current Radio Access Technology (RAT)

Syntax:

Execution: **AT!SELRAT=<ratInd>**
Response: OK
Purpose: Set the desired RAT configuration.

Query: **AT!SELRAT?**
Response: <ratInd>, RAT configuration description
OK
or Unknown RAT mode. Use AT!SELRAT to set mode.
<ratInd>
OK
Purpose: Return the current RAT configuration index (<ratInd>) and description. If the <ratInd> is undefined, an error message is returned.

Query List: **AT!SELRAT=?**
Purpose: Return a list of supported RAT configurations.

Description: Configure the modem to use a specific (or preferred) RAT.

Parameters: <ratInd> (RAT configuration index):
00 = Automatic
01 = UMTS 3G only
02 = GSM 2G only
03 = UMTS 3G preferred
04 = GSM 2G preferred

!SMSRETRY Set/Return SMS Retry Period and Interval

Syntax:

Execution: **AT!SMSRETRY=<period>, <interval>**
Response: OK
Purpose: Set the retry period and retry interval

Query: **AT!SMSRETRY?**
Response: !SMSRETRY:
<period>,<interval>
OK
Purpose: Return the current <period> and <interval> settings.

Query List: AT!SMSRETRY=?
Purpose: Display the execution command format.

Description: Configure the SMS retry period and interval for MO-SMS.

Parameters: <period> (Number of seconds allowed for MO-SMS retry attempts):
Valid range: 0–255

<interval> (Number of seconds to wait between MO-SMS retry attempts):
Valid range: 0–255

Notes: If <interval> is greater than <period>, a single retry attempt is made.
<interval> ignores the time spent actually performing a retry attempt.
If <interval> = 5, attempts are made at elapsedTime = 0, 5, 10, etc. until an attempt is successful or <period> - elapsedTime < <interval>.

Example 1: Assume a retry attempt takes 2 seconds.
If <period> = 1 and <interval> = 8, and no attempts are successful:

Time = 0: Retry attempt fails at time = 2. No more attempts are made because <period> has expired.

Example 2: Assume a retry attempt takes 2 seconds.
If <period> = 3 and <interval> = 5, and no attempts are successful:

Time = 0: Retry attempt fails at time = 2. No more attempts are made because <period> will expire before the <interval> passes.

Example 3: Assume a retry attempt takes 2 seconds.
If <period> = 14 and <interval> = 5, and no attempts are successful:

Time = 0: Retry attempt fails at time = 2; next attempt will begin at time=5 (the <interval> counts from the beginning of the previous attempt)

Time = 5: Retry attempt fails at time = 7; next attempt will begin at time=10

Time = 10: retry attempt fails at time = 12; No more attempts will be made because the <period> will expire before another <interval> of 5 seconds can pass.

!SMSSTSEN Enable/Disable SMS Status Reports

Syntax:

Execution: **AT!SMSSTSEN=<enable>, <mode>**
Response: OK
Purpose: Enable/disable status reports, and indicate if the user can enable/disable the feature.

Query: **AT!SMSSTSEN?**
Response: !SMSSTSEN:
<enable>, <mode>
OK
Purpose: Return the current <enable> and <mode> settings.

Query list: AT!SMSSTSEN=?
Purpose: Display the execution command format.

Description: Enable/disable SMS status reports for MO-SMS messages, or indicate if the user should be able to enable/disable the reports.

The status report indicates when a message is delivered to its intended recipient (in addition to the report that is sent when the network first receives the message).

Parameters: <enable> (Enable/Disable SMS status reports):

0 = Disable
1 = Enable

<mode> (User access to reporting feature):

0 = Read/Write (User can enable/disable the feature)
1 = Read only (User cannot enable/disable the feature—the feature status is preset by the device provider)

!SWICALLPROG Enable/Disable Call Progress Notification

Syntax:

Execution: **AT!SWICALLPROG=<cpnStatus>**
Response: !SWICALLPROG:<idx1>, <dir>, <state>, <mode>, <mpty>,<number>, <type>, <alpha>
!SWICALLPROG:<idx2>, <dir>, <state>, <mode>, <mpty>,<number>, <type>, <alpha>
...
Purpose: Display information on current calls, when the call status changes.

Query: **AT!SWICALLPROG?**
Response: <cpnStatus>
OK
Purpose: Return the current call progress notification status.

Description: Enable or disable call progress notification. This allows the host to receive call status updates such as type of call, answered, on hold, etc.

Note: When call progress notification is enabled, the standard AT command +CLCC (List Current Calls) is disabled.

Parameters: <cpnStatus> (Call progress notification status):

0 = Disabled
1 = Output on AT channel if AT is not blocked
2 = Output on AT channel even if AT is blocked
Any other value will return an ERROR response

<idx> (Call identification number):
Integer value as described in GSM 02.30 Section 4.5.5.1
Can be used in +CHLD command

<dir> (Call direction):
0 = Mobile-originated (MO)
1 = Mobile-terminated (MT)

<state> (Call state):
0 = Active
1 = Held
2 = Dialing (MO calls)
3 = Alerting (MO calls)
4 = Incoming (MT calls)
5 = Waiting (MT calls)
6 = Disconnected

<mode> (Bearer/teleservice):
0 = Voice
1 = Data
2 = Fax

<mpty> (Multiparty status):
0 = Not part of a multiparty (conference) call
1 = Part of a multiparty (conference) call

<number> (Telephone number of other end of connection):
format specified by next parameter (<type>)

<type> (Address octet type):
Two bit fields identifying the type of telephone number and numbering plan type (national/international).
Format specified in 3GPP TS 24.008 Section 10.5.4.7

<alpha> (Tag associated with <number> in the phonebook):
Example: “John Doe”

^SYSCONFIG Set/Return System Configuration Information

Syntax:

Execution: **AT^SYSCONFIG=<mode>, <acqOrder>, <roam>, <srvDomain>**
Response: OK
Purpose: Set the various configuration parameters. You must specify all of the parameters.

Query: **AT^SYSCONFIG?**
Response: <mode>, <acqOrder>, <roam>, <srvDomain>
OK
Purpose: Return the current modem configuration information.

Description:

Set or return the modem's configuration.

Parameters:

<mode> (Supported system mode):
- 2 = Auto-select
- 13 = GSM only
- 14 = WCDMA only
- 16 = No change—use this value with ^SYSCONFIG= if you do not want to change the current setting.

<acqOrder> (Network acquisition order)
- 0 = Automatic
- 1 = GSM, then WCDMA
- 2 = WCDMA, then GSM
- 3 = No change—use this value with ^SYSCONFIG= if you do not want to change the current setting.

<roam> (Roaming support)
- 0 = Not supported
- 1 = Supported
- 2 = No change—use this value with ^SYSCONFIG= if you do not want to change the current setting.

<srvDomain> (Service domain support)
- 0 = Circuit-switched only
- 1 = Packet-switched only
- 2 = Circuit- and packet-switched
- 3 = Any
- 4 = No change—use this value with ^SYSCONFIG= if you do not want to change the current setting.

^SYSINFO Return Service Status Information

Syntax:

Execution: **AT^SYSINFO**
Response: <srvStatus>, <srvDomain>, <roamStatus>, <sysMode>, <simStatus>
OK
Purpose: Set the various configuration parameters. You must specify all of the parameters.

Description: Return current service type and availability information, and the current status of the module's SIM in the format <srvStatus> <srvDomain> <roamStatus> <sysMode> <simState>.

Parameters: <srvStatus> (Service availability):
0 = No service
1 = Limited service
2 = Service
3 = Limited regional service
4 = Power save mode or deep sleep mode

<srvDomain> (Service domain):
0 = No service
1 = Circuit-switched service only
2 = Packet-switched service only
3 = Circuit- and packet-switched service

<roamStatus> (Roaming status indicator):
0 = Not roaming
1 = Roaming

<sysMode> (System mode):
0 = No service
3 = GSM/GPRS mode
5 = WCDMA mode

<simStatus> (SIM status):
0 = SIM is not available
1 = SIM is available
255 = No SIM, or the SIM has been PIN-locked (invalid PIN was entered and must be reset)

!TIME Set/Return Current Time of Day

Syntax:

Execution: **AT!TIME= <YYYY>,<MM>,<DD>,<hh>,<mm>,<ss> [, <TZ>, <DST>]**
Response: OK
Purpose: Set the current time.

Query: **AT!TIME?**
Response: !TIME:
<YYYY>/<MM>/<DD>
<hh>:<mm>:<ss> (local)
<YYYY>/<MM>/<DD>
<hh>:<mm>:<ss> (UTC)
OK
Purpose: Display current local and UTC time.

Query List: **AT!TIME=?**
Purpose: Display execution command format.

Description: Set or retrieve the current time of day—the time of day can be set using this command, or could be set by the network. If the time has not been set, the command returns ERROR.

Parameters:

<YYYY> (Year):
4 digits required

<MM> (Month):
Valid range: 01–12

<DD> (Day):
Valid range: 01–31

<hh> (Hour):
Valid range: 00-23

<mm> (Minute):
Valid range: 00–59

<ss> (Second):
Valid range: 00–59

<TZ> (Time zone offset from UTC in 15-minute increments):
Valid range: -48 to 48
<DST> must also be set if <TZ> is used

<DST> (Daylight Saving Time offset in 1-hour increments):
Valid range: 0 to 2
<TZ> must also be set if <DST> is used

!UDINFO Return Information from Active USB Descriptor

Syntax:

Query:	**AT!UDINFO?**
Response:	VID: <vendor_id> PID: <product_id> Manufacturer: <manuString> Product: <prodString>
Purpose:	Display USB descriptor information.

Description: Return information from the active USB descriptor.

Parameters:

<vid> (Vendor ID):
Valid range: 0000–FFFF

<pid> (Product ID):
Valid range: 0000–FFFF

<manuString> (Manufacturer string):
ASCII string (29 characters maximum)
Example: “Sierra Wireless, Incorporated”

<prodString> (Product string):
ASCII string (64 characters maximum)
Example: “Mini Card”

+UPSC Return Primary Scrambling Code

Note: **This command is for WCDMA only.**

Syntax:
Query: **AT+UPSC**
Response: +UPSC: <psc>
OK
Purpose: Display reference cell's PSC.

Description: Return the Primary Scrambling Code (PSC) of the reference WCDMA cell.

Parameters: <psc> (Primary Scrambling Code of reference WCDMA cell):
Valid range: 0-255
255 = No valid cell

+USET Return WCDMA Set Information

Syntax:
Query: **AT+USET?<set>**
Response: +USET: <setName>
Count: <count>
PSC: <psc> <ref>
SSC: <ssc>
STTD: <sttd>
Tot Ec/Io: <totEcIo>
Ec/Io: <EcIo>
RSCP: <rscp>
Window Size: <sinSize>
... *(repeat for <count> items)*
Purpose: Display detailed information about each item in the <set>.
Query List: **AT+USET=?**
Purpose: Display valid <set> values

Description: Return WCDMA set information (Active Set, Candidate Set, etc.).

Parameters: <set> (Set for which details are requested):
Valid range: 0–11 (see <setName> for descriptions)
<setName> (Description of <set> value):
ASCII string
Valid values:
0 = Active Set
1 = Sync Neighbor Set
2 = Async Neighbor Set
3 = Unlisted Set
4 = Add-Candidate Set
5 = Drop-Candidate Set
6 = After failed W2G Set
7 = DCH-Only Set
8 = HHO Active Set
9 = HHO Active No PN Set
10 = Candidate to Unlisted Set
11 = Saved Set
<count> (Number of items in <set>):
Valid range: 0-255
<psc> (Primary Scrambling Code):
Valid range: 0–FFFF
<ref> (Reference PSC designator string):
Displays "(REF)" if this is the reference PSC

<ssc> (Secondary Scrambling Code):
Valid range: 0–FFFF
<sttd> (Common Pilot Channel (CPICH) supports Space Time Transit Diversity):
0 = Not supported
1 = Supported
<totEcIo> (Total Ec/Io):
Valid range: 00–FF
To convert to a dB value, convert to decimal and divide by -2.
Example: 0x0B / -2 = 11 / -2 = -5.5 dB
Note: The command AT+ECIO? also reports Total Ec/Io as a dB value.
<EcIo> (Best path Ec/Io):
Valid range: 00–FF
To convert to a dB value, convert to decimal and divide by -2.
Example: 0x0B / -2 = 11 / -2 = -5.5 dB
<rscp> (Received Signal Code Power):
Valid range: 0-FFFF
<winSize> (Search window size):
Valid range: 0000–FFFFFFFF

&V Return Operating Mode AT Configuration Parameters

Syntax:

Execution: **AT&V**

Response: &C: 2; &D: 2; &F: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 0; Z: 0; S0: 0; S2: 43; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50; S8: 2; S9: 6; S10: 14; S11: 95; +FCLASS: 0; +ICF: 3,3; +IFC: 2,2; +IPR: 115200; +DR: 0; +DS: 0,0,2048,6;+WS46: 12; +CBST: 0,0,1;+CRLP: (61,61,48,6,0),(61,61,48,6,1),(240,240,52,6,2);+CV120: 1,1,1,0,0,0; +CHSN: 0,0,0,0; +CSSN: 0,0; +CREG: 0; +CGREG: 0;+CFUN:; +CSCS: "IRA"; +CSTA: 129; +CR: 0; +CRC: 0; +CMEE: 2; +CGDCONT: (1,"IP","","",0,0); +CGDSCONT: ; +CGTFT: ; +CGEQREQ: ; +CGEQMIN: ; +CGQREQ: ; +CGQMIN: ;+CGEREP: 0,0; +CGDATA: "PPP"; +CGCLASS: "A"; +CGSMS: 3; +CSMS: 0;+CMGF: 0; +CSCA: "",; +CSMP: ,,0,0; +CSDH: 0; +CSCB: 0,"","; +FDD: 0;+FAR: 0; +FCL: 0; +FIT: 0,0; +ES: ,,; +ESA: 0,,,,0,0,255,; +CMOD: 0;+CVHU: 0; +CPIN: ,; +CMEC: 0,0,0; +CKPD: 1,1; +CGATT: 0; +CGACT: 0;+CPBS: "SM"; +CPMS: "SM","SM","SM"; +CNMI: 0,0,0,0,0; +CMMS: 0; +FTS: 0;+FRS: 0; +FTH: 3; +FRH: 3; +FTM: 96; +FRM: 96; +CCUG: 0,0,0;+COPS: 0,0,""; +CUSD: 0; +CAOC: 1; +CCWA: 0; +CPOL: 0,2,""; +CTZR: 0;+CLIP: 0; +COLP: 0; +CMUX: 0,0,5,31,10,3,30,10,2;!CMUX: 0,0,5,31,10,3,30,10,2
OK

Purpose: Display command parameters.

Description: Return the status of all AT command parameters that apply to the current operating system.

Diagnostic Command

This command is used to diagnose modem problems.

!MXSTATS Display/Clear 27.010 Statistics

Syntax:

Execution: **AT!MXSTATS=0**
Response: OK
Purpose: Clear the statistics.

Query: **AT!MXSTATS?**
Response: !MXSTATS:
Sessions Started: <value>
Sessions Ended: <value>
SABM (Tx/Rx): <value> / <value>
DISC (Tx/Rx): <value> / <value>
UA (Tx/Rx): <value> / <value>
DM (Tx/Rx): <value> / <value>
UIH (Tx/Rx): <value> / <value>
T1 expiry: <value>
T2 expiry: <value>
T3 expiry: <value>
N1 count: <value>
N2 count: <value>
Bad Frame (addr): <value>
Bad Frame (ctl): <value>
Bad Frame (len): <value>
Bad Frame (F9): <value>
Bad Frame (fcs): <value>
Bad Frame (mem): <value>
OK
Purpose: Display the statistics.

Description: TS 27.010 is a standard that defines a multiplexing protocol between a mobile station and a terminal. This standard is supported on the modem and !MXSTATS is used to display statistics related to that protocol for debugging purposes.

Parameters: <value> (Unique values for each statistic):
Values accumulate until cleared by issuing the command AT!MXSTATS=0

SIM Commands

These commands are used to communicate with an installed (U)SIM.

!AUTH Run GSM Algorithm on SIM

Syntax:

Execution: **AT!AUTH=<randNumber>**
Response: AT!AUTH: <SRES>, <key>
OK
or ERROR (no SIM or "PCSDISABLE" customization bit 1 is set)
Purpose: Return the SIM's response and a 64-bit ciphering key:

Note: This command can only be used when the second bit (Bit 1) of the "PCSCDISABLE" customization bitmap is not set. (See !CUSTOM in the *Part 2—Extended AT Commands* in the manual.)

Description: Authenticate the SIM using a random number.

Parameters:

<randNumber>:
16 bytes (32 hexadecimal digits) random number), without leading '0x'.
Example: 123A567B9012C4567D90123E56789012

<SRES> (SIM response):
4 bytes (8 hexadecimal digits), without leading '0x'.
Example: 500e2879

<key> (Ciphering key):
8 bytes (16 hexadecimal digits), without leading '0x'.
Example: ec793ac5662e7000

!ICCID Return (U)SIM Card's ICCID

Syntax:

Query: **AT!ICCID?**
Response: !ICCID: <iccid>
OK
Purpose: Display the ICCID.

Description: Return a (U)SIM's ICCID (Integrated Circuit Card ID).

Parameters: <iccid> (ICCID of the (U)SIM currently being tested):
20 digit decimal number—This number is often printed on the (U)SIM card.

!SPN Return (U)SIM Card's SPN

Syntax:

Query: **AT!SPN?**
Response: !SPN: <display>, <spn>
OK
or ERROR
Purpose: Display the SIM's SPN.

Description: Return a (U)SIM's SPN (Service Provider Name) and ME display requirements (as defined in 3GPP 31.1028.

Parameters:

<display> (PLMN/SPN name display requirement):
8-bit integer value (0–255)

Bit 0 (Registered PLMN name display requirement):
Indicates if ME must display registered PLMN name when the registered PLMN is either HPLMN or a PLMN in the service provider PLMN list.
0 = Not required
1 = Required

Bit 1 (SPN name display requirement):
Indicates if ME must display the SPN when the registered PLMN is neither HPLMN nor a PLMN in the service provider PLMN list.
0 = Required
1 = Not required

<spn> (Service Provider Name):
ASCII string contained within quotes.
Example: "randomSPN"

Chapter 3 – Supported GSM/WCDMA 3G AT Commands

Supported ITU-T Recommendation V.250 Commands

&D Set DTR Function Mode

Description: This command controls the Data Terminal Ready (DTR) function mode.

Syntax:

Command	Responses
Action Command: AT&D[<n>]	OK

No Read and Test Commands

Values: **<n>** **DTR Signal Control Parameter**

- **0** The DTR signal is ignored
- **1** Modem switches from data to command mode when DTR switches from ON to OFF
- **2** Upon DTR switch from ON to OFF, the call is released. **Default.**

Parameter Storage: The <n> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT&D0 Note: The DTR signal is ignored	OK Note: Command valid
AT&D1 Note: Modem switches from data to command mode when DTR switches from ON to OFF	OK Note: Command valid
AT&D2 Note: Upon DTR switch from ON to OFF, the call is released	OK Note: Command valid

&F Restore Factory Settings

Description: This command is used to restore the factory settings from EEPROM.

Syntax:

Command	Responses
Action Command: AT&F<n>	OK

No Read and Test Commands

Values: **<n>** **Setting Restore Parameter**
If <n> is not omitted and with a value different from 0, the response is OK without any treatment.
0 Restore factory settings

Examples:

Command	Responses
AT&F Note: Ask for restoring the factory settings	OK Note: Done
AT&F0 Note: Ask for restoring the factory settings	OK Note: Done

Notes:

- For each parameter, the section "Parameter Storage" specifies which default values can be restored using AT&F. The parameters are restored in RAM and in E2P, overwriting the profile set with AT&W.
- This command does not update the +IPR command.

&S Set DSR Signal

Description: This command controls the Data Set Ready (DSR) signal.

Syntax:

Command	Responses
Action Command: AT&S[<n>]	OK

No Read and Test Commands

Values: **<n>** **DSR Signal Control Parameter**
0 DSR always ON
1 DSR OFF in command mode. DSR ON in data mode. **Default.**

Parameter Storage: The <n> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT&S0 Note: DSR always on	OK
AT&S1 Note: DSR off in command mode. DSR on in data mode	OK

&T Auto-Tests

Description: This command runs various auto-tests.

Syntax:

Command	Responses
Action Command: AT&T[<n>]	OK

No Read and Test Commands

Values: **<n>** **Auto-Test Activation**

- **0** Perform software auto-tests
- **1** Execute the audio loop test (close)
- **2** Stop the audio loop test (open)

Examples:

Command	Responses
AT&T0 Note: Perform software auto-tests	OK Note: No software problem detected; all checksums are correct

Notes:

AT&T command has to be used when the MS is registered in order to process the AUDIO test loop correctly.

Caution:
The audio loop activation (enabled with AT&T1 command, disabled with AT&T2 command) involves some restrictions on the use of other AT commands.

- Audio loop mode must not be enabled when a communication is active.
- Audio loop mode must not be enabled when a tone is under generation.
- Audio loop must be disabled (if active) before opening a communication;
- Tone generation and Side Tone modification must not be possible when the audio loop is active.

&V Display Configuration

Description: This command is used to display the modem configuration.

Syntax:

Command	Responses
Action Command: AT&V[<n>]	Q:<val1> V:<val2> S0:<val3> S2:<val4> S3:<val5> S4:<val6> S5:<val7> +CR:<val8> +CRC:<val9> +CMEE:<val10> +CBST:<val11> +SPEAKER:<val12> +ECHO:<val13> &C:<val14> &D:<val15> %C:<val16> [+IPR:<val17>] +ICF:<val18> +IFC:<val19> OK Note: For each <valx> parameter, please refer to the corresponding command.

No Read or Test Commands

Values: **<n> Displays Control Parameter**

- **0** Displays the modem configuration in RAM. **Default** value if no parameter provided.
- **1** Displays the modem configuration in EEPROM.
- **2** Displays the modem factory configuration.

Examples:

Command	Responses
AT&V Note: Display active parameters in RAM	Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008 +CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1 +SPEAKER:0 +ECHO:1,4 &C:1 &D:2 %C:0 +IPR:9600 +ICF:3,4 +IFC:2,2 OK Note: Done for Echo. The first parameter indicates the echo cancellation activation and the second parameter indicates the chosen algorithm. If no echo cancellation is activated, the response is "+ECHO: 0".

Notes:

The parameters displayed are the following:

- For <n> = 0 or 1
  Q:val1, V:val2, S0:val3, S2:val4, S3:val5, S4:val6, S5:val7,
  +CR:val8, +CRC:val9, +CMEE:val10, +CBST:val11,
  +SPEAKER:val12, +ECHO:val13, &C:val14, &D:val15, %C:val16
  +IPR:val17, +ICF:val18, +IFC:val19

- For <n> = 2
  Q:val1, V:val2, S0:val3, S2:val4, S3:val5, S4:val6, S5:val7,
  +CR:val8, +CRC:val9, +CMEE:val10, +CBST:val11,
  +SPEAKER:val12, +ECHO:val13, &C:val14, &D:val15, %C:val16
  +ICF:val18, +IFC:val19
  The +IPR value is not returned for <n>=2.

&W Save Configuration

Description: This command writes the active configuration to a non-volatile memory (EEPROM) .

Syntax:

Command	Responses
Action Command: AT&W	OK

No Read and Test Commands

Values: None

Examples:

Command	Responses
AT+IPR=9600 Note: Change data rate in memory only	OK
AT&W	OK
AT+CFUN=1	OK
AT+IPR?	+IPR: 9600 OK

+DR V42bis Data Compression Report

Description: This command enables or disables the +DR intermediate result code that represents the current DCE-DCE data compression type. This intermediate result code, if enabled, is issued before the final result code, after the service report control +CR, and before the +ILRR intermediate report.

Syntax:

Command	Responses
Action Command: AT+DR=<status>	OK
Read Command: AT+DR?	+DR: <status> OK
Test Command: AT+DR=?	+DR: (list of supported <status>s) OK

Intermediate Response: +DR: <direction>

Values:

<status> Status of the V42bis use

0	Disabled. Default value.
1	Enabled

<direction> DCE-DCE Data Compression Type

None	Data compression is not use
V42B	V42bis is in use in both directions
V42B RD	V42bis is in use in receive direction only
V42B TD	V42bis is in use in transmit direction only

Parameter Storage: <status> is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+DR=?	+DR: (0-1) OK
AT+DR=1 Note: Reporting enabled	OK
AT+DR?	+DR: 1 OK
ATD01234567879 Note: Outgoing data call	+DR: V42B CONNECT 9600

+DS V42bis Data Compression

Description: This command enables or disables V.42bis data compression if this feature is supported on the product. Note that the product allows only the MNP2 protocol.

Syntax:

Command	Responses
Action Command: AT+DS=[<dir>] [, [<neg>] [,[<P1>] [,[<P2>]]]]	OK
Read Command: AT+DS?	+DS: <dir>,<neg>,<P1>,<P2> OK
Test Command: AT+DS=?	+DS: (list of supported <dir>s), (list of supported <neg>s), (list of supported <P1>s), (list of supported <P2>s) OK

Values:

<dir> The desired direction(s) of operation for the data compression feature from the DTE point of view.
- **0** Negotiated
- **1** Transmit only
- **2** Receive only
- **3** Both directions, accept any direction. **Default.**

<neg> Specifies whether or not the DCE may continue to operate if the desired result is not obtained.
- **0** Do not disconnect if V42bis is not negotiated by the remote DCE as specified in <dir>. **Default.**
- **1** Disconnect if V42bis is not negotiated by the remote DCE as specified in <dir>

<P1> The maximum number of dictionary entries that may be negotiated,
Range: 512 to 2048. **Default is 2048**.

<P2> The maximum string length to be negotiated.
Range: 6 to 250. **Default is 20**.

Parameter Storage: All parameters are stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+DS=?	+DS: (0-3),(0,1),(512-2048),(6-250) OK
AT+DS=3,0,2048,250 Note: Set new parameters	OK
AT+DS?	+DS: 3,0,2048,250 OK

+GCAP Request Complete TA Capabilities List

Description: Displays the complete list of TA capabilities.

Syntax:

Command	Responses
AT+GCAP	+GCAP: (list of supported <name>s) OK

Values:

<name>	Supported Capability
+CGSM	CGSM Command Supported

Examples:

Command	Responses
AT+GCAP Note: Get capabilities list	+GCAP: +CGSM OK Note: Supports GSM commands

+GMI Request Manufacturer Identification

Description: Displays the manufacturer identification.

Syntax:

Command	Response
AT+GMI	xxxxxx MODEM OK

Values: None

Examples:

Command	Responses
AT+GMI Note: Get manufacturer identification	xxxxx MODEM OK Note: Command valid, xxxxx modem

+GMM Request TA Model Identification

Description: Displays the supported frequency bands. With multi-band products the response may be a combination of different bands.

Syntax:

Command	Responses
AT+GMM	<model> OK

Values:

<model>	Frequency Bands Selected
G850	GSM 850
900E	GSM 900 Extended
1800	DCS 1800
1900	PCS
MULTIBAND 900E 1800	Multi-Band: GSM 900 extended band and DCS 1800
MULTIBAND G850 1900	Multi-Band: GSM 850 and PCS

Examples:

Command	Responses
AT+GMM Note: Get hardware version	MULTIBAND 900E 1800 OK Note: Multiband: GSM 900 MHz extended band and DCS 1800 (default configuration)
AT+GMM Note: Get hardware version	900E OK Note: 900 Extended
AT+GMM Note: Get hardware version	1800 OK Note: DCS
AT+GMM Note: Get hardware version	1900 OK Note: PCS
AT+CGMM Note: Get hardware version	G850 OK Note: GSM 850
AT+GMM Note: Get hardware version	MULTIBAND G850 1900 OK Note: Multiband: GSM 850 and PCS

+GMR Request Revision Identification

Description: Displays the revised software version.. This command is the same as +CGMR.

Syntax:

Command	Responses
AT+GMR	<SW release>.<modem> <size> <date> <time> OK

Values:

<SW release> software release
<modem> type of Wireless modem
<size> software size
<date> date (mmddyy) of software generation
<time> hour (hh:mm) of software generation

Examples:

Command	Responses
AT+GMR Note: Get software ver.	R70_00gg.WMP100 2009124 012408 21:14 OK Note : Software release v7.0, generated on January 24, 2008.

+GSN Product Serial Number

Description: Allows the user application to get the IMEI (International Mobile Equipment Identity, 15-digit number) of the product.

Syntax:

Command	Responses
AT+GSN	<IMEI> OK

Values: **<IMEI>** A 15-digit number serial number

Examples:

Command	Responses
AT+GSN Note: Get the IMEI	012345678901234 OK Note: IMEI read from EEPROM

+ICF DTE-DCE Character Framing

Description: This command determines the local serial port start-stop (asynchronous) character framing used by the DCE.

Syntax:

Command	Responses
Action Command: AT+ICF=<format>[,<parity>]	OK
Read Command: AT+ICF?	AT+ICF: <format>,<parity> OK
Test Command: AT+ICF=?	AT+ICF: (list of supported <format>s), (list of supported <parity>s) OK

Values:

<format> Character Framing Format

- **1** 8 Data 2 Stop
  <parity> parameter is ignored
- **2** 8 Data 1 Parity 1 Stop
  If no <parity> provided, 3 is used by default as <parity> value
- **3** 8 Data 1 Stop
  <parity> parameter is ignored. **Default.**
- **4** 7 Data 2 Stop
  <parity> parameter is ignored
- **5** 7 Data 1 Parity 1 Stop
  If no <parity> provided, 3 is used by default as <parity> value
- **6** 7 Data 1 Stop
  <parity> parameter is ignored

<parity> Character Framing Parity

- **0** Odd
- **1** Even
- **2** Mark
- **3** Space
- **4** None. **Default.**

Parameter Storage: The <format> and <parity> parameters are stored in EEPROM using AT&W command. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+ICF=?	+ICF: (1-6),(0-4) OK Note: Possible values
AT+ICF=2,0	OK Note: New values
AT+ICF?	+ICF: 2,0 OK Note: Current values

Notes: All framing settings of the serial interface (i.e., 801, 8E1, 8S1, 8N1, 7N1, 7O1, 7E1, 7S1 and 7N2) are supported for autobaud mode.

If USB port is used:

- The action command is supported for compatibility reasons (but without effect).
- The response to the action command and the read command behavior is the same as if sent on UART1 or UART2.

+IFC DTE-DCE Local Data Flow Control

Description: This command is controls the operation of local flow control between the DTE and DCE.

Syntax:

Command	Responses
Action Command: AT+IFC=<DCE_by_DTE>,<DTE_by_DCE>	OK
Read Command: AT+IFC?	+IFC: <DCE_by_DTE>,<DTE_by_DCE>) OK
Test Command: AT+IFC=?	+IFC: (list of supported <DCE_by_DTE>s), (list of supported <DTE_by_DCE>s) OK

Values:

<DCE_by_DTE> Local Flow Control Parameter

- **0** None
- **2** RTS. **Default**

<DTE_by_DCE> Local Flow Control Parameter

- **0** None
- **2** CTS. **Default**

Parameter Storage: The <DCE_by_DTE> and <DTE_by_DCE> parameters are stored in EEPROM using AT&W.

Examples:

Command	Responses
AT+IFC=?	+IFC: (0,2),(0,2) OK Note: Possible values
AT+IFC=0,0	OK Note: New values
AT+IFC?	+IFC: 0,0 OK

Notes:

If USB port is used:

- The action command is supported for compatibility reasons (but without effect).
- The response to the action command is the same as if sent on UART1 or UART2 and the value of the both parameters is always 2.

When the <DCE_by_DTE> parameter is set to 2 (DTE prompts flow control through RTS), the DCE behavior is as follows:

- If the DCE has never detected RTS in the high (or ON) condition since startup, then it ignores RTS (assuming this signal is not connected).
- As soon as the DCE detects RTS high, the signal acts on it. Therefore, subsequent RTS transition to OFF will prevent the DCE from sending any further data in both online and offline modes.

This behavior allows the user to use the default settings (hardware flow control) and leaves RTS disconnected. In the case the RTS is connected and is high at least once, it acts on the DCE.

When the <DTE_by_DCE> parameter is set to 0 (none), the CTS is kept high all the time.

+IPR Set Fixed DTE Rate

Description: This command specifies the data rate at which the data circuit equipment (DCE) will accept commands.

Notes:

- The serial autobauding feature is supported for the following serial speeds only: 1200, 2400, 4800, 9600, 19200, 38400, 57600 115200, 230400, 460800, 921600 bps. Beyond those serial speeds, proper operation of the modem is not guaranteed.
- Any AT command issued by the DTE must start with both capital 'A' and 'T' (or '/') or both lower case 'a' and 't' (or '/'); otherwise, the DCE may return some garbage characters and become desynchronized. Should this happen, the DTE simply issues 'AT\r' (at 2400 or 4800 bauds) once or twice or just 'AT' (at 9600 bauds) to resynchronize the modem.
- The DTE waits for 1ms after receiving the last character of the AT response (which is always '\n' or 0x0A) to send a new AT command at either the same rate or a new rate. Should this delay be ignored, the DCE can become desynchronized. Once again, sending 'AT\r' once or twice or just 'AT' causes the DCE to recover.

Caution: When starting up, if autobauding is enabled and no AT command has yet been received, the product sends all unsolicited responses (like RING) at 9600 bauds.

Syntax:

Command	Responses
Action Command: AT+IPR=<rate>	OK
Read Command: AT+IPR?	+IPR: <rate> OK
Test Command: AT+IPR=?	+IPR: (list of auto-detectable <rate>s), (list of supported <rate>s) OK

Values:

<rate> Baud Rates That Can Be Used by the Data Circuit Equipment (DCE).

0 Enables autobauding. **Default**
300
600
1200
2400
4800
9600
19200
38400
57600
115200
230400
460800
921600

Parameter Storage: The <rate> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+IPR?	+IPR: 9600 OK Note: Current rate is 9600 bps
AT+IPR=?	+IPR: 1200,2400,4800,9600,19200,38400,57600,115200,230400,460800, 921600) , (0,300,600,1200,2400,4800,9600,19200,38400,57600,115200, 230400,460800,921600) OK Note: Possible values, according to V25 ter Recommendation: The first set of values indicates the range of auto-detectable baud rates. The second set of values indicates the baud rates supported by the DCE.
AT+IPR=38400	OK Note: Disable autobauding and set rate to 38400 bps
AT+IPR=0	OK Note: Enable autobauding

A Answer Incoming Call

Description: When the product receives a call, it sets the Ring Indicator signal and sends the ASCII "**RING**" or "**+CRING: <type>**" string to the application (+CRING if the cellular result code +CRC is enabled). Then it waits for the application to accept the call with the ATA command.

Syntax:

Command	Responses
Action Command: ATA	OK

No Read and Test Commands

Values: No parameters.

Examples:

Command	Responses
	RING Note: Incoming call
ATA Note: Answer to this incoming call	OK Note: Call accepted
ATH Note: Disconnect call	OK Note: Call disconnected

D Dial

Description: The ATD command sets a voice or data call. As per GSM 02.30, the dial command also controls supplementary services.

The Following Emergency Numbers Are Available without a SIM Card

000, 08, 110, 112, 118, 119, 911 and 999.

The Following Emergency Numbers Are Available with a SIM Card:

When the EF_ECC file is missing from SIM: 112 and 911.

When SIM includes an EF_ECC file: 112, 911 and any Emergency Numbers available in the EF_ECC file.

Syntax:

Command	Responses
Action Command: ATD<nb> [<I>] [<G>] [;]	[Depending on GSM sequence] OK/CONNECT<speed>/NO CARRIER/BUSY/NO ANSWER

No Read and Test Commands

Values:

<nb> **Destination Phone Number** (ASCII string) or GSM Sequence
0-9, *, #, +, A, B, C, D, P

<I> **CLIR Supplementary Service Subscription**
If present, the CLIR supplementary service subscription is overridden temporarily for this call only.
I Activate (disable presentation of own phone number to remote)
i Deactivate (enable presentation of own phone number to remote)

<G> **CUG Supplementary Service Information**
If present, the CUG supplementary service information is overridden temporarily for this call only.
G Activate
g Deactivate

; **For Voice Call**
If omitted, the call will be a data call.

<speed> **Data Call Connection Speed in bps**
300
1200
2400
4800
9600
14400

Examples:

Command	Responses
ATD0123456789; Note: Call the 0123456789 number, voice call	OK Note: Call succeeds
ATD0123456789P123; Note: Call the 0123456789 number, voice call with a pause and DTMF sequence 123	OK
ATD0123456789 Note: Call the 0123456789 number, data call	CONNECT 9600 Note: Call succeeds
ATD*#21# Note: Check any call forwarding status	+CCFC: 0,7 OK Note: No call forwarding

Notes:

- If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.
- For an international number, the local international prefix does not need to be set (usually 00) but must be replaced by the '+' character.
- Note that some countries may have specific numbering rules for their GSM handset numbering.
- When the FDN phonebook has been activated (see +CLCK command), only numbers beginning with the digits of FDN phonebook entries can be called. For example, if "014629" is entered in the FDN phonebook all the phone numbers beginning with these 6 digits can be called.
- An outgoing call attempt can be refused if the AOC service is active and credit has expired (NO CARRIER).
- As per GSM 02.30, GSM sequences may be controlled using dial commands. These sequences can contain "*", "#", but ";" is forbidden in the sequence. For example, to invoke or suppress CLIR service temporally, ATD*31#<nb>[;] and ATD#31#<nb>[;] can be used (with ';' at the end, a voice call will be launched).
- If the FDN phonebook is activated, the call forwarding sequences are allowed only if they are present in the FDN.

D› Originate a Call to Phone Number in Current Memory

Description: This command allows initiating an outgoing call directly from the current memory.

Syntax:

Command	Responses
Action Command: ATD>[<mem>]	OK / CONNECT <speed> / NO CARRIER / BUSY / NO ANSWER

No Read and Test Commands

Values:

<mem> **Memory Storage**
If omitted, the currently selected phonebook is used.

- **SM** ADN Abbreviated Dialing Numbers (SIM phonebook)
- **FD** FDN Fixed Dialing Numbers (SIM restricted phonebook)
- **ON** MSISDN (SIM own numbers)
- **EN** ECC Emergency Call Codes (SIM or Mobile Equipment)
- **LD** LND Last Number Dialed
- **MC** Missed (unanswered received) Calls list
- **ME** Mobile Equipment (flash) phonebook
- **MT** Combined Mobile Equipment & SIM phonebook (Mobile Equipment + SM)
- **RC** Received Calls list
- **SN** SDN Service Dialing Numbers (SIM special service numbers)

E Echo

Description: This command is used to determine whether or not the modem echoes characters received by an external application (DTE).

Syntax:

Command	Responses
Action Command: ATE<n>	OK

No Read and Test Commands

Values: **<n>** **Echo Activation Parameter**
- **0** Characters are not echoed. **Default** value if <n> is omitted.
- **1** Characters are echoed

Parameter Storage: The <n> parameter is stored in EEPROM using **AT&W**.

Examples:

Command	Responses
ATE0 Note: Characters are not echoed	OK Note: Done
ATE1 Note: Characters are echoed	OK Note: Done

H Disconnect Existing Connections

Description: The ATH (or ATH0) command disconnects the remote user. In the case of multiple calls, all calls are released (active, on-hold and waiting calls).

The specific ATH1 command disconnects the current outgoing call, only in dialing or alerting state (i.e., ATH1 can be used only after the ATD command and before its terminal response (OK, NO CARRIER, ...) It can be useful in the case of multiple calls.

Syntax:

Command	Responses
Action Command: ATH<n>	OK

No Read and Test Commands

Values: **<n>** **Disconnection Type**
- **0** Ask for disconnection (default value)
- **1** Ask for outgoing call disconnection

Examples:

Command	Responses
ATH Note: Ask for disconnection	OK Note: Every call, if any, is released
ATH1 Note: Ask for outgoing call disconnection	OK Note: Outgoing call, if any, is released

I Display Product Identification Information

Description: This command causes the product to transmit one or more lines of specific information text.

Syntax:

Command	Responses
ATI	ATI Manufacturer: Sierra Wireless, Incorporated Model: MC8790V Revision: K2_0_7_24BAP C:/WS/FW/K2_0_7_24BAP/MSM6290/SRC 2010/02/09 00:19:18 IMEI: 353626020734435 IMEI SV: 15 FSN: D680820228210 3GPP Release 6 +GCAP: +CGSM,+DS,+ES OK

O Switch from Command Mode to Data Mode

Description: This command allows you to return to data mode from command mode.

Syntax:

Command	Responses
Action Command: ATO	OK

No Read or Test Commands

S0 Set Number of Rings Before Automatic Answer

Description: This command sets the number of rings before automatically answering the call.

Syntax:

Command	Responses
Action Command: ATS0=<value>	OK
Read Command: ATS0?	<value> OK

Values: **<value>** **The number of rings before an automatic answer** (3 characters padded with zeros)
Range of values is 0 to 255. Default is 000.

Parameter Storage: The <value> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
ATS0=2 Note: Automatic answer after 2 rings	OK
ATS0? Note: Current value	002 OK Note: always 3 characters padded with zeros

S3 Set Command Line Termination Character

Description: This command is used to set the command line termination character on an incoming command line. The value is not persistent.

Syntax: **Command syntax:** ATS3=<value>

Command	Possible Responses
ATS3=13 Note: Set detection character to carriage return	OK

Values:
<char> Character decimal representation
1 – 127 Escape character (default is 13 or the carriage return character)

S4 Set Response Formatting Character

Description: This command sets the value of the AT defined character when formatting the result codes and information text. It is used together with the ATS3 command. The value is not persistent.

Syntax: **Command syntax:** ATS4=<value>

Command	Possible Responses
ATS4=10 Note: Set detection character to line feed	OK

Values:
<char> Character decimal representation
1 – 127 Escape character (default is 10 or the carriage return character)

S5 Set Command Line Editing Character

Description: This command sets the value of the defined character for deleting the immediately preceding character from the command line. The value is not persistent.

Syntax: **Command syntax:** ATS5=<value>

Command	Possible Responses
ATS5=8 Note: Set detection character to backspace	OK

Values:
<char> Character decimal representation
1 – 127 Escape character (default is 8 or the carriage return character)

S6 Set Pause Before Blind Dialing

Description: No effect for GSM.

Syntax:

Read Command:	ATS6?
Read Response:	<n> OK
Write Command:	ATS6=<n>
Write Response:	OK ERROR

Parameter Description:

<n>

002 – 10 Default is 002

S7 Set Number of Seconds to Wait for Connection Completion

Description: This command defines the maximum time allowed between completion of dialing and the connection being established. If this time is exceeded, then the connection is aborted. The value is not persistent.

Syntax: **Command syntax:** ATS7=<value>

Command	Possible Responses
ATS7=100	OK

Values: **<value>** Timeout in seconds
1 – 255 Default value is 50

S8 Set Number of Seconds to Wait When Comma Dial Modifier Is Used

Description: This command specifies the amount of time, in seconds, that the DCE shall pause, during signaling of call addressing information to the network (dialing), when a "," (comma) dial modifier is encountered in a dial string. No effect for GSM.

Syntax:

Read Command:	ATS8?
Read Response:	<n> OK
Write Command:	ATS8=<n>
Write Response:	OK ERROR

Parameter Description:

<n>

0	DCE does not pause when "," encountered in dial string.
1...255	Default = 2. Number of seconds to pause

S10 Automatic Disconnect Delay

Description: This command defines the duration of received-line-signal loss that the DCE tolerates. If the duration is exceeded, the DCE disconnects. The value is not persistent.

Syntax: **Command syntax:** ATS10=<value>

Command	Possible Responses
ATS10=10	OK

Values:

<value> Value in tenths of a second
1 – 254 Default value is 14 (or 1.4 seconds)
255 Ignore received-line-signal loss; do not disconnect

T Select Tone Dialing

Description: This command is used to select tone dialing. Not relevant to CDMA data services; "T" is not sent in dial string.

Syntax: **Command syntax:** ATT

Command	Possible Responses
ATT Note: select tone dialing.	OK Note: Command is valid

V Set Result Code Format Mode

Description: This command determines whether or not the Data Circuit Equipment (DCE) response format uses header characters <CR><LF> and whether the result codes are provided as numeric or verbose.

Syntax:

Command	Responses
Action Command: ATV<n>	OK

No Read and Test Commands

Values: **<n> Format Control Parameter**

	Information Responses	Result Code
0	<text><CR><LF>	<numeric code><CR>
1	<CR><LF> <text><CR><LF>	<CR><LF> **Default** <verbose code><CR><LF>

Parameter Storage: The <n> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
ATV0 Note: DCE transmits limited headers and trailers and numeric result codes	0 Note: Command is valid (0 means OK)
ATV1 Note: DCE transmits full headers and trailers and verbose response text	OK Note: Command valid

X Set Connect Result Code Format and Call Monitoring

Description: ATX determines whether or not the TA transmits particular result codes to the TE. It also controls whether or not the TA verifies the presence of a dial tone when it begins dialing, and whether or not engaged tone (busy signal) detection is enabled.

Syntax:

Exec. Command: ATX[<value>]
Exec. Response: OK
ERROR

Parameter Description:

<value>

0	CONNECT result code only returned. Dial tone and busy detection are both disabled. Default.
1	CONNECT <text> result code only returned. Dial tone and busy detection are both disabled.
2	CONNECT <text> result code returned. Dial tone detection is enabled; busy detection is disabled.
3	CONNECT <text> result code returned. Dial tone detection is disabled; busy detection is enabled.
4	CONNECT <text> result code returned. Dial tone and busy detection are both enabled. Default.

Z Set All Current Parameters to User-Defined Profile

Description: ATZ sets all current parameters to the default configuration. It does not change DCE baud rate or PDP context profiles.

Syntax:

Exec. Command: ATZ[<value>]
Exec. Response: OK

Parameter Description:

<value>

0	Reset to user profile

Supported 27.005 Commands

+CBM Cell Broadcast Message Directly Displayed

Description: This command is used to read the EF-CBMI SIM file. The EF-CBMI file is not used with the +CSCB command.

The application should read this file (using AT+WCBM?) and combine the Message Identifiers with those required by the application.

Syntax:

Command	Response
Action Command: AT+WCBM=<mids>	*OK*
Read Command: AT+WCBM?	+WCBM:<mids> OK

No Test Command

Values: **<mids>** **Message Identifiers**
Indicates type of message identifiers for which the mobile equipment should listen.

Examples:

Command	*Responses*
AT+WCBM="10,100,1000,10000" Note : Write 4 messages identifiers in EF-CBMI	OK Note : CBMIs are stored in EF-CBMI
AT+WCBM? Note : Read the CBMIs in EF-CBMI	+WCBM="10,100,1000,100000" OK Note : 4 CBMIs are stored in EF-CBMI

+CDS SMS Status Report After Sending an SMS

Description: This response indicates an SMS status report has been received and according to the message storage preferences (+CNMI), is to be directly displayed. +CDS is also used in the data compression functionality as an active command. Refer to Chapter 16 (U_m Interface Data Compression) for an explanation of +CDS usage for data compression.

Values:

<mr>	Message Reference
<ra>	Recipient Address
<tora>	Type-of-Address of <ra>
<scts>	Service Center Time Stamp in string format : “yy/MM/dd,hh :mm :ss±zz” (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<dt>	Discharge Time in string format: “yy/MM/dd,hh :mm :ss±zz” (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<st>	Status of a SMS-STATUS-REPORT (See Chapter 19)

Syntax: Response Syntax: +CDS: <mr>, [<ra>] , [<tora>], <scts>,<dt>,<st> (Text mode)

Example Result
+CDS : 2, 116, ”3146290800”, 129, “98/10/01,12 :30 :07+04”, “98/10/01 12 :30 :08+04”, 0 Note: SMS status report received

+CDSI Incoming SMS Status Report

Description: This response indicates an SMS status report has been received and according to the message storage preferences (+CNMI), is to be stored in memory.

Values:
<mem> NVRAM storage area (always "SR" for this response)
<index> location of message within storage area

Syntax: Response syntax: +CDSI: <mem>,<index>

Example Result
+CDSI: "SR",5 Note: SMS status report received and stored in "SR" memory at index 5

+CMGC Send an SMS

Description: The **write command** transmits a short message from TE to network (SMS-SUBMIT).

After invoking the write command, wait for the prompt ">", and then start to write the message. To send the message, simply enter <CTRL-Z>. After the prompt, a timer will be started to observe the input.

To abort sending, use **<**ESC>. Abortion is acknowledged with "OK", though the message will not be sent.

The message reference <mr> is returned to the TE on successful message delivery. The value can be used to identify the message in a delivery status report provided as an unsolicited result code.

Syntax:

Test Command: AT+CMGS=?
Test Response: OK

Write Command: If text mode (see AT+CMGF=1)
AT+CMGS=<da>[, <toda>]***<CR>*** Text can be entered. ***<CTRL-Z>/<ESC>***
Write Response: +CMGS: <mr>[, <scts>]
OK
ERROR
+CMS ERROR <err>

Write Command: If PDU mode (see AT+CMGF=0)
AT+CMGS=<length>***<CR>*** PDU can be entered. ***<CTRL-Z>/<ESC>***
Write Response: +CMGS: <mr>[, <ackpdu>]
OK
ERROR
+CMS ERROR <err>

+CMGD Delete Message

Description: This command deletes one or several messages from preferred message storage ("BM" SMS-CB "RAM storage", "SM" SMSPP storage, "SIM storage" or “SR” SMS Status-Report storage).

Refer also to the Preferred Message Storage +CPMS command.

Syntax:

Command	Responses
Action Command: AT+CMGD=<Index> [,<DelFalg>]	OK

No Read and Test Commands

Values:

<index> **Index of Messages to be Deleted**

If <DelFlag>=0

1-20 If the preferred message storage is “BM”
If <DelFlag> is > 0, <index> is ignored

SIM Values
If the preferred message storage is "SM" or "SR".

<DelFlag> **Message Deletion Mode**

0 Delete message at location <index>. Default.
If <DelFlag> is omitted, the default value is used.

1 Delete All READ messages

2 Delete All READ and SENT messages

3 Delete All READ, SENT and UNSENT messages

4 Delete All messages.

Examples:

Command	Responses
	+CMTI:”SM”,3 Note: New message received
AT+CMGR=3 Note: Read it	+CMGR: “REC UNREAD”,”0146290800”,“98/10/01,18:19:20+00” <CR><LF> Message received! Note: Unread message received from 0146290800 on the 01/10/1998 at 18H19m 20s
AT+CMGD=3 Note: Delete it	OK Note: Message deleted
AT+CMGD=1,0	OK Note: The message from the preferred message storage at the location 1 is deleted
AT+CMGD=1,1	OK Note: All READ messages from the preferred message storage are deleted
AT+CMGD=1,2	OK Note: All READ messages and SENT mobile originated messages are deleted
AT+CMGD=1,3	OK Note: All READ, SENT and UNSENT messages are deleted
AT+CMGD=1,4	OK Note: All messages are deleted

+CMGF Message Format

Description: This command selects the preferred message format. The message formats supported are:
Text mode
PDU mode

Syntax:

Command	Responses
Action Command: AT+CMGF<mode>	OK

Read Command: AT+CMGF?	+CMGF: <mode> OK

Test Command: AT+CMGF=?	+CMGF: (list of supported <mode>s) OK

Values: **<mode> Text Mode or PDU Mode**
0 PDU mode
1 Text mode. **Default**

Parameter Storage: The <mode> parameter is stored in EEPROM using the AT+CSAS command. The default can be restored using AT&F.

Examples:

Command	Responses
AT+CMGF ? Note: Current message format	+CMGF: 1 OK Note: Text mode
AT+CMGF=? Note: Possible message format	+CMGF: (0,1) OK Note: Text or PDU modes are available
AT+CMGF=0 Note: Set PDU mode	OK Note: PDU mode valid

+CMGL List Messages

Description: This command allows the application to read stored messages by indicating the type of the message to read. The messages are read from the memory selected by the **+CPMS** command.

Syntax: Depending on the mode, several responses are possible:

For SMS-DELIVER or SMS-SUBMIT and Text Mode:

Command	Responses
Action Command: AT+CMGL=<stat>	+CMGL: <index>,<stat>,<da/oa>,[<alpha>], [<scts>, <tooa/toda>, <length>] <data> [+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>,<tooa/toda>, <length>]<data>[…]]

For SMS-STATUS-REPORT and Text Mode:

Action Command: AT+CMGL=<stat>	+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> [+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st>[…]] OK

For PDU Mode:

Action Command: AT+CMGL=<stat>	+CMGL: <index>,<stat>, [<alpha>], <length> <pdu> [+CMGL: <index>,<stat>, [<alpha>], <length> <pdu> […]] OK

No Read and Test Commands

Values:

<da> **Destination Address**
String format

<toda> **Type of Address of <da>**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<dt> **Discharge Time**
String format: "yy/MM/dd,hh:mm:ss±zz" (year [00-99]/ month [01-12]/Day [01-31], Hour:Min:Second and TimeZone [quarters of an hour])

<oa> **Originator Address**
String type

<tooa> **Type of Address of <oa>**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<scts> **Service Center Time Stamp**
String format: "yy/MM/dd,hh:mm:ss±zz"
(Year/Month/Day,Hour:Min:Seconds±TimeZone)

<fo> **First Byte of SMS-DELIVER, SMS-SUBMIT or SMS-STATUS-REPORT**
Integer type

<pid> **Protocol Identifier**
Integer type

<index> **Place of Storage in Memory**
Integer type

<length> **Text Mode** (AT+CMGF=1): Number of Characters
PDU Mode (AT+CMGF=0): Length of the TP Data Unit in Bytes
Integer type

<mr> **Message Reference**
Integer type

<ra> **Recipient Address**
String type

<sca> **Service Center Address**
String type

<st> **Status of a SMS-STATUS-REPORT**
Integer type

+CMGR Read Message

Description: This command allows the application to read stored messages. The messages are read from the memory selected by the **+CPMS** command.

Syntax: Depending on the mode, several responses are possible:

For SMS-DELIVER and Text Mode:

Command	Responses
Action Command: AT+CMGR=<index>	+CMGR: <stat>,<oa>,[<alpha>,]<scts>[,<tooa>,<fo>,<pid>,<dcs>, <sca>,<tosca>,<length>] <data> OK

For SMS-SUBMIT and Text Mode:

Action Command: AT+CMGR=<index>	+CMGR: <stat>,<da>,[<alpha>,][,<toda>,<fo>,<pid>,<dcs>, [<vp>],<sca>,<tosca>,<length>] <data> OK

For SMS-STATUS-REPORT and text mode:

Action Command: AT+CMGR=<index>	+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> OK

For PDU Mode:

Action Command: AT+CMGR=<index>	+CMGR: <stat>,[<alpha>],<length> <pdu> OK

No Read and Test Commands

Values:

<da> **Destination Address**
String format

<toda> **Type of Address of <da>**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<dcs> **Data Coding Scheme**
Integer type

<dt> **Discharge Time**
String format: "yy/MM/dd,hh:mm:ss±zz" (year [00-99]/ month [01-12]/Day [01-31], Hour:Min:Second and TimeZone [quarters of an hour])

<oa> **Originator Address**
String type

<tooa> **Type of Address of <oa>**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<scts> **Service Center Time Stamp**
String format: "yy/MM/dd,hh:mm:ss±zz"
(Year/Month/Day,Hour:Min:Seconds±TimeZone)

<fo>: **First Byte of SMS-DELIVER, SMS-SUBMIT or SMS-STATUS-REPORT**
Integer type

<pid> **Protocol Identifier**
Integer type

<index> **Place of Storage in Memory**
Integer type

<length> **Text Mode** (AT+CMGF=1): Number of Characters
PDU Mode (AT+CMGF=0): Length of the TP Data Unit in Bytes
Integer type

<mr> **Message Reference**
Integer type

<pdu> **SMS User Data in PDU Mode**
String type (hexadecimal format)

<ra> **Recipient Address**
String type

<sca> **Service Center Address**
String type

<st> **Status of a SMS-STATUS-REPORT**
Integer type

<stat> **Status of Message in Memory (PDU Mode)**
0 Received unread messages
1 Received read messages
2 Stored unsent messages
3 Stored sent messages

<stat> **Status of Message in Memory (Text Mode)**
"REC UNREAD" Received unread messages
"REC READ" Received read messages
"STO UNSENT" Stored unsent messages
"STO SENT" Stored sent messages

<tora> **Type of Address of <ra>**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<tosca> **Type of Address of <sca>**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<alpha> **Associated Phonebook Name**
String type

<data> **SMS User Data in Text Mode**
String type

<vp> **Validity Period**
In text mode is only coded in "relative" format.
This means that one byte can describe different values.
0 to 143 (VP + 1) x 5 minutes (up to 12 hours)
144 to 167 12 hours + ((VP – 143) x 30 minutes)
168 to 196 (VP – 166) x 1 day
197 to 255 (VP – 192) x 1 week

Examples:

Command	Responses
	AT+CMTI: "SM",1 Note: New message received
AT+CMGR=1 Note: Read the message	+CMGR: "REC UNREAD", "0146290800","98/10/01,18:22:11+00" ABCdefGHI OK
AT+CMGR=1 Note: Read the message again	+CMGR: "REC READ", "0146290800","98/10/01,18:22:11+00" ABCdefGHI OK Note: Message is read now
AT+CMGR=2	OK Note: Location empty

Command	Responses
AT+CMGF=0 ;+CMGR=1 Note: In PDU mode	+CMGR: 2,,26 07913366003000F3040B913366920547F400130 01190412530400741AA8E5A9C5201 OK Note: Message is stored but unsent, no <alpha>field
AT+CMGF=1;+CPMS="SR";+CNMI=,, ,2 Note: Reset to text mode, set read memory to "SR", and allow storage of further SMS Status Report into "SR" memory	OK
AT+CMSS=3 Send an SMS previously stored	+CMSS: 160 OK
	+CDSI: "SR",1 New SMS Status Report stored in "SR" memory at index 1
AT+CMGR=1 Note: Read the SMS Status Report	+CMGR: "REC UNREAD",6,160, "+33612345678",129, "01/05/31,15:15:09+00", "01/05/31,15:15:09+00",0 OK

+CMGS Send Message

Description: This command allows the user application to send short messages to the network. The text can contain all existing characters except <ctrl-Z> and <ESC> (ASCII 27).This command can be aborted using the <ESC> character when entering text.

In PDU mode, only hexadecimal characters are used ("0"…"9","A"…"F").

Syntax:

In Text Mode:

Command	Responses
Action Command: AT+CMGS=<da>[,<toda>]<CR> > "text to be sent <Ctrl-Z>"	+CMGS: <mr> OK

In PDU Mode:

Action Command: AT+CMGS=<length><CR> > "PDU to be sent <Ctrl-Z>"	+CMGS: <mr> OK

No Read and Test Commands

Values:

<da> **Destination Address**
string type

<toda> **Type of Address of <da>**

<length> **Text Mode** (AT+CMGF=1): number of characters
PDU mode (AT+CMGF=0): length of the TP data unit in bytes
integer type

<mr> **Message Reference**
integer type

Examples:

Command	Responses
AT+CMGS="+33146290800"<CR> ---------- Please call me soon, Fred. <ctrl-Z> Note: Send a message in text mode ----------	> ---------- ---------- +CMGS: <250> OK Note: Successful transmission
AT+CMGS=<length><CR> Note: Send a message in PDU mode (1/3) ---------- <pdu> Note: Enter message in PDU mode (2/3) ---------- <ctrl-Z> Note: End the message (3/3)	> ---------- ---------- +CMGS: <251> OK Note: Successful transmission

+CMGW Write Message to Memory

Description: This command stores a message in memory (either SMS-SUBMIT or SMS-DELIVERs). The memory location <index> is returned (no choice possible as with phonebooks +CPBW). Text or PDU is entered as described for the Send Message +CMGS command.

Syntax: Depending on the mode, two syntax commands are available.

In Text Mode:

Command	Response
Action Command: AT+CMGW= <oa/da> [,<tooa/toda> [,<stat>]] <CR> > Enter text <ctrl-Z / ESC>	OK

In PDU Mode:

Action Command: AT+CMGW= <length> [,<stat>] <CR> > Give PDU: <ctrl-Z / ESC>	OK

No Read and Test Commands

Values:

<oa/da> **Originating or Destination Address Value**
String format

<toda> **Type of Address of <da>**
When the first character of <da> is "+", the **default is 145**; otherwise, it is **129**.
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<tooa> **Type of Address of <oa>**
When the first character of <oa> is "+", the **default is 145**; otherwise, it is **129**.
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<stat> **Status of Message in Memory (PDU Mode)**
- **0** Received unread messages
- **1** Received read messages
- **2** Stored unsent messages
- **3** Stored sent messages

<stat> **Status of Message in Memory (Text Mode)**
- **"REC UNREAD"** Received unread messages
- **"REC READ"** Received read messages
- **"STO UNSENT"** Stored unsent messages
- **"STO SENT"** Stored sent messages

<length> **Length of the actual data unit in bytes**
Integer type

Examples:

Command	Responses
AT+CMGW="+33146290800"<CR> ---------- Hello how are you ? <ctrl-Z> Note: Write a message in text mode ----------	> ---------- ---------- +CMGW: 4 OK Note: Message stored in index 4
AT+CMGW=<length><CR> Note: Write a message in PDU mode (1/3) ---------- <pdu> Note: Enter message in PDU mode (2/3) ---------- <ctrl-Z> Note: End the message (3/3)	> ---------- -- ---------- -- +CMGW: <index> OK Note: Message stored in <index>

+CMMS More Messages to Send

Description: This command allows the link to be kept open while sending several short messages within a short delay.

Syntax:

Command	Responses
Action Command: AT+CMMS=<mode>	OK

Read Command: AT+CMMS?	+CMMS: <mode> OK

Test Command: AT+CMMS=?	+CMMS: (list of supported <mode>s) OK

Values:

<mode> Operating Mode

0 Disable feature

1 Keep link opened while messages are sent.
If the delay between two messages exceeds 5 seconds, the link is closed and the mode is reset to *0: the feature is disabled*.

2 Keep link opened while messages are sent.
If the delay between two messages exceeds 5 seconds, the link is closed but the mode remains set to *2: the feature is still enabled*.

Examples:

Command	Responses
AT+CMMS=?	+CMMS: (0-2) OK
AT+CMMS=2 Note: Enable feature	OK Note: Feature is enabled; link is open
AT+CMMS?	+CMMS: 2 OK

Notes:

- The delay of 5 seconds complies with Recommendation 3GPP TS 27.005.
- Before sending the **last** SMS in the link, you **must use** the **AT+CMSS=0** command. This command will indicate that the next SMS will be the last one.

+CNMA New Message Acknowledgement to ME/TE

Description: The write / execute command confirms successful receipt of a new message (SMS-DELIVER or SMS-STATUS-REPORT) routed directly to the TE. If ME does not receive acknowledgment within required time (network time-out), ME sends RP-ERROR to the network. TA shall automatically disable routing to TE by setting both <mt> and <ds> values of AT+CNMI to zero.

Syntax:

Test Command: AT+CNMA=?
Test Response: +CNMA: (list of supported <n>s)
OK

Exec. Command: AT+CNMA
Exec. Response: OK
ERROR
+CMS ERROR <err>

Write Command: AT+CNMA=<n>
Write Response: OK
ERROR
+CMS ERROR: <err>

Parameter Description:

<n> Parameter required only for PDU mode.
0 Command operates similarly as in text mode.
1 Send positive (RP-ACK) acknowledgement to the network. Accepted only in PDU mode.
2 Send negative (RP-ERROR) acknowledgement to the network. Accepted only in PDU mode.

Note:

The execute / write command shall only be used when AT+CSMS parameter <service> equals 1 (= phase 2+) and appropriate URC has been issued by the module; i.e.:

<+CMT> for <mt>=2 incoming message classes 0,1,3 and none;

<+CMT> for <mt>=3 incoming message classes 0 and 3;

<+CDS> for <ds>=1.

+CMS ERROR Message Service Failure Result Code

<er>	Meaning	Resulting from the following commands
1 to 127	Error cause: values	+CMGS, +CMSS
301	SMS service of ME reserved	+CSMS (with +CMS: ERROR 301)
302	Operation not allowed	All SMS commands
303	Operation not supported	All SMS commands
304	Invalid mode parameter	+CMGS, +CMGW
305	Invalid text mode parameter	+CMGS, +CMGW, +CMSS
313	SIM failure	All SMS commands
321	Invalid memory index	+CMGR, +CMSS, +CMGD
322	SIM or modem memory full	+CMGW
330	SC address unknown	+CMSS, +CMGS
340	no +CNMA acknowledgement expected	+CNMA

+CMSS Send Short Messages from Storage

Description: The write command sends message with location value <index> from message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code.
If the optional parameter <da> is given, the old status of the short message at <index> remains unchanged (see <stat>).

Syntax:

Test Command: AT+CMSS=?
Test Response: OK

Write Command: If text mode (AT+CMGF=1):
AT+CMSS=<index>[, <da>[, <toda>]]
Write Response: +CMSS: <mr>[, <scts>]
OK
If sending fails
ERROR
+CMS ERROR: <err>

Write Command: If PDU mode (AT+CMGF=0):
AT+CMSS=<index>[, <da>[, <toda>]]
Write Response: +CMSS: <mr>[, <ackpdu>]
OK
ERROR
+CMS ERROR: <err>

+CMT Incoming Message Directly Displayed

Description: This response indicates that an incoming message has been received and according to the message storage preferences (+CNMI), is to be directly displayed.

Syntax: **Response syntax:** +CMT: <oa>, <scts>, <tooa>, <lang>, <encod>, <priority> [,<cbn>], <length> <CR><LF> <data> (text mode)

Example Result
+CMT: “123456”,”98/10/01,12 :30 00”,129,1,2,0,5<CR><LF> Hello Note: message received

Values:

<oa> Originator Address.
<scts> Service Center Time Stamp in string format : “yy/MM/dd,hh :mm :ss±zz” (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<tooa> Type-of-Address of <oa>
<lang> Language
<encod> Encoding method
<priority> Message priority:
0 – Normal
1 – Interactive
2 – Urgent
3 – Emergency
<cbn> Call Back Number
<length> The number of characters in the following <data> field
<data> Message contents

+CMTI Incoming Message Stored in Memory

Description: This response indicates that an incoming message has been received and according to the message storage preferences (+CNMI), is to be stored in memory.

Syntax: **Response syntax:** +CMTI: <mem>,<index>,<priority>

Example Result
+CMTI: "MT",1,0 Note: Message received

Value:

<mem> NVRAM storage area (always "MT" for this response)

<index> Location of message within storage area

<priority> Message priority

- **0** – Normal
- **1** – Interactive
- **2** – Urgent
- **3** – Emergency

+CNMI New Message Indication

Description: This command selects the procedure for message reception from the network. **Note:** Cell Broadcast messages and Status Report messages are not stored.

Syntax: **Command syntax:** AT+CNMI=<mode>,<mt>,<bm>,<ds>,<bfr>

Command	Possible Responses
AT+CNMI=2,1,0,0,0 Note: <mt>=1	OK
	AT+CMTI : "MT",1 Note: message received
AT+CNMI=2,2,0,0,0 Note: <mt>=2	OK
	+CMT : "8585551212","98/10/01,12 :30 00", 129,1,2,0,5<CR><LF> Hello Note: message received
AT+CNMI=2,0,0,1,0 Note: <ds>=1	OK
AT+CMGS="8585551212"<CR> Message to send <ctrl-Z> Note: Send a message in text mode	+CMGS : 7 OK Note: Successful transmission
	+CDS : 2, 116, "8585551212", 129, "98/10/01,12 :30 :07", "98/10/01 12 :30 :08", 32768 Note: message was correctly delivered

Values

<mode> The <mode> value controls the processing of unsolicited result codes. Only mode 2 is supported at this time.

2 Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation. Otherwise forward the messages directly to the TE without storing.

<mt> Sets the result code indication routing for SMS-DELIVERs. Default is 1.

0 No SMS-DELIVER indications are routed.

1 SMS-DELIVERs are routed using unsolicited code: +CMTI: "MT", <index>

2 or 3 SMS-DELIVERs (except class 2 messages) are routed using unsolicited code: +CMT: <oa>, <scts>, <tooa>, <lang>, <encod>, <priority>[,<cbn>],<length><CR><LF><data> (text mode)

<bm> Sets the result code indication routing for received Cell Broadcast Messages. Default is 0.

- **0** No CBM indications are routed to the TE. The CBMs are **not** stored.
- **2 or 3** New CBMs are routed directly to the TE using unsolicited result code (format matches that of +CBM: <oa>, [<alpha>,] <scts> [,<tooa>, <length>] <CR><LF><data> (text mode)

<ds> Sets the routing for SMS-STATUS-REPORTs. Default is 0.

- **0** No SMS-STATUS-REPORTs are routed.
- **1** SMS-STATUS-REPORTs are routed using unsolicited code: +CDS: <fo>, <mr>, [<ra>] , [<tora>], <scts>, <dt>, <st> (Text mode)

<bfr> Since <mode> cannot be changed, this parameter is no longer used, but these values are still accepted for legacy purposes. Default is 0.

- **0** TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1…3 is entered (OK response shall be given before flushing the codes)
- **1** TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1…3 is entered.

+CPMS Preferred Message Storage

Description: This command allows the message storage area to be selected (for reading, writing, etc). The total storage area size is: 100 for "MT". In the future when the RUIM is supported, the size will vary dependent on the configuration of the SIM card.

Syntax: **Command syntax:** AT+CPMS=<mem1>,<used>,<total>

Command	Possible Responses
AT+CPMS=? Note: Display available message storage areas.	+CPMS: ("MT") OK
AT+CPMS? Note: Display currently selected area information.	+CPMS: "MT",3,99 OK
AT+CPMS="BC" Note: Select invalid message storage area.	+CMS ERROR: 302
AT+CPMS="MT" Note: Select NV message storage	+CPMS: 0,99 OK

Values:

<mem1> Memory area to be used to list, read and delete messages. It can be:

- **"MT"** SMS Mobile Terminated message storage in NV (default)
  Each reported memory area includes information about current used & total storage locations. When <mem1> is selected, all following +CMGL, +CMGR and +CMGD commands are related to the type of SMS stored in this memory.

<used> The number of used storage locations in the reported area.

<total> The total number of available storage locations.

+CSCA SMS Service Center Address

Description: The **write command** updates the SMSC address, through which mobile originated SMs are transmitted.

Syntax:

Test Command:	AT+CSCA=?
Test Response:	OK
Read Command:	AT+CSCA?
Read Response:	+CSCA: <sca>, <tosca> OK
Write Command:	AT+CSCA=<sca>[, <tosca>]
Write Response:	OK

Notes:

- This command writes the service center address to non-volatile memo.
- The SMS service center address should be entered as specified by the service provider.

+CSCB Select Cell Broadcast Message Indication

Description: The test command returns the supported <operation>s as a compound value. The read command displays the accepted message types. Depending on the <operation> parameter, the write command adds or deletes the message types accepted by the ME.

Syntax:

Test Command: AT+CSCB=?
Test Response: +CSCB: (list of supported <operation>s)
OK
ERROR
+CMS ERROR: <err>

Read Command: AT+CSCB?
Read Response: +CSCB: <operation>, <mids>, <dcss>
OK
ERROR
+CMS ERROR: <err>

Write Command: AT+CSCB=[<operation>[, <mids>[, <dcss>]]]
Write Response: OK
ERROR
+CMS ERROR: <err>

Parameter Descriptions:

<operation>
Add/delete operation

0 Default. Add new message types defined in <mids> to the list of accepted message types by ME and replace types defined in <dcss>. In case of using this operation code without parameters default (0-65535) range will be added to the list of <mids>.

1 Delete message types defined in <mids> from the list of accepted message types by ME and replace types defined in <dcss>. In case of using this operation code without parameters all <mids>s and <dcss>s will be deleted. (For more, see notes.)

<mids>
Cell Broadcast Message ID specification
All different possible combinations of CBM message identifiers; e.g., “0,1,5,320-478,922”).

<dcss>
All different possible combinations of CBM data coding schemes (e.g., "0-3,5"). If default empty string is used, all CBMs are received independent of their dcss.
A given <dcss> replaces any former value and is used for consecutive requests.

Note:

The <operation> parameter shown in the AT+CSCB read command response retains the value last used in the Write command. This way, the read command response always reflects the last action done: 0 means that the last action was adding new channel(s), 1 means that the last action was deleting channel(s).

+CSDH Show Text Mode Parameters

Description: This command gives additional information about text mode result codes. This information can be found in the description of the +CMT, +CMGR, +CMGL commands and responses.

Syntax:

Command	Responses
Action Command: AT+CSDH=<n>	OK

Read Command: AT+CSDH?	+CSDH: <n> OK

Test Command: AT+CSDH=?	+CSDH: (list of supported <n>s) OK

Values: **<n>** **Show Text Mode**
- **0** Do not show header values. **Default**
- **1** Show the values in result codes

Parameter Storage: The parameter <n> is stored using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CSDH=0 Note: Set value to "do not show"	OK
AT+CSDH? Note: Current value	+CSDH: 0 OK Note: Do not show header values
AT+CSDH=?	+CSDH: (0,1) OK

+CSMP Set Text Mode Parameters

Description: This command selects values for <vp>, <pid>, and <dcs> and configures the text mode.

Syntax:

Command	Responses
Action Command: AT+CSMP=<fo>, <vp>, <pid>,<dcs>	OK

Read Command: AT+ SMP?	+CSMP: <fo>, <vp>, <pid>,<dcs> OK

No Test Command

Values: **<fo>** **The <fo> byte comprises 6 fields:**

b7	b6	b5	b4	b3	b2	b1	b0
RP	*UDHI*	*SRR*	*VPF*		*RD*	*MTI*	

RP Reply Path, not used in text mode.

UDHI User Data Header Information.
b6=1 if the beginning of the User Data field contains a Header in addition to the short message. This option is not supported in +CSMP command, but can be used in PDU mode (+CMGS).

SRR Status Report Request.
b5=1 if a status report is requested. This mode is supported.

VPF Validity Period Format
b4=0 & b3=0 -> <vp> field is not present
b4=1 & b3=0 -> <vp> field is present in relative format
Others formats (absolute & enhanced) are not supported.

RD Reject Duplicates.
b2=1 to instruct the SC to reject an SMS-SUBMIT for an SM still held in the SC that has the same <mr> and the same <da> as the previously submitted SM from the same <oa>.

MTI Message Type Indicator
b1=0 & b0=0 -> SMS-DELIVER (in the direction SC to MS)
b1=0 & b0=1 -> SMS-SUBMIT (in the direction MS to SC)

<vp> Validity Period
In text mode <vp> is only coded in "*relative"* format.
The default value is 167 (24 hours). This means that one byte can describe different values:

VP value	Validity period value
0 to 143	(VP + 1) x 5 minutes (up to 12 hours)
144 to 167	12 hours + ((VP – 143) x 30 minutes)
168 to 196	(VP – 166) x 1 day
197 to 255	(VP – 192) x 1 week

<pid> Protocol ID
String type

<dcs> Data Encoding Scheme
Integer type

Parameter Storage: The <vp> parameter is stored in E2P using the AT+CSAS command. The default can be restored using AT&F.

Examples:

Command	Responses
AT+CSMP? Note: current values	+CSMP: 0,0,0,0 OK Note: No validity period <dcs>= PCCP437 alphabet (8 bits → 7 bits)
AT+CMPS=17,23,64,244 Note: <vp> = 23 (2 hours, relative format) <dcs> = GSM 8 bits alphabet Reminder: Enter <fo> value in decimal format	OK

+CSMS Select Message Service

Description: This command defines the availability of the SMS services and the SMS AT commands. The Supported Services include:

SMS-MO Originated short messages
SMS-MT Terminated short messages
SMS-CB Cell Broadcast Message services

Syntax:

Command	Responses
Action Command: AT+CSMS=<service>	+ CSMS: <mt>,<mo>,<bm> OK
Read Command: AT+ CSMS?	+ CSMS: <service>,<mt>,<mo>,<bm> OK
Test Command: AT+ CSMS=?	+ CSMS: (list of supported <service>s) OK

Values:

<service> Selected Service
0 SMS AT commands are compatible with GSM 07.05 Phase 2 version 4.7.0. Default
1 SMS AT commands are compatible with GSM 07.05 Phase 2 +

<mt> SMS-MT Support
0 SMS-MT not supported
1 SMS-MT supported

<mo> SMS-MO Support
0 SMS-MO not supported
1 SMS-MO supported

<bm> SMS-BM Support
0 SMS-BM not supported
1 SMS-BM supported

Parameter Storage: The <service> parameter is stored in EEPROM using AT&W. The default can be restored using AT&F.

Examples:

Command	Responses
AT+CSMS=0	+CSMS: 1,1,1 OK Note: SMS-MO, SMS-MT and SMS-CB supported
AT+CSMS? Note: Get current values	+CSMS: 0,1,1,1 OK
AT+CSMS=? Note: Possible services	+CSMS: (0,1) OK

Supported 3GPP TS 27.007 Commands

+CBST Bearer Type Selection

Description: This command allows the selection of a bearer type for both outgoing and incoming data calls.

Syntax:

Command	Responses
Action Command: AT+CBST= [<speed>] [,<name>] [,<ce>]]	OK
Read Command: AT+CBST?	+CBST: <speed>,<name>,<ce> OK
Test Command: AT+CBST=?	+CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s) OK

Values:

<speed> **Data Call Connection Speed**
Used Only for Outgoing Calls

0 (default)	Autobauding	(modem type: none)
1	300 bps	(modem type: V.21)
2	1200 bps	(modem type: V.22)
3	1200/75 bps	(modem type: V.23)
4	2400 bps	(modem type: V.22bis)
5	2400 bps	(modem type: V.26ter)
6	4800 bps	(modem type: V.32)
7	9600 bps	(modem type: V.32)
8	Specific	
12	9600 bps	(modem type: V.34)
14	14400 bps	(modem type: V.34)
65	300 bps	(modem type: V.110)
66	1200 bps	(modem type: V.110)
68	2400 bps	(modem type: V.110)
70	4800 bps	(modem type: V.110)
71	9600 bps	(modem type: V.110)
75	14400 bps	(modem type: V.110)

<name> **Operating Mode**

0 Default	No data compression is provided and only asynchronous mode is supported.

<ce> **Connection Element**

0	Transparent only
1 Default	Non transparent only
2	Transparent preferred
3	Non transparent preferred

+CCFC Call Forwarding

Description: This command allows control of the call forwarding supplementary service.

Syntax:

Command	Response
Action Command: AT+CCFC= <reason>, <mode> [,<number> [,<type> [,<class> [,<subaddr> [,<satype> [,<time>]]]]]]	[+CCFC: <status>, <class> [,<number>, <type> [,<subaddr>, <satype> [,<time>]]] […]] OK
Test Command: AT+CCFC=?	+CCFC: (list of supported <reason>s) , OK

No Read Command

Values:

<reason> **Call Forwarding Reason**
- **0** Unconditional
- **1** Mobile busy
- **2** No reply
- **3** Not reachable
- **4** All call forwarding
- **5** All conditional call forwarding

<mode> **Requested Operation**
- **0** Disable
- **1** Enable
- **2** Interrogate
- **3** Registration
- **4** Erasure unconditional

<number> **Phone Number**
String type

<type> **TON/NPI Type of Address Octet** (Integer type)
The **default is 145** when the dialing string includes the international access code character "+"; otherwise, it is **129**.
- **129** ISDN / telephony numbering plan, national / international unknown. <number> does not include the international access code character "+"
- **145** ISDN / telephony numbering plan, international number. <number> includes the international access code character "+"
- **161** ISDN / telephony numbering plan, national number
- **128-255** Other values (refer GSM 04.08 section 10.5.4.7)

<class> **Call Class**
The combination of different classes is not supported. It will only result in the activation / deactivation / status request of all classes.
- **1** Voice
- **2** Data
- **7** Voice, data. **Default if value is omitted.**
- **8** Short messages

<time> **Time to Wait**
- **1-30** For <reason> = 2 (No reply), 4 (all call forwarding) and 5 (all conditional call forwarding), time to wait (1 to 30) in seconds before call is forwarded. **Default=20**

<status> **Call Forwarding Status**
- **0** Not active
- **1** Active

Parameter Storage: None

Examples:

Command	Responses
AT+CCFC=0,3,"0146290800" Note: Register to an unconditional call forwarding for all classes	OK
AT+CCFC=0,2 Note: Interrogate unconditional call forwarding	+CCFC:1,1,"0146290800",129 Note: Call forwarding active for voice +CCFC:1,2,"0146290800",129 Note: Call forwarding active for data
AT+CCFC=0,4 Note: Erase unconditional call forwarding	OK

+CCUG Closed User Group

Description: This command is used to:

- Activate/deactivate the control of CUG information for all following outgoing calls
- Select a CUG index
- Suppress Outgoing Access (OA). OA allows/disallows a member of a CUG to place calls outside the CUG
- Suppress the preferential CUG. *Preferential* is the default CUG used by the network when it does not receive an explicit CUG index

The Closed User Group Supplementary Service enables subscribers to form closed user groups with restricted access (both access to and from).

The CUG supplementary service is described in GSM 02.85. This service is provided on prior arrangement with the service provider. Subscription options should be selected at implementation.

Syntax:

Command	Response
Action Command: AT+CCUG = <n> [,<index> [<info>]]	OK
Read Command: AT+CCUG?	+CCUG: <n>,<index>,<info> OK
Test Command: AT+CCUG=?	OK

Values:

<n> **CUG Activation Mode**
- **0** Disable CUG mode. **Default**
- **1** Enable CUG mode

<index> **CUG Index**
- **0-9** Selected default value **0 = Default**
- **10** Preferred

<info> **Actions**
- **0** No information. **Default**
- **1** Suppress OA
- **2** Suppress preferential CUG
- **3** Suppress OA and preferential CUG

Parameter Storage: All parameters are stored in EEPROM without using AT&W.

Examples:

Command	Responses
AT+CCUG=0,0,0	OK
AT+CCUG?	+CCUG: 0,0,0 OK

+CCWA Call Waiting

Description: This command controls the call waiting supplementary service. The product will send a +CCWA unsolicited result code when the call waiting service is enabled.

Syntax:

Command	Response
Action Command: AT+CCWA=<n>, [<mode> [, <class>]]	[+CCWA: <status>,<class>[…]] OK
Read Command: AT+CCWA?	+CCWA: <n> OK
Test Command: AT+CCWA=?	+CCWA: (list of supported <n>s) OK

Unsolicited Result: +CCWA: <number>, <type>[,[<class>] [,<alpha>]

Values:

<n> **Result Code Presentation Status in the Terminal Adapter**
- **0** Disable
- **1** Enable

<mode>
- **0** Disable
- **1** Enable
- **2** Query

<number> **Phone Number**
String type

<type> **TON/NPI Type of Address Octet for <number>** (Integer type)
- **129** ISDN / telephony numbering plan, national / international unknown
- **145** ISDN / telephony numbering plan, international number
- **161** ISDN / telephony numbering plan, national number
- **128-255** Other values (refer GSM 04.08 section 10.5.4.7)

<class> **Class Call**
The combination of different classes is **not supported**. It will only result in the activation / deactivation / status request for all classes.
- **1** Voice
- **2** Data
- **7** Voice, data **(this is the default if value is omitted)**
- **8** Short Messages

<status> **Call Waiting Status**
- **0** Not Active
- **1** Active

<alpha> **Phonebook Name Associated with <number>**
String type

Parameter Storage: The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CCWA=?	+CCWA: (0,1) OK
AT+CCWA=1,1,1 Note: Enable call waiting for voice calls	OK
AT+CCWA=1,2 Note: Interrogate call waiting	+CCWA:1,1 OK Note: Call waiting active for voice calls +CCWA:”0146290800”,145,1,”FREDDY” Note: Number and name of the waiting voice call +CCWA:”0146290800”,145,1,”8023459678FFFF” (UCS2 format)
AT+CCWA=1,0,7 Note: Erase call waiting	OK

+CFUN Set Phone Functionality

Description:

This command selects the functionality level for the mobile station.

When the application wants to stop the product with a power off, or if the application wants to force the product to execute an IMSI DETACH procedure, then it must send:

AT+CFUN=0 (equivalent to +CPOF).

This command executes an IMSI DETACH and makes a backup copy of some internal parameters in SIM and in EEPROM. The SIM card cannot be accessed.

If the mobile equipment is not powered off by the application after this command has been sent, a re-start command (AT+CFUN=1 or AT+CFUN=1,1) will have to be issued to restart the GSM registration process.

If the mobile equipment is turned off after this command, then a power-on will restart the GSM registration process.

The AT+CFUN=1 (or AT+CFUN=1,1) command restarts the entire GSM stack and GSM functionality: a complete software reset is performed. All parameters are reset to their previous values if AT&W was not used.

The AT+CFUN=1,0 command set the MT full functionality without reset. If the command can be used after a AT+CFUN=0, AT+CPOF or AT+CFUN=4, else a +CME ERROR: 3 is returned. The RF and SIM are accessible.

The AT+CFUN=4 command stops the RF (performs an IMSI DETACH if the modem is registered) and keeps access to the SIM. All AT commands related to SIM access are allowed.

After performing a Power-OFF using +CPOF or AT+CFUN=0 command, the AT+CFUN=4 command returns +CME ERROR: 3.

If entries are written in the phonebook (+CPBW) and if the product is reset directly before +CPBW response (AT+CFUN=1 or AT+CFUN=1,1, with no previous AT+CFUN=0 command), some entries may be lost (the SIM task does not have enough time to write entries in the SIM card).

In addition, the OK response will be sent at the last saved (AT&W) baud rate defined by the +IPR command. With the autobauding mode, the response can be sent at a different baud rate. It is, therefore, preferable to save the defined baud rate with AT&W before sending the AT+CFUN=1 (or AT+CFUN=1,1) command.

Normally, when using UART1 or UART2 to manage the modem, the OK response is sent to the application after the wireless modem reset.

Caution:
When using the emulated serial port, the OK response is not provided. In addition, the modem reset will cause the USB stack to stop. From the host's point of view, it is similar to a USB cable disconnection. As a consequence, the host will uninstall the Wavecom USB driver and the application will reference a non valid driver.

Syntax:

Command	Responses
Action Command: AT+CFUN=<fun> [,<rst>]	OK
Read Command: AT+CFUN?	+CFUN: <fun> OK
Test Command: AT+CFUN=?	+CFUN: (list of supported <fun>s), (list of supported <rst>s)

Values:

<fun> **Functionality Level**

0 Set minimum funtionality; IMSI detach procedure and SIM stop

1 Set the full functionality mode with a complete software reset

<rst> **Reset (only for <fun>=1)**

0 Do not reset the modem before setting it to full functionality power level

1 Reset the modem before setting it to full functionality power level. Default

Parameter Storage: None

Examples:

Command	Responses
AT+CFUN=?	+CFUN: (0,1) , (0,1) OK
AT+CFUN? Note: Ask for current functionality level	+CFUN: 1 OK Note: Full functionality
AT+CFUN=0 Note: Set minimum functionality, IMSI detach procedure	OK
AT+CFUN=1,0 Note: Set the full functionality mode with a complete software reset	OK
AT+CFUN=1,0	+CME ERROR: 3 Note: No Power Off done before (CFUN=0, CFUN=4 or CPOF)
AT+CFUN=1 Note: Set the full functionality mode with a complete software reset	OK

+CGACT PDP Context Activate or Deactivate

Description: This command activates or deactivates the specified PDP context(s). After the command is completed, the modem remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged.

Syntax:

Command	Responses
Action Command: AT+CGACT=<state>[,<cid>[,<cid>[,…]]]	OK
Read Command: AT+CGACT?	+CGACT: <cid>,<state> [+CGACT: <cid>,<state>[…]] OK
Test Command: AT+CGACT=?	+CGACT: (list of supported <state>s) OK

Values:

<state> **State of PDP Context Activation**
- **0** Deactivated
- **1** Activated

<cid> **PDP Context Identifier**
Range: 1-4
Integer type

Parameter Storage: None

Examples:

Command	Responses
AT+CGDCONT=1,"IP","APN"	OK
AT+CGACT=1,1	OK
AT+CGACT?	+CGACT: 1,1 OK
AT+CGACT=?	+CGACT: (0-1) OK
AT+CGACT=0 Note: Deactivate all contexts	OK
AT+CGACT=1 Note: Activate first possible context	OK

+CGATT GPRS Attach or Detach

Description: This command is used to attach the modem to, or detach the modem from, the GPRS service. After the command has completed, the modem remains in V.25ter command state. If the modem is already in the requested state, the command is ignored and the OK response is returned.

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

Syntax:

Command	Responses
Action Command: AT+CGATT=<state>	OK
Read Command: AT+CGATT?	+CGATT: <state> OK
Test Command: AT+CGATT=?	+CGATT: (list of supported <state>s) OK

Values: **<state>** State of GPRS Attachment
- **0** Detached
- **1** Attached
- **2** Combined detach (GPRS and GSM detach in the same network request)

Parameter Storage: None.

Examples:

Command	Responses
AT+CGATT=1	OK
AT+CGATT?	+CGATT: 1 OK
AT+CGATT=?	+CGATT: (0-2) OK

+CGCLASS GPRS Mobile Station Class

Description: The set command is used to set the modem to operate according to the specified GPRS mobile class.

Syntax:

Command	Responses
Action Command: AT+CGCLASS=<class>	OK
Read Command: AT+CGCLASS?	+CGCLASS: <class> OK
Test Command: AT+CGCLASS=?	+CGCLASS: (list of supported <class>s)

Values: **<class>** **GPRS Mobile Class** (in descending order of functionality)
- **B** Class B
- **CG** Class C in GPRS only mode
- **CC** Class C in circuit switched only mode (lowest)

Parameter Storage: <class> is stored in EEPROM without using AT&W.

Examples:

Command	Responses
AT+CGCLASS=?	+CGCLASS: (“CG”,”CC”,"B") OK
AT+CGCLASS=”CC” Note: Enter GMS mode	OK
AT+CGCLASS?	+CGCLASS: (“CC”) OK

+CGDATA Enter Data State

Description: This command causes the modem to perform the necessary actions to set up communication between the DTE and the network. This may include performing a GPRS attach and one PDP context activation.

GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the **+CGATT** and **+CGACT** commands.

If the activation is successful, data transfer may proceed.

After data transfer and layer 2 protocol termination procedure completion, the V.25ter command state is re-entered and the modem returns the final result code OK.

Syntax:

Command	Responses
Action Command: AT+CGDATA [=<cid>]	CONNECT
Test Command: AT+CGDATA=?	+CGDATA: OK

No Read Command

Values: **<cid>** **PDP Context Identifier**
Range: 1-4
Integer type

Parameter Storage: None

Examples:

Command	Responses
AT+CGDATA=?	+CGDATA: "PPP" OK
AT+CGDATA=1	CONNECT

+CGDCONT Define PDP Context

Description: This command specifies PDP context parameter values for a PDP context identified by the local context identification parameter, <cid>. Four PDP contexts can be defined through the software.

Syntax:

Command	Responses
Action Command: AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]]	OK
Read Command: AT+CGDCONT?	+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>, <h_comp> [+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp> […]] OK
Test Command: AT+CGDCONT=?	+CGDCONT: (list of supported <cid>s),<PDP_type>,,, (list of supported <d_comp>s), (list of supported <h_comp>s) [+CGDCONT: (list of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[…]] OK

Values:

<cid> **PDP Context Identifier**
Range: 1-4
Integer type

<PDP_type> **Packet Data Protocol Type**
"IP" Internet Protocol
"PPP" Point to Point Protocol

<APN> **Access Point Name**: A logical name that is used to select the GGSN or the external packet data network.
String type
If the value is null or omitted, then the subscription value will be requested.

<PDP_addr> **PDP Address:** Identifies the modem in the address space applicable to the PDP.
If the value is null or omitted, then a value may be provided by the DTE during the PDP startup procedure or a dynamic address will be requested.
The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the **+CGPADDR** command. String type.

<d_comp> **PDP Data Compression Mode**
0 Off. **Default**
1 On

<h_comp> **PDP Header Compression**
0 Off. **Default**
1 On

Parameter Storage: The parameters are stored in EEPROM without using **AT&W**.

Examples:

Command	Responses
AT+CGDCONT=?	+CGCONT: (1-4), “IP”,,,(0-1),(0-1) +CGCONT: (1-4), “PPP”,,,0,0 OK
AT+CGDCONT: 1, “IP” “internet”	OK
AT+CGCONT?	+CGCONT: 1, “IP”,”internet”,,0,0 OK
AT+CGDCONT=1 Note: Delete <cid>=1	OK
AT+CGDCONT?	OK

+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable)

Description:

The **test command** returns values supported as a compound value.
The **read command** returns the current settings for each defined context for which a QOS was explicitly specified.
The **write command** allows the TE to specify a Quality of Service Profile for the context identified by the (local) context identification parameter <cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message. A special form of the write command, AT+CGEQMIN=<cid> causes the requested profile for context number <cid> to become undefined.

Syntax:

Test Command: AT+CGEQMIN=?
Test Response: +CGEQMIN: <PDP_type>, (list of supported <Traffic class>s), (list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s),

(list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s), (list of supported <Delivery order>s), (list of supported <Maximum SDU size>s), (list of supported <SDU error ratio>s), (list of supported <Residual bit error ratio>s), (list of supported <Delivery of erroneous SDUs>s), (list of supported <Transfer delay>s), (list of supported <Traffic handling priority>s)
OK

Read Command AT+CGEQMIN?
Read Response: +CGEQMIN: [<cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>]
[+CGEQMIN: <cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>]
[+CGEQMIN: ...]

Write Command: AT+CGEQMIN=<cid>[, <Traffic class>[, <Maximum bitrate UL>[, <Maximum bitrate DL>[, <Guaranteed bitrate UL>[, <Guaranteed bitrate DL>[, <Delivery order>[, <Maximum SDU
size>[, <SDU error ratio>[, <Residual bit error ratio>[, <Delivery of erroneous SDUs>[, <Transfer delay>[, <Traffic handling priority>]]]]]]]]]]]
Write Response: OK
ERROR
+CME ERROR <err>

Parameter Descriptions:

<cid>

Parameter specifies a particular PDP context definition. The parameter is used in other PDP context-related commands.

1...16

<Traffic class>

0 Conversational
1 Streaming
2 Interactive
3 Background
4 Default. Subscribed value.

<Maximum bitrate UL>

This parameter indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as 32 (e.g., AT+CGEQMIN=...,32,...).

0 Default. Subscribed value.

1...512

<Maximum bitrate DL>

This parameter indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as 32 (e.g., AT+CGEQMIN=...,32,...).

0 Default. subscribed value.

1...16000

<Guaranteed bitrate UL>

This parameter indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32
(e.g., AT+CGEQMIN=...,32,...).

0 Default. Subscribed value.

1...512

<Guaranteed bitrate DL>

This parameter indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32 (e.g., AT+CGEQMIN=...,32,...).

0 Default. Subscribed value

1...16000

<Delivery order>

This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

0 no

1 yes

2 Default. subscribed value.

<Maximum SDU size>

This parameter indicates the maximum allowed SDU size in octets.

0 Default. subscribed value.

10...1520 (value needs to be divisible by 10 without remainder)

<SDU error ratio>

This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as “mEe”. As an example a target SDU error ratio of $5*10^{-3}$ would be specified as “5E3” (e.g., AT+CGEQMIN=...,”5E3”,...).

“0E0“ Default. subscribed value.

“1E2“

“7E3“

“1E3“

“1E4“

“1E5“

“1E6“

“1E1“

<Residual bit error ratio>

This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error-detection is requested, residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as “mEe”. As an example, a target residual bit error ratio of 5*10-3 would be specified as “5E3” (e.g., AT+CGEQMIN=...,”5E3”,...).

“**0E0“** Default. subscribed value.

“5E2“

“1E2“

“5E3“

“4E3“

“1E3“

“1E4“

“1E5“

“1E6“

“6E8“

<Delivery of erroneous SDUs>

This parameter indicates whether SDUs detected as erroneous shall be delivered or not.

0 no

1 yes

2 no detect

3 Default. Subscribed value.

<Transfer delay>

This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.

0 Default. Subscribed value.
10...150 (value needs to be divisible by 10 without remainder)
200...950 (value needs to be divisible by 50 without remainder)
1000...4000 (value needs to be divisible by 100 without remainder)

<Traffic handling priority>
This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of the other bearers.
0 Default. subscribed
1
2
3

<PDP_type>
Packet Data Protocol Type
"IP" Internet Protocol (IETF STD 5)

Note: All QOS settings will be stored non volatile.

+CGEQREQ 3G Quality of Service Profile (Requested)

Description: The **test command** returns values supported as a compound value.

The **read command** returns the current settings for each defined context for which QOS was explicitly specified.

The **write command** allows the TE to specify a Quality of Service Profile for the context identified by the (local) context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network.

A special form of the write command, AT+CGEQREQ=<cid> causes the requested profile for context number <cid> to become undefined.

Syntax:
Test Command: AT+CGEQREQ=?
Test Response: +CGEQREQ : <PDP_type>, (list of supported <Traffic class>s), (list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s), (list of supported <Delivery order>s), (list of supported <Maximum SDU size>s), (list of supported <SDU error ratio>s), (list of supported <Residual bit error ratio>s), (list of supported <Delivery of erroneous SDUs>s), (list of supported <Transfer delay>s), (list of supported <Traffic handling priority>s)
OK

Read Command: AT+CGEQREQ?
Read Response: +CGEQREQ: [<cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>]
[+CGEQREQ: <cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>]
[+CGEQREQ: ...]

Write Command: AT+CGEQREQ=<cid>[, <Traffic class>[, <Maximum bitrate UL>[, <Maximum bitrate DL>[,
<Guaranteed bitrate UL>[, <Guaranteed bitrate DL>[, <Delivery order>[, <Maximum SDU
size>[, <SDU error ratio>[, <Residual bit error ratio>[, <Delivery of erroneous SDUs>[, <Transfer delay>[, <Traffic handling priority>]]]]]]]]]]]

Write Response: OK
ERROR
+CME ERROR: <err>

Parameter Descriptions:

<cid>

Parameter specifies a particular PDP context definition. The parameter is used in other PDP context-related commands.

1...16

<Traffic class>

0 Conversational
1 Streaming
2 Interactive
3 Background
4 Default. Subscribed value.

<Maximum bitrate UL>

This parameter indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as 32 (e.g. AT+CGEQREQ=...,32,...).

0 Default. subscribed value.
1...512

<Maximum bitrate DL>

This parameter indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as 32 (e.g. AT+CGEQREQ=...,32,...).

0 Default. subscribed value.
1…1600

<Guaranteed bitrate UL>

This parameter indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32 (e.g., AT+CGEQREQ=...,32,...).

0 Default. Subscribed value.
1...512

<Guaranteed bitrate DL>

This parameter indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32 (e.g., AT+CGEQREQ=...,32,...).

0 Default. subscribed value.
1...16000

<Delivery order>

This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

0 no
1 yes
2 Default. subscribed value.

<Maximum SDU size>

This parameter indicates the maximum allowed SDU size in octets.

0 Default. subscribed value.
10...1520 (value needs to be divisible by 10 without remainder)

<SDU error ratio>

This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as “mEe”. As an example a target SDU error ratio of $5*10^{-3}$ would be specified as “5E3” (e.g., AT+CGEQREQ=...,”5E3”,...).

“0E0“ Subscribed value. Default
“1E2“
“7E3“
“1E3“
“1E4“
“1E5“
“1E6“
“1E1“

<Residual bit error ratio>

This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error-detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as “mEe”. As an example a target residual bit error ratio of 5*10-3 would be specified as “5E3” (e.g., AT+CGEQREQ=...,”5E3”,...).

“0E0“ Subscribed value. Default
“5E2“
“1E2“
“5E3“
“4E3“
“1E3“
“1E4“
“1E5“
“1E6“
“6E8“

<Delivery of erroneous SDUs>

This parameter indicates whether SDUs detected as erroneous shall be delivered or not.

0 No
1 Yes
2 No detect
3 Subscribed value. Default

<Transfer delay>

This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.

0 Default. subscribed value.
10...150 (value needs to be divisible by 10 without remainder)
200...950 (value needs to be divisible by 50 without remainder)
1000...4000 (value needs to be divisible by 100 without remainder)

<Traffic handling priority>

This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of the other bearers.

0 Subscribed. Default
1
2
3

<PDP_type>

Packet Data Protocol Type
“IP“ Internet Protocol (IETF STD 5)

Note: All QOS settings will be stored non volatile.

+CGEREP GPRS Event Reporting

Description: This command enables or disables the sending of +CGEV unsolicited result codes from the modem to the DTE in the case of certain events occurring in the GPRS modem or the network.

Syntax:

Command	Responses
Action Command: AT+CGEREP=<mode> [,<bfr>]	OK
Read Command: AT+CGEREP?	+CGEREP: <mode>,<bfr> OK
Test Command: AT+CGEREP=?	CGEREP: (list of supported <mode>s), (list of supported <bfr>s) OK

Unsolicited Responses:

- If <event>=ME (MODEM) REJECT
  Unsolicited response: +CGEV: <event> <PDP_type>, <PDP_addr>
- If <event>= NW REACT or NW DEACT or ME (MODEM) DEACT
  Unsolicited response: +CGEV: <event> <PDP_type>, <PDP_addr>[,<cid>]
- If <event>=NW DETACH or ME (MODEM) DETACH
  Unsolicited response: +CGEV: <event>
- If <event>= NW CLASS or ME (MODEM) CLASS
  Unsolicited response: +CGEV: <event> <class>
- If <event>= NW CLASS or ME (MODEM) CLASS
  Unsolicited response: +CGEV: <event> <class>

Values:

<mode> **Buffer Unsolicited Result Mode**

0 Disable buffer unsolicited result codes. **Default**.

2 Enable buffer unsolicited result codes.

<bfr> **Handling Method for Buffered Result Codes**

0 Modem buffer of unsolicited result codes defined within this command is cleared when <mode> = 2 is entered.

<event> **GPRS Event**

ME (MODEM) REJECT
A network request for PDP context activation occurred when the modem was unable to report it to the DTE with a +CRING unsolicited result code and was automatically rejected.

NW REACT
The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the modem.

NW DEACT
The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the modem.

ME (MOBILE EQUIPMENT) DEACT
The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the modem.

NW DETACH
The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.

ME (MOBILE EQUIPMENT) DETACH
The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.

NW CLASS
The network has forced a change of MS (MOBILE STATION) class. The highest available class is reported.

ME (MOBILE EQUIPMENT) CLASS
The mobile equipment has forced a change of MS (MOBILE STATION) class. The highest available class is reported.

<PDP_type> Type of Packet Data Protocol
"IP" Internet Protocol (IETF STD 5)
"PPP" Point to Point Protocol (IETF STD 51)

<PDP_addr> PDP Address
Identifies the modem in the address space applicable to the PDP
String type

<cid> PDP Context Identifier
range: 1-4
integer type

Parameter Storage: The <mode> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CGEREP=?	+CGEREP: (0,2),(0) OK
AT+CGEREP=2	OK
AT+CGEREP?	+CGEREP: 2,0 OK
	+CGEREP: ME DETACH "IP", "10.15.139.22",1 Note: PDP context deactivation

+CGMI Manufacturer Identification

Description: Displays the manufacturer identification. This command is the same as +GMI.

Syntax:

Command	Response
AT+CGMI	xxxx MODEM OK

Values: None

Examples:

Command	Responses
AT+CGMI Note: Get manufacturer identification	xxxx MODEM OK Note: Command valid, xxxx modem

+CGMM Request Model Identification

Description: Returns the product model identification. This command is identical to AT+GMM.

Syntax:

Command	Responses
AT+CGMM	MC8790C OK

+CGMR Request Revision Identification

Description: Displays the revised software version. This command is the same as +GMR.

Syntax:

Command	Responses
AT+CGMR	<SW release>.<modem> <size> <date> <time> OK

Values:

<SW release> software release
<modem> type of Wireless modem
<size> software size
<date> date (mmddyy) of software generation
<time> hour (hh:mm) of software generation

Examples:

Command	Responses
AT+CGMR Note: Get software version	R70_00gg.WMP100 2009124 012408 21:14 OK Note : Software release v7.0, generated on January 24, 2008.

+CGPADDR Show PDP Address

Description: This command returns a list of PDP addresses for the specified context identifiers.

Syntax:

Command	Responses
Action Command: AT+CGPADDR[=<cid>[,<cid>[,…]]]	+CGPADDR: <cid>,<PDP_addr> [+CGPADDR: <cid>,<PDP_addr>[…]] OK
Test Command: AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s) OK

No Read Command

Values:

<PDP_address> **PDP Address**
Identifies the modem in the address space applicable to the PDP.
String type
The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined.
For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>.
<PDP_address> is omitted if none is available.

<cid> **PDP Context Identifier**
Range: 1-4
Integer type
If no <cid> is specified, the addresses for all defined contexts are returned.

Parameter Storage: None

Examples:

Command	Responses
AT+CGPADDR=?	+CGPADDR: (1,2,4) OK
AT+CGPADDR=2	+CGPADDR=2, "10.3.73.151" OK
AT+CGPADDR	+CGPADDR: 1, +CGPADDR: 2, "10.3.73.151" +CGPADDR: 4, OK Note: Context 2 is active

+CGREG GPRS Network Registration Status

Description: This command controls the presentation of an unsolicited result code +CGREG when there is a change in the modem's GPRS network registration status or when there is a change of the network cell.

Syntax:

Command	Responses
Action Command: AT+CGREG=<n>	OK
Read Command: AT+CGREG?	+CGREG: <n>,<stat> [,<lac>,<ci>] OK
Test Command: AT+CCGREG=?	+CGREG: (list of supported <n>s OK

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

Values:

<n> Unsolicited Result Code Activation Mode

0 Disable network registration unsolicited result code. Default.

1 Enable network registration unsolicited result code +CGREG: <stat>

2 Enable network registration and location information unsolicited result code +CGREG: <stat>,<lac>,<ci>]

<stat> Network Registration State

0 Not registered; the modem is not currently searching a new operator to which to register

1 Registered, home network

2 Not registered, but modem is currently searching a new operator to which to register

3 Registration denied

4 Unknown

5 Registered, roaming

<lac> Location Area Code

Two byte in hexadecimal format

String type

<ci> Cell ID

Two byte in hexadecimal format

String type

Parameter Storage: The <n> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CGREG=?	+CGREG: (0-2) OK
AT+CGREG=2	OK +CGREG: 1, "7500", "877F"
AT+CGREG?	+CGREG: 1, "7500", "877F" OK

+CGSMS Select Service for Mobile Originated SMS Messages

Description: This command specifies the service or service preference that the modem will use to send MO SMS messages.

Syntax:

Command	Responses
Action Command: AT+CGSMS=<service>	OK
Read Command: AT+CGSMS?	+CGSMS: <service> OK
Test Command: AT+CGSMS=?	CGSMS: (list of supported <services>s) OK

Values:

<service>	Service or Service Preference to Be Used
0	GPRS
1	Circuit switched. Default.
2	GPRS preferred (use circuit switched if GPRS is not available)
3	Circuit switched preferred (use GPRS if circuit switched not available)

Parameter Storage: The parameters are stored in EEPROM without using AT&W.

Examples:

Command	Responses
AT+CGSMS=?	+CGSMS: (0-3) OK
AT+CGSMS=0	OK
AT+CGSMS?	+CGSMS: 0 OK

+CHLD Call Related Supplementary Services

Description: This command manages call hold and multiparty conversations (conference calls). Calls can be put on hold, recovered, released or added to a conversation.

Call hold and multiparty are only applicable to teleservice 11 (speech telephony)

Syntax:

Command	Response
Action Command: AT+CHLD=< n >	OK
Read Command: AT+CHLD?	OK
Test Command: AT+CHLD=?	+CHLD: (list of supported <n>s) OK

Values: **<n> Call-Related Services**

- **0** Release all held calls or set User Determined User Busy (UDUB) for a waiting call
- **1** Release all active calls (if any exist) and accept the other (held or waiting) call
- **1x** Release a specific call X (active, held or waiting)
- **2** Place all active calls (if any exist) on hold and accept the other (held or waiting) call
- **2x** Place all active calls on hold except call X with which communication is supported
- **3** Add a held call to the conversation
- **4** Connects the two calls and disconnect the subscriber from both calls (Explicit Call Transfer)

Parameter Storage: None

Examples:

Command	Responses
AT+CHLD=?	+CHLD: (0-4, 11-17, 21-27) OK
ATD0123456789;	OK
+WIND: 5,1	
AT+CLCC	+CLCC: 1,0,0,0,0,"0123456789",129 OK
+WIND: 5,2 Note: incoming call in waiting state	
AT+CLCC Note: Com id 1 is active, com id 2 is in waiting state	+CLCC: 1,0,0,0,0,"0123456789",129 +CLCC: 2,1,5,0,0 OK
AT+CHLD=2	OK
AT+CLCC	+CLCC: 1,0,1,0,0,"0123456789",129 +CLCC: 2,1,0,0,0 OK Note: Com id 1 is held, com id 2 is active

+CHUP Hang Up Call

Description: Cancels all active, waiting, and held calls. (Not applicable at this time)

Syntax:
Test Command: AT+CHUP=?
Test Response: OK
ERROR
+CME ERROR <err>

Exec. Command: AT+CHUP
Exec. Response: OK
ERROR
+CME ERROR <err>

Note: AT+CHUP supports only voice calls. Data connections can be disconnected with ATH only.

+CIMI Request IMSI

Description: This command reads and identifies the IMSI (International Mobile Subscriber Identity) of the SIM card.

Syntax:

Command	Response
Action Command: AT+CIMI	<IMSI> OK

No Read and Test Commands

Values: **<IMSI>** **IMSI of SIM Card**
15 digit number

Parameter Storage: None

Examples:

Command	Responses
AT+CIMI Note: Read the IMSI	208200120320598 OK Note: IMSI value (15 digits), starting with MCC (3 digits) / MNC (2 digits, 3 for PCS 1900)

+CIND Indicator Control

Description: This command is used to read or set the values of the mobile equipment (ME) indicators. If the ME does not allow setting of indicators or currently cannot be reached, a "+CMEE ERROR: <err>" is returned.

Syntax:

Command	Responses
Action Command: None	
Read Command: AT+CIND?	+CIND: <ind>,<ind>,<ind>,<ind>,<ind>,<ind>,<ind> OK
Test Command: AT+CIND=?	+CIND: <descr>,<list of supported <ind>s)) [, (<descr>, (list of supported <ind>s)) [, …] OK

Values:

<ind> **The Mobile Equipment Indicator State for One <descr> Parameter.**
Integer type value, which shall be in the range corresponding to the <descr> parameter.

- **0** Indicator is OFF or in a state that can be identified as "OFF" state
- **1** Indicator is ON or in a state that is more substantial than "OFF" state
- **2-5** 2 is more substantial than 1, and so on

<descr> **Mobile Equipment Indicator Description**

- **signal** Signal quality (0-5)
- **service** Service availability (0-1)
- **message** Message received (0-1)
- **call** Call in progress (0-1)
- **roam** Roaming indicator (0-1)
- **smsfull** SMS memory storage status in the modem (0-2)
  - **0** Memory locations are available
  - **1** Memory is full
  - **2** One SMS has been received, but the SMS storage where this SMS is to be stored is full.

Parameter Storage: None

Examples:

Command	Responses
AT+CIND?	+CIND: 2,1,1,0,0,0 OK Note: signal: 2, service: 1 – ME registered on the network, message:1 – an SMS has been received, call: 0 – no call is in progress, roam: 0 – not roaming, smsfull:0 SIM – card is not full of SMS
AT+CIND=? Note: Read possible value for ME indicators	+CIND: ("signal", (0-5)), ("service", 0-1)), ("message", 0-1)), ("call", 0-1)), ("roam", 0-1)), ("smsfull", 0-2)), OK

+CLCK Facility Lock

Description: This command is used by the application to lock, unlock or ask for a Mobile Equipment (ME) or network facility.

Syntax:

Command	Responses
Action Command: AT+CLCK= <fac>,<mode> [,<passwd>[,<class>]]	[+CLCK: <status> <class1>[….]] OK
Read Command: AT+CLCK?	+CLCK: (<fac>,<status>),[….]
Test Command: AT+CLCK=?	+CLCK: list of supported (<fac>s) OK

Values:

<fac> **Facility**
- **PS** SIM lock facility with an 8-digit password.
- **SC** PIN enabled (<mode> = 1) / disabled (<mode> = 0)
- **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 When Roaming outside Home Country)
- **AB** All Barring services
- **AG** All out Going barring services
- **AC** All in Coming barring services
- **FD** SIM Fixed Dialing Numbers (FDN) memory feature (PIN2/CHV2 is required as <password>)
- **PN** Network lock with an 8 digit password (NCK)
- **PU** Network subset lock with an 8 digit password (NSCK)
- **PP** Service Provider lock with an 8 digit password (SPCK)
- **PC** Corporate lock with an 8 digit password (CCK)

<mode> **Requested Operation**
- **0** Unlock the facility
- **1** Lock the facility
- **0** Query status

<password> **Password Code**
String type. 4 to 8 or 16 digits depending on <fac>

<class> **Call Class.** The combination of different classes is not supported. It will only result in the activation/deactivation/status request of all classes (7).
- **1** Voice (telephony)
- **2** Data
- **7** Voice and data. Default value if omitted.
- **8** Short Messages

<status> **Facility Lock Status**
- **0** Not Active
- **1** Active

Parameter Storage: The <mode> and <password> parameters are stored in EEPROM and SIM (depending on <fac>) without using the AT&W command.

Examples:

Command	Responses
AT+CLCK=?	+CLCK: (“PS”,”SC”,”AO”,”OI”,”OX”,”AI”,”IR”,”AB”, "AG",”AC”, ”FD”,"PN","PU","PP",”PC”) OK
AT+CLCK=”SC”,1,1234 Note: Activate PIN locking, 1234 is PIN1/CHV1	OK
AT+CLCK=”SC”,2	+CLCK: 1 OK
AT+CLCK?	+CLCK:(“PS”,0),(“SC”,1),(“FD”,0),(“PN“,0), (“PU“,0),(“PP“,0),(“PC“,0) OK

+CLIP Calling Line Identification Presentation

Description: This command controls the Calling Line Identification Presentation supplementary service. When presentation of the CLI (Calling Line Identification) is enabled (and the calling subscriber allows the function), +CLIP unsolicited response is returned after every RING (or +CRING) result code.

Syntax:

Command	Response
Action Command: AT+CLIP=< n >	OK
Read Command: AT+CLIP?	+CLIP: <n>,<m> OK
Test Command: AT+CLIP=?	+CLIP: (list of supported <n>s) OK

Unsolicited Response: +CLIP: <number>, <type>[,<subaddr>,<satype>[, [<alpha>] [,<CLI validity>]]]

Values:

<n> **CLIP Mode in the Terminal Adapter**
- **0** Disable. **Default**
- **1** Enable

<m> **Subscriber CLIP Service Status in the Network**
- **0** CLIP not provisioned
- **1** CLIP provisioned
- **2** Unknown (no network…)

<number> **Phone Number**
String type

<type> **TON/NPI Type of Address Octet for <number>** (Integer type)
- **129** ISDN / telephony numbering plan, national / international unknown. <number> does not include the international access code character "+".
- **145** ISDN / telephony numbering plan, international number <number> includes the international access code character "+".
- **161** ISDN / telephony numbering plan, national number
- **128-255** Other values (refer GSM 04.08 section 10.5.4.7)

<subaddr> **Subaddress**
String type

<satype> **TON/NPI Type of Address Octet for <subaddr>**
- **129** ISDN / telephony numbering plan, national / international unknown. <subaddr> does not include the international access code character "+".
- **145** ISDN / telephony numbering plan, international number <subaddr> includes the international access code character "+".
- **161** ISDN / telephony numbering plan, national number
- **128-255** Other values (refer GSM 04.08 section 10.5.4.7)

<alpha> **Phonebook Name Associated with <number>**
String type

<CLI validity> **CLI Validity**
- **0** CLI valid
- **1** CLI has been withheld by the originator
- **2** CLI is **not** available due to interworking problems or limitation of originating network

Parameter Storage: The <n> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CLIP=1 Note: Enable CLIP	OK
AT+CLIP? Note: Ask for current functionality	+CLIP:1,1 OK Note: CLIP is enabled and provisioned
	RING Note: Incoming call +CLIP: “0146290800”,129,1,,”FRED” Note: Incoming call with number and name presentation
	RING Note: Incoming call +CLIP: “0146290800”,129,1,, “8000204212FFFF” Note: Incoming call with number/name presentation (UCS2 format)
	RING Note: Incoming call +CLIP: “0146290800”,161 Note: Incoming call not found in any phonebook
AT+CLIP=?	+CLIP: (0-1) OK

+CLIR Calling Line Identification Restriction

Description: This command controls the Calling Line Identification restriction supplementary service.

Syntax:

Command	Response
Action Command: AT+CLIR=<n>	OK
Read Command: AT+CLIR?	+CLIR: <n>,<m> OK
Test Command: AT+CLIR=?	+CLIR: (list of supported <n>s) OK

Values: **<n> CLIR Mode for Outgoing Calls**

- **0** Presentation indicator is used according to the subscription of the CLIR service. **Default**
- **1** CLIR invocation
- **2** CLIR suppression

<m> Subscriber CLIR Status in the Network

- **0** CLIR not provisioned
- **1** CLIR provisioned in permanent mode
- **2** Unknown (no network…)
- **3** CLIR temporary mode presentation restricted
- **4** CLIR temporary mode presentation allowed

Parameter Storage: The <n> parameter is stored in EEPROM without using the AT&W command.

Examples:

Command	Responses
AT+CLIR=2	OK
AT+CLIR ? Note: Ask for current functionality	+CLIR: 2,4 OK
AT+CLIR=?	+CLIR: (0-2) OK

+CLVL Loudspeaker Volume Level

Description: This command is used by the application to tune the loudspeaker volume level.

Syntax:

Command	Response
Action Command: AT+CLVL=<volume>]	OK
Read Command: AT+SIDET?	+CLVL: <volume> OK
Test Command: AT+CLVL=?	+CLVL: (list of supported <volume>s) OK

Values: **<volume> Side Tone Mode Reception Volume**

There are two configuration modes:

- The gain is entered in deci dB units,
- The gain is entered in index.

By default gains are expressed in deci dB value.

All values are possible between the minimum and maximum values of the table given in the Notes section. If a value does not correspond to a table value, the nearest is kept.

Parameter Storage: All parameters are stored in EEPROM using the AT&W command.

Examples:

Command	Response
AT+CLVL=? Note: Test command	+CLVL: (-4000-800) OK
AT+CLVL=-2100	OK
AT+CLVL?	+CLVL: -2000 OK
AT+CLVL=?	+CLVL: (0-15) OK
AT+CLVL=9	OK
AT+CLVL?	+CLVL: 9 OK

+CME ERROR: ‹error› ME Error Result Codes:

<error>	Meaning	Resulting from the following commands
3	Operation not allowed	All GSM 07.07 commands (+CME ERROR: 3)
4	Operation not supported	All GSM 07.07 commands (+CME ERROR: 4)
5	PH-SIM PIN required (SIM lock)	All GSM 07.07 commands (+CME ERROR: 5)
10	SIM not inserted	All GSM 07.07 commands (+CME ERROR: 10)
11	SIM PIN required	All GSM 07.07 commands (+CME ERROR: 11)
12	SIM PUK required	All GSM 07.07 commands (+CME ERROR: 12)
13	SIM failure	All GSM 07.07 commands (+CME ERROR: 13)
16	Incorrect password	+CACM, +CAMM, +CPUC, +CLCK, +CPWD, +CPIN, +CPIN2 (+CME ERROR: 16)
17	SIM PIN2 required	+CPBW (FDN), +CLCK (FDN),
18	SIM PUK2 required	+CACM, +CAMM, +CPUC, +CPBW (FDN), +CPIN, +CPIN2, +CLCK (FDN), +CPWD
20	Memory full	+CPBW, +WOLM, ATD
21	Invalid index	+CPBR, +CPBW, ATD>[mem]index, +WMGO, +WPGW, +WOLM
22	Not found	+CPBF, +CPBP, +CPBN, +CGSN, +WOPN, ATD>[mem]”name”
24	Text string too long	+CPBW, +CPIN, +CPIN2, +CLCK, +CPWD, +WPGW, +WCCS, +WDSS
26	Dial string too long	+CPBW, ATD, +CCFC
27	Invalid characters in dial string	+CPBW
30	No network service	+VTS, +COPS=?, +CLCK, +CCFC, +CCWA, +CUSD
32	Network not allowed – emergency calls only	+COPS
40	Network personal PIN required (Network lock)	All GSM 07.07 commands (+CME ERROR: 40)
42	Network personal PIN required (Network subset lock)	All GSM 07.07 commands (+CME ERROR: 42)
44	Network personal PIN required (Service Provider lock)	All GSM 07.07 commands (+CME ERROR: 44)
46	Network personal PIN required (Corporate lock)	All GSM 07.07 commands (+CME ERROR: 46)
103	Incorrect MS identity	+CGATT
106	ME is blacklisted by network	+CGATT
107	Mobile Station is not allowed to operate in GPRS	+CGATT
111	Mobile Station is not allowed to operate in the requested PLMN	+CGATT
112	Mobile Station is not allowed to make location updating in this area	+CGATT
113	Roaming not allowed in this area	+CGATT
132	Service option not supported (#32)	+CGACT +CGDATA ATD*99
133	Requested service option not subscribed (#33)	+CGACT +CGDATA ATD*99
134	Service option temporarily out of order (#34)	+CGACT +CGDATA ATD*99
148	Unspecified GPRS error	All GPRS commands
149	PDP authentication failure	+CGACT +CGDATA ATD*99
150	Invalid mobile class	+CGCLASS +CGATT

+CMEE Report Mobile Equipment Errors

Description: This command defines the method for returning error messages. The simple ERROR message can be replaced by the verbose method to include the results codes +CME ERROR: <err>. (See section "ME error result code: +CME ERROR" in the "Appendixes" of the present document for "+CME ERROR" result codes description. See section "Message service failure result code: +CMS ERROR" in the "Appendixes" of the present document for "+CMS ERROR" result codes).

Syntax:

Command	Responses
Action Command: AT+CMEE=<n>	OK
Read Command: AT+CMEE?	+CMEE: <n> OK
Test Command: AT+CMEE=?	+CMEE: (list of supported <n>s) OK

Values: **<n> Error Reporting Method**

0 Disable ME error reports; use only "ERROR. **Default**

1 Enable +CME ERROR: <err> or +CMS ERROR: <err>

Parameter Storage: The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CMEE=?	+CMEE: (0,1) OK
AT+CMEE=0 Note: Disable ME error reports; use only "ERROR"	OK
AT+CMEE=1 Note: Enable "+CME ERROR: <err>" or "+CMS ERROR: <err>"	OK
AT+CMEE?	+CMEE: 1 OK

+CMER Mobile Equipment Event Reporting

Description: This command enables or disables the sending of unsolicited result codes in the case of a key press.

Syntax:

Command	Responses
Action Command: AT+CMER=[<mode>] [,[<keyp>] [,[<disp>] [, [<ind>] [,[<bfr>]]]]]	OK
Read Command: AT+CMER?	+CMER=<mode>,<keyp>,<disp>,<ind>, <bfr> OK
Test Command: None	

Unsolicited Response: +CKEV: <key>, <press> (key press event report)

+CIEV: <indresp>, <value> (indicator event report)

Values:

<mode> Processing of Unsolicited Result Codes

2 Buffer unsolicited result codes in the Terminal Adapter when TA-DTE link is reserved and flush them to the DTE after reservation (after +++ was entered). Otherwise, forward them directly to the DTE. **Default**.

3 Forward unsolicited result codes to the DTE by using a specific in-band technique: while TA-DTE link is reserved (i.e., DTE is in online data mode by CSD or GPRS call), unsolicited result codes are replaced by a break (100ms) and stored in a buffer. The unsolicited result codes buffer is flushed to the DTE after reservation (after +++ was entered). Otherwise, (the DTE is not in online data mode) forward them directly to the DTE.

<keyp> Keypad Event Reporting Mode

0 Keypad event reporting. Default.

1 Keypad event reporting is routed using unsolicited code. Only the key pressings not caused by +CKPD are indicated.

2 Keypad event reporting is routed using unsolicited code. All key pressings are indicated.

<ind> Indicator of Event Reporting Mode

0 Disabled. Default.

1 Indicator event reporting using unsolicited result code. Only the indicator events not caused by +CIND shall be indicated by the Terminal Adapter to the DTE.

2 Indicator event reporting using unsolicited result code. All indicator events shall be directed from Terminal Adapter to DTE.

<key> Keyboard Map is (5,5)

0	1	2	3	4
5	6	7	8	9
10	11	12	13	14
15	16	17	18	19
20	21	22	23	24

<press> Key Operation

1 Key pressed

0 key released

<indresp> Indicator Order Number (as specified for +CIND)

<value> New Value of the Indicator

<bfr> Terminal Adapter (TA) Buffer of Unsolicited Result Codes Mode

0 Terminal Adapter (TA) buffer defined within this command is flushed to the DTE. **Default.**

<disp> Display Event Reporting Mode

0 Disabled. Default.

Parameter Storage: The <keyp> and <ind> parameters are stored in EEPROM using AT&W command. The default values can be restored using AT&F.

Examples:

Command	Responses
AT+CMER=1 Note: Ask for key press event report	OK
	+CKEV:12,1 +CKEV:12,0 Note: Key 12 has been pressed and released
AT+CMER=,,,1 Note: Asks for indicator event report	OK
	+CMTI: "SM" ,10 +CIEV: 7,1 Note: SMS Memory storage is full
AT+CMER?	+CMER: 2,1,0,1,0 OK

+CMUT Microphone Mute Control

Description: This command mutes the microphone input on the product (for the active microphone set with the +SPEAKER command). This command is allowed only during a call.

Syntax:

Command	Responses
Action Command: AT+CMUT=<mode>	OK
Read Command: AT+CMUT?	+CMUT: <mode> OK
Test Command: AT+CMUT =?	+CMUT: (list of supported <mode>s) OK

Values:

<mode> **Microphone Mute Mode**

0 Microphone mute off. **Default**

1 Microphone mute on.

Parameter Storage: None

Examples:

Command	Responses
AT+CMUT=?	+CMUT: (0,1) OK
AT+CMUT=1 Note: Mute ON (call active)	OK
AT+CMUT? Note: Ask for current value	+CMUT: 1 OK Note: Mute is active (call active)

+CNUM Subscriber Number

Description: This command returns the subscriber MSISDN(s). If the subscriber has different MSISDNs for various services, each MSISDN is returned in a separate line.

Syntax:

Command	Responses
Action Command: AT+CNUM	+CNUM :<alpha$_1$>,<number$_2$>, <type$_1$> [+CNUM :<alpha$_1$>,<number$_2$>, <type$_1$> […]] OK
Test Command: AT+ CNUM=?	OK

No Read Command

Values:

<alphax$_1$> Optional Alphanumeric String Associated with <number$_1$>

<number$_1$> Phone Number in ASCII Format

String type

<type$_1$> **TON/NPI** (Type of Address Octet in Integer Format)

Default is 145 when the dialing string includes international access code character "+"; otherwise it is **129**.

129 ISDN / telephony numbering plan, national / international unknown

145 ISDN / telephony numbering plan, international number

161 ISDN / telephony numbering plan, national number

128-255 Other values (refer GSM 04.08 section 10.5.4.7)

Parameter Storage: None

Examples:

Command	Responses
AT+CNUM Note: Get MSISDN(s)	+CNUM:”Phone”, “0612345678”,129 +CNUM: "Fax" “0687654321”, 129 +CNUM: “80001002FFFF”, “+0183773”, 145 OK Note: Last number is in UCS2 format
AT+CNUM=? AT+CPBS=”ON” AT+CPBW=4,”0146278478”,161,”Cell” AT+CNUM	OK OK OK +CNUM: "Phone","0612345678",129 +CNUM: "Fax","0687654321",129 +CNUM: "80001002FFFF","+0183773",145 +CNUM: "Cell","0146278478",161 OK

+COLP Connected Line Identification Presentation

Description: This command enables the Connected Line identification Presentation supplementary service. This can be useful for call forwarding of the connected line. When presentation of the connected line identification is enabled (and the calling subscriber allows the function), +COLP unsolicited response is returned in response of an ATD command.

Syntax:

Command	Response
Action Command: AT+COLP=<n>	OK
Read Command: AT+COLP?	+COLP: <n>,<m> OK
Test Command: AT+COLP=?	+COLP: (list of supported <n>s) OK

Unsolicited Response: +COLP: <number>,<type>[,<subaddr>,<satype>[,[<alpha>]]

Values:

<n> **Parameter Sets/Shows the Result Code Presentation Status in the Terminal Adapter**
- **0** Disable
- **1** Enable

<m> **Parameter Shows the Subscriber COLP Service Status in the Network**
- **0** COLP not provisioned
- **1** COLP provisioned
- **2** Unknown (no network)

<number> **Phone Number**
String type

<type> **TON/NPI Type of Address Octet for <number>** (Integer type)
- **129** ISDN / telephony numbering plan, national / international unknown. <number> does not include the international access code character "+".
- **145** ISDN / telephony numbering plan, international number <number> includes the international access code character "+".
- **161** ISDN / telephony numbering plan, national number
- **128-255** Other values (refer GSM 04.08 section 10.5.4.7)

<subaddr> **Subaddress**
String type

<satype> **TON/NPI Type of Address Octet for <subaddr>** (Integer type)
- **129** ISDN / telephony numbering plan, national / international unknown. <subaddr> does not include the international access code character "+".
- **145** ISDN / telephony numbering plan, international number <subaddr> includes the international access code character "+".
- **161** ISDN / telephony numbering plan, national number
- **128-255** Other values (refer GSM 04.08 section 10.5.4.7).

<alpha> **Phonebook Name Associated with <number>**
String type

Parameter Values: The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

See next page for Examples

Examples:

Command	Responses
AT+COLP=1 Note: Activate COLP	OK
AT+COLP? Note: Ask for current functionality	+COLP:1,1 OK Note: COLP is enabled and provisioned
ATD146290800; Note: Outgoing call	+COLP:"0146290800",129,,"JOE" or +COLP:"0146290800",129,1,,"8000204212FFFF" OK Note: "8000204212FFFF": UCS2 format Connected outgoing line number and name presentation
AT+COLP=?	+COLP: (0-1) OK

+COPN Read Operator Name

Description: This command returns the list of all store operator names (in numeric and alphanumeric format).

Syntax:

Command	Responses
Action Command: AT+COPN	+COPN: <NumOper>,<AlphaOper> [+COPN: <NumOper>,<AlphaOper> […]] OK
Test Command: AT+COPN=?	OK

No Read Command

Values: **<NumOper>** **Operator in Numeric Format**

<AlphaOper> **Operator in long alphanumeric format** (see Operator Names in the Appendix)

Parameter Storage: None

Examples:

Command	Responses
AT+COPN Note: Ask for list of all networks	+COPN: 20201 "GR COSMOTE" +COPN: 20205 "Vodafone GR" +COPN: 20209 "GR Q-TELECOM" +COPN: 20210 "TIM GR" … OK
AT+COPN=?	OK

+COPS Operator Selection

Description: There are three possible ways of selecting a Public Land Mobile Network (PLMN) operator:

- The product is in **manual** mode. It then tries to find the operator specified by the application and, if found, tries to register.
- The product is in **automatic** mode. It then tries to find the home operator and, if found, tries to register. If not found, the product automatically searches for another network.

- The product enters into **manual/automatic** mode, and then tries to find an operator as specified by the application (as in manual mode). If this attempt fails, it enters **automatic** mode. If this is successful, the operator specified by the application is selected. The mobile equipment then enters into **automatic** mode.

Note: The read command returns the current mode and currently selected operator. In manual mode, this PLMN may not be the one set by the application (as it is in search phase).

These commands are not allowed during communication.

Syntax:

Command	Responses
Action Command: AT+COPS=<mode> [,<format> [,<oper>]]	OK
Read Command: AT+COPS?	+COPS: <mode> [,<format>,<oper>] OK
Test Command: AT+COPS=?	+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>)s] OK

Values:

<mode> **Network Registration Mode**

0 Automatic. **Default**
1 Manual
2 Deregistration; ME (Mobile Equipment) will be unregistered until <mode>=0 or 1 is selected.
3 Set only <format> (for read command AT+COPS?)
4 Manual / automatic (<oper> shall be present). If manual selection fails, automatic mode is entered.

<format> **Format of <oper> Field**

0 Long alphanumeric format <oper>
1 Short alphanumeric format <oper>
2 Numeric <oper> **Default**

<stat> **Status of <oper> Field**

0 Unknown
1 Available
2 Current
3 Forbidden

<oper> **Operator Identifier (MCC/MNC in Numeric Format only for Operator Selection)**

The long alphanumeric format can be up to 16 characters long (for operator names description see "Operator Names" section in the Appendix in the field "Name"). The short alphanumeric format can be up to 10 characters long.

Parameter Storage: The <format> and <mode> parameters are stored in EEPROM using **AT&W**. The default value can be restored using **AT&F**.

Examples:

Command	Responses
AT+COPS? Note: Ask for current PLMN	+COPS: 0,2,20801 OK Note: Home PLMN is Orange
AT+COPS=? Note: Ask for PLMN list	+COPS: (2,”F SFR”,”SFR”,”20801”), (3,”F-BOUYGUES TELECOM”,”BYTEL”,”20820”),(3,”Orange F”,”Orange”, ”20801”) OK Note: Home PLMN is SFR. BYTEL and Orange networks have been detected
AT+COPS=1,2,20810 Note: Ask for registration on SFR network	+CME ERROR: 32 Note: Network not allowed – emergency calls only

AT+COPS=1,2,23433 Note: Ask for registration on UK Orange network	+CME ERROR: 529 Note: Selection failed – emergency calls only
AT+COPS=0 Note: Ask for registration in automatic mode	OK Note: Successful
AT+COPS=3,0 Note: Set <format> to long alphanumeric	OK Note: Successful
AT+COPS? Note: Ask for current PLMN	+COPS: 0,0,"Orange F" OK Note: Home PLMN is Orange
AT+COPS=2 Note: Ask for deregistration from network	OK Note: Successful
AT+COPS? Note: Ask for current PLMN	+COPS: 2 OK Note: Mobile equipment is unregistered until <mode>=0 or 1 is selected

+CPAS Phone Activity Status

Description: Returns the activity status of the mobile equipment.

Syntax:

Command	Responses
Action Command: AT+CPAS	+CPAS: <pas> OK
Read Command: None	
Test Command AT+CPAS=?	+CPAS: (list of supported <pas>s) OK

Values: **<pas> Phone Activity Status**

- **0** Ready (allow commands from TA/TE)
- **1** Unavailable (does not allow commands)
- **2** Unknown
- **3** Ringing (ringer is active)
- **4** Call in progress
- **5** Asleep (low functionality)

Parameter Storage: None

Examples:

Command	Responses
AT+CPAS Note: Current activity status	+CPAS: 0 OK
AT+ CPAS=?	+CPAS: (0-5) OK

+CPBF Find Phonebook Entries

Description: This command returns phonebook entries with alphanumeric fields starting with a given pattern. The AT+CPBF= "" command can be used to display all phonebook entries sorted in alphabetical order.

This command is not allowed for "LD", "RC", "MC" phonebooks and for the “EN” phonebook, which does not contain alphanumeric fields.

It is possible to use this command with UCS2 strings. If a wrong UCS2 format is entered, the string is considered as an ASCII string.

Syntax: Depending on the context, several responses to the command are possible:

The Entry is Stored in the ADN Phonebook and AT+WCOS=0

Command	Responses
Action Command: AT+CPBF=<string>	+CPBF: <loc>,<num>,<type>,<name> OK

The Entry is Stored in the ADN Phonebook and AT+WCOS=1

Action Command: AT+CPBF=<string>	+CPBF: <loc>,<num>,<type>,<name>,<phb_group> OK

The Entry is Stored in the Mobile Equipment Phonebook and AT+WCOS=0

Action Command: AT+CPBF=<string>	+CPBF: <loc>,<num>,<type>,<name>, OK

The Entry is Stored in the Mobile Equipment Phonebook and AT+WCOS=1

Action Command: AT+CPBF=<string>	+CPBF: <loc>,<num>,<type>,<name>,<contact>,<phb_group> OK

Command	Responses
Test Command: AT+CPBF=?	+CPBF: <nlength>,<tlength>,<glength>,<slength>,<elength> OK

No Read Command

Values:

<string> **Searched Pattern String** (depends on the format of the data stored in the phonebooks)

<loc> **Location Number** (20 digits maximum)

<num> **Phone number** (20 digits maximum)

<type> **TON/NPI Type of Address Octet** (Integer type)
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<phb_group> **Phonebook Group**
Range (1-10)

<name> **Name Associated with the Phone Number**
Up to 30 ASCII characters or 13 UCS2

<contact> **This parameter gathers the following parameters:**
<num_Mobile>,<num_Work>, <num_Fax>, <num_Data>, <Email>, <Address>

<num_Mobile> **Phone Number** (dedicated for mobile phone number)
Up to 20 digits

<num_Work> **Phone Number** (dedicated for work phone number)
Up to 20 digits

<num_Fax> **Phone Number**
Up to 20 digits

<num_Data> **Phone Number** (dedicated for data phone number)
Up to 20 digits

<Email> **E-Mail Address**
String type
Up to 56 characters

<Address> **Mail Address**
String type
Up to 56 characters

Parameter Storage: None

Examples:

Command	Responses
AT+CPBF=? Note: Test command	+CPBF: 20,14 OK Note: Maximum length for a phone number is 20 digits; 14 characters for the text
AT+CPBF="E" Note: Read entries with "E"	+CPBF: 12,"112",129,"Emergency" +CPBF: 15,"+331290101",145,"Eric" OK Note: Display locations with text field starting with "E"
AT+CPBF="H" Note: Read entries with "H"	+CME ERROR: 22 Note: Entry not found
AT+CPBF="800001" Note: Read entries starting with 0001 UCS2 character	+CPBF: 11, "0146290921",129,"8000010002FFFF" OK Note: Display locations with text field starting with 0001 UCS2 character
AT+CPBF="8045C" Note: Read entries with "8045C" (ASCII format)	+CME ERROR: 22 Note: Entry not found. The string has a wrong UCS2 format; it is therefore considered as an ASCII string
AT+CPBS="SM" Note: ADN phonebook	OK
AT+WCOS=0 Note: Phonebook not extended	OK
AT+CPBF="Test" Note: Read entries with "Test"	+CPBF: 1,"0123456789",129,"Test ADN" Note: Display locations with text field starting with "Test"
AT+WCOS=1 Note: Phonebook extended	OK
AT+CPBF="Test" Note: Read entries with "Test"	+CPBF: 1,"0123456789",129,"Test ADN",0 Note: Display locations with text field starting with "Test", extended entry.
AT+CPBS="ME" Note: Flash phonebook	OK
AT+WCOS=0 Note: Phonebook not extended	OK
AT+CPBF="Test" Note: Read entries "Test"	+CPBF: 1,"0123456789",129,"Test ME" Note: Display locations with text field starting with "Test"
AT+WCOS=1 Note: Phonebook extended	OK
AT+CPBF="Test" Note: Read entries with "Test"	+CPBF: 1,"0123456789",129,"Test ME", "9876543210",129, "",128, "",128," ",128,"e_mail@mail_address.com", "post address",0 Note: Read entries with "Test" Note: Display locations with text field starting with "Test", extended entry
AT+WCOS=0	OK
AT+CPBW=1," ",,"No number"	OK
AT+CPBF="No number"	+CPBF: 1," ",128,"No number" OK

+CPBR Read Phonebook Entries

Description: This command returns phonebook entries for a range of locations from the current phonebook memory storage selected with +CPBS.

Syntax: Depending on the context, several action commands are possible:

The Entry is Stored in the ADN Phonebook and AT+WCOS=0

Command	Responses
Action Command: AT+CPBR=<first_entry> [,<last_entry>]	+CPBR: <loc>,<num>,<type>,<name> [+CPBR: <loc>,<num>,<type>,<name>[…]] OK

The Entry is Stored in the ADN Phonebook and AT+WCOS=1

Action Command: AT+CPBR=<first_entry> [,<last_entry>]	+CPBR: <loc>,<num>,<type>,<name>,<phb_group> [+CPBR: <loc>,<num>,<type>,<name>,<phb_group> […]] OK

The Entry is Stored in the Mobile Equipment Phonebook and AT+WCOS=0

Action Command: AT+CPBR=<first_entry> [,<last_entry>]	+CPBR: <loc>,<num>,<type>,<name>, [+CPBR: <loc>,<num>,<type>,<name> […]] OK

The Entry is Stored in the Mobile Equipment Phonebook and AT+WCOS=1

Action Command: AT+CPBR=<first_entry> [,<last_entry>]	+CPBR: <loc>,<num>,<type>,<name>,<contact>,<phb_group> [+CPBR: <loc>,<num>,<type>,<name>,<contact>, <phb_group> […]] OK

Command	Responses
Test Command: AT+CPBR=?	+CPBR: (list of supported <loc>s), <nlength>,<tlength> OK

No Read Command

Values:

<first_entry> **First Location** (or range of locations)
Where to read phonebook entry

<last_entry> **Last Location** (or range of locations)
Where to read phonebook entry

<type> **TON/NPI Type of Address Octet** (Integer type)
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<nlength> **Max Length of Field <number>**
Integer type

<tlength> **Max Length of Field <name>**
Integer type

<loc> **Phonebook Index**
Integer type

<phb_group> **Phonebook Group**
Range (1-10)

<num> **Phone Number**
String type

<name> **Name Associated with the Phone Number**
Up to 30 ASCII characters or 13 UCS2

<contact> **This parameter gathers the following parameters:**
<num_Mobile>,<num_Work>, <num_Fax>, <num_Data>, <Email>, <Address>

<num_Mobile> **Phone Number** (dedicated for mobile phone number)
Up to 20 digits

<num_Work> **Phone Number** (dedicated for work phone number)
Up to 20 digits

<num_Fax> **Phone Number** (dedicated for data phone number)
Up to 20 digits

<num_Data> **Phone Number** (dedicated for data phone number)
Up to 20 digits

<Email> **E-Mail Address**
String type
Up to 56 characters

<Address> **Mail Address**
String type
Up to 56 characters

Parameter Storage: None

Examples:

Command	Responses
AT+CPBR=? Note: Test command	+CPBR: (1-50),20,10 OK Note: 50 locations (from 1 to 50), max length for phone number is 20 digits, 10 characters max for name
AT+WCOS? Note: Test command	+WCOS: 0 OK Note: Contact not selected
AT+CPBR=12,14 Note: Read entries from 12 to 14	+CPBR: 12,”112”,129,”Emergency” +CPBR: 13,”+331290909”,145,”Fred” +CPBR: 14,”0146290808”,129,”Zazi” OK Note: Display locations 12,13,14 with location, number, type (TON/NPI), name
AT+CPBR=10 Note: Read entry 10	+CPBR:10,”0146290921”,129,”Rob” OK Note: Display location 10
AT+CPBR=11 Note: Read entry 11 (UCS2 format)	+CPBR:11,”0146290921”,129,”8000010002FFFF” OK Note: Display location 11
AT+CPBS="ME" Note: Flash memory	OK
AT+WCOS=1	OK Note: Contact selected
AT+CPBR=13 Note: Read entry	+CPBR: 13,”+331290909”,145,”Fred”, ”0141284549”, 129, “0600003210”, 129, ”0141280000”, 129, “019876543210”, 129, fred@mail_address.com, “Becker Street London”,1 OK Note: Display location 13 with location, number, type (TON/NPI), name and contact and phonebook group n1
AT+CPBS="SM" Note: ADN phonebook	OK
AT+CPBR=1	+CPBR:1,”0123456”,129,”test” OK
AT+WCOS=0	OK
AT+CPBW=1," ",,"No number"	OK
AT+CPBR=1	+CPBR: 1," ",128,"No number" OK

+CPBS Select Phonebook Memory Storage

Description: Selects phonebook memory storage. See Recommendation 3GPP 11.11 for more details.

Syntax:

Command	Responses
Action Command: AT+CPBS=<storage>[,<pin2>]	OK
Read Command: AT+CPBS?	+CPBS: <storage>,<used>,<total>
Test Command: AT+ CPBS=?	+CPBS: (list of supported <storage>s) OK

Values:

<storage>	**Phonebook Memory Storage**
SM	ADN Abbreviated Dialing Numbers (SIM phonebook)
FD	FDN Fixed Dialing Numbers (SIM restricted phonebook)
ON	MSISDN (SIM own numbers)
EN	ECC Emergency Call Codes (SIM or Mobile Equipment)
LD	LND Last Number Dial
MC	Mobile Equipment missed (unanswered received) calls list
ME	Mobile Equipment phonebook
MT	Combined Mobile Equipment and SIM phonebook (ME + SM)
RC	Mobile Equipment received calls list
SN	SDN Services Dialing Numbers (SIM special service numbers)
<pin2>	**Personal Identification Number 2**
<used>	**Used Locations in Selected Memory** Integer type
<total>	**Total Number of Locations in Selected Memory** Integer type

Parameter Storage: None

Examples:

Command	Responses
AT+CPBS=”SM” Note: Select ADN phonebook	OK Note: ADN phonebook is selected
AT+CPBS=? Note: Possible values	+CPBS: ("SM","LD","MC","ON","ME","RC","MT","SN","EN”) OK
AT+CPBS? Note: Get current phonebook memory storage	+CPBS:”SM”,10,20 OK Note: ADN phonebook selected, 10 locations used, 20 locations available

+CPBW Write Phonebook Entry

Description: This command writes a phonebook entry in an index location number of the current phonebook memory storage.

Syntax: Depending on the context, there are several possible action commands:

The Entry is Stored in the ADN Phonebook and AT+WCOS=0

Command	Responses
Action Command: AT+CPBW=[<index>] [,<number> [,<type> [,<text>]]]	OK

The Entry is Stored in the ADN Phonebook and AT+WCOS=1

Action Command: AT+CPBW=<index> [,<number> [,<type> [,<text> [,<phb_group>]]]]	OK

The Entry is Stored in the Mobile Equipment Phonebook and AT+WCOS=0

Action Command: AT+CPBW=<index> [,<number> [,<type> [,<text>]]]	OK

The Entry is Stored in the Mobile Equipment Phonebook and AT+WCOS=1

Action Command: AT+CPBW=<index> [,<number> [,<type> [,<text>[,<contact> [,<phb_group>]]]]]	OK

Command	Responses
Test Command: AT+CPBW=?	+CPBW: (list of supported <index>s), [<nlength>], (list of supported <type>s), [<tlength>]

No Read Command

Values:

<index> **Location in Memory Storage**
Range of possible values depending on the capacity of the phonebook memory
Integer type

<number> **Phone Number in ASCII Format**
String type

<type> **TON/NPI Type of Address Octet in Integer Format**
Default is 145 when the dialing string includes international access code character "+"; otherwise, it is **129.**
129 ISDN / telephony numbering plan, national / international unknown
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

<text> **Associated Contact Name**
String type (see note below)
SIM dependant for the ADN phonebook (use AT+CPBW=?)

<phb_group> **Phonebook Group Number** in Which the Entry Should Be Saved
Range value (1-10)

<nlength> **Max Length of Field <Number>**
Integer type

<tlength> **Max Length of Field <Text>**
Integer type

<contact> **This parameter gathers the following parameters:**
<num_Mobile>,<num_Work>, <num_Data>, <Email>, <Address>

<num_Mobile> **Phone Number** (dedicated for mobile phone number for example)
Up to 20 digits

<num_Work> **Phone Number** (dedicated for work phone number for example)
Up to 20 digits

<num_Fax> **Phone Number** (dedicated for data phone number for example)
Up to 20 digits

<num_Data> **Phone Number** (dedicated for data phone number for example)
Up to 20 digits

<Email> **E-Mail Address**
String type
Up to 56 characters

<Address> **Mail Address**
String type
Up to 56 characters

Parameter and Values Notes:

- For the <text> parameter all strings starting with "80" , "81" or "81" are considered in UCS2 format.
- The +CSCS (Select Character Set) command does not affect the format for phonebook entries.

Parameter Storage: None

Examples:

Command	Responses
AT+CPBS=”SM” Note: ADN phonebook	OK
AT+CPBS? Note: Get current memory storage	+CPBS: "SM”,1,10 OK Note: ADN phonebook is selected, 1 location is used and 10 locations are available.
AT+WCOS=0 Note: Phonebook not extended	OK
AT+CPBW=? Note: Test command	+CPBW: (1-50),20,(129,145),10 OK Note: 50 locations, phone number = 20 digits max, TON/NPI = 129 or 145, text length = 10 characters max
AT+CPBW=5,”112”,129,”SOS” Note: Write at location 5	OK Note: Location 5 written
AT+CPBR=5 Note: Read the entry at location 5	+CPBR: 5,”112”,129,”SOS” OK
AT+CPBS? Note: Get current memory storage	+CPBS:”SM”,2,10 OK Note: ADN phonebook is selected, 2 locations are used and 10 locations are available.
AT+CPBW=5,”01290917”,129,”Jacky” Note: Overwrite location 5	OK Note: Location 5 overwritten
AT+CPBW=6,”01292349”,129,”8000410042” Note: write location 6 (UCS2 format for the <text> field)	OK Note: Location 6 is written
AT+CPBW=8,”01292349”,129,”80xyz” Note: write location	OK Note: Location 8 is written. The string has a wrong UCS2 format. It is, therefore, considered as an ASCII string.
AT+CPBW=5,”01290917”,129,”Jacky”,1 Note: write an extended entry	+CME ERROR: 3 Note: Error because +WCOS: 0
AT+WCOS=1 Note: Phonebook extended	OK

AT+CPBW=5,”01290917”,129,”Jacky”1 Note: Write an extended entry	OK
AT+WCOS=0 Note: Phonebook not extended	OK
AT+CPBS=”ME” Note: Mobile Equipment Phonebook	OK
AT+CPBS? Note: How many entries are used	+CPBS: “ME”,2,500 Note: in Mobile Equipment phonebook, 2 locations are used and 500 locations are available.
AT+CPBW=1,”0123456798”,129,”first entry” Note: Write an entry not extended	OK
AT+CPBR=1 Note: Read the first entry	+CPBR: 1,”0123456798”,129,”first entry” OK
AT+WCOS=1 Note: Phonebook extended	OK
AT+CPBW=1,”0123456798”,129,”first entry” Note: Write an entry not extended	OK
AT+CPBW=2,”9876543210”,129,”second entry”,”6543210987”,129 Note: Write an extended entry	OK
AT+CPBR=1,2 Note: Read entry 1 and 2	+CPBR: 1,"0123456798",129,"first entry","",,"","","",,"","",0 +CPBR: 2,"9876543210",129,"second entry","6543210987",129,"",,"","",,"","",0 OK
AT+CPBW=13,”+331290909”,145,”Fred”, ”0141284549”,129,“0600003210”,129,”0141280000”, 129,“019876543210”,129, fred@mail_address.com, “Becker Street London”,1 Note: Write location with Contact and Phonebook Group n1	OK Note: Location 13 is written
AT+CPBW=,”+33145221100”,145,”SOS” Note: Write at the first location available	OK Note: First location available is written
AT+CPBS=”SM” Note: ADN phonebook	OK
AT+WCOS?	+WCOS: 1 OK Note: Extended phonebook
AT+CPBW=1 Note: Delete entry at first location	OK
AT+CPBW=1,”0123456,,”test”,1 Note: Add an extended entry in SIM with group number (1)	OK
AT+CPBR=1	+CPBR:1,”0123456,”129,”test” OK
AT+CPBW=1," ",,"No number" Note: Write an empty number. The TON/NPI is omitted	OK
AT+CPBW=2,”7654321”,161,”test2”,1	OK
AT+CPBR=2 +CPBR:2,"7654321",161,"test2",1	OK

+CPIN Enter PIN

Description: This command is used to enter the mobile equipment passwords (PIN1/CHV1, PIN2/CHV2, PUK1, PUK2, etc.) that are required before any mobile equipment functionality can be used. PIN1/CHV1 and PIN2/CHV2 are between **4** and **8** digits long; **PUK1** and **PUK2** are only **8** digits long.

After three unsuccessful attempts to enter the PIN, the PUK will be required. PUK validation forces the user to enter a new PIN code as a second parameter and this will be the new PIN code if PUK validation succeeds. PIN 1/CHV 1 is then enabled if PUK1 is correct.

The application is responsible for checking the PIN after each reset or power on if the PIN was enabled.

Syntax:

Command	Responses
Action Command: AT+CPIN=<pin>[,<NewPin>]	OK
Read Command: AT+CPIN?	+CPIN: <code> Note: No "OK"

No Test Command

Values:

<NewPin> **Personal Identification Number.**
This parameter is required if the PIN state is SIM PUK.
Four to eight digit numbers.

<pin> **Personal Identification Number.**
Normally PIN1/CHV/
According to AT+CPIN?, the <pin> parameter can be PUK 1, PH-SIM PIN, PH-NET PIN, PH-NETSUB PIN, PH-SERVPROV PIN, PH-CORPORATE PIN
Four to eight digit numbers.

<code> **SIM Code Status**

READY	Mobile equipment (ME) is not writing for any password
SIM PIN	PIN 1/CHV 1 is required
SIM PUK	PUK1 is required
SIM PIN2	PIN 2/CHV 2 is required
SIM PUK2	PUK2 is required
PH-SIM PIN	SIM lock (phone-to-SIM) is required
PH-NET PIN	Network personalization is required
PH-NETSUB PIN	Network subset is required
PH- SERVPROV PIN	Service provider is required
PH- CORPORATE PIN	Corporate is required

Parameter Storage: None

Examples:

Command	Responses
AT+CPIN=1234 Note: Enter PIN	OK Note: PIN code is correct
AT+CPIN=5678 Note: Enter PIN	+CME ERROR: 3 Note: Operation not allowed, PIN previously entered
AT+CPIN=00000000,1234 Note: Enter PUK and new PIN	+CME ERROR: 16 Note: Incorrect PUK
AT+CPIN=12345678,1234 Note: Enter PUK and new PIN, 2nd attempt	OK Note: PUK correct, new PIN stored

The response "+CME ERROR: 13" (SIM failure) is returned after 10 unsuccessful PUK attempts. The SIM card is then out of order and must be replaced.

If the user tries to do something which requires PIN 2/CHV 2, the product will refuse the action with a "+CME ERROR: 17" (SIM PIN2 required). The product then waits for SIM PIN 2/CHV 2 to be given.

If PIN 2/CHV 2 is blocked, SIM PUK2 is required instead of SIM PIN 2/CHV 2.

For example, the product needs PIN 2/CHV 2 to write in the fixed dialing phonebook (FDN) , so if SIM PIN 2/CHV 2 authentication has not been performed during the current session, SIM PIN 2/CHV 2 is required.

+CPOL Preferred Operator List

Description: This command is used to edit (or update) the SIM preferred list of networks. This list is read in the SIM file selected by the +CPLS command.

Syntax:

Command	Responses
Action Command: AT+CPOL= [<index>] [,<format>[,<oper> [,<GSM_AcT>,<GSMcomp_Act>,<Utran_Act>]]]	OK
Read Command: AT+CPOL?	+CPOL: <index>,<format>,<oper>[,<GSM_AcT>, <GSMcomp_Act>,<Utran_Act>] [+CPOL: <index>,<format>,<oper>[,<GSM_AcT>, <GSMcomp_Act>,<Utran_Act>] […]] OK
Test Command: AT+CPOL =?	+CPOL: (list of supported (<index>s), (list of supported <format>s) OK

Values:

<format> **PLMN List**
- **0** Long alphanumeric format for <oper>
- **1** Short alphanumeric format for <oper>
- **2** Numeric format for <oper>

<oper> **Operator Identifier**
Character string or integer (see <format>)

<GSM_AcT> **GSM Access Technology**

<GSMcomp_Act> **GSM Compact Access Technology**

<Utran_Act> **UTRA Access Technology**
- **0** Access technology not selected
- **1** Access technology selected

Parameter Storage: None

Examples:

Command	Responses
AT+CPOL? Note: Ask for preferred list of networks With only EF_PLMNsel present	+CPOL:1,2,26201 +CPOL: 6,2,20810 OK Note: Preferred list of networks in numeric format (read in EF_PLMNsel)

AT+CPOL? Note: Ask for preferred list of networks With EF_PLMNwAct selected and present	+CPOL:1,2,26201,1,0,0 +CPOL: 6,2,20810,1,0,0 OK Note: Preferred list of networks in numeric format (read in EF_PLMNwAct) GSM access technology selected GSM compact access technology not selected Utran access technology not selected
AT+CPOL=,0 Note: Select long alphanumeric format	OK
AT+CPOL? Note: Ask for preferred list of networks With only EF_PLMNsel present	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” OK Note: Preferred list of networks in long alphanumeric format
AT+CPOL=7,2,20801 Note: Add a network to the list	OK
AT+CPOL? Note: Ask for preferred list of networks With only EF_PLMNsel present	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” +CPOL: 7,0,”Orange F” OK Note: Preferred list of networks in long alphanumeric format
AT+CPOL=7 Note: Delete 7th location	OK
AT+CPOL? Note: Ask for preferred list of networks With only EF_PLMNsel present	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” OK Note: Preferred list of networks in long alphanumeric format
AT+CPOL=8,2,77777 Note: Add a new network to the list "i" with only EF_PLMNsel present	OK
AT+CPOL=8,2,77777,0,0,1 Note: Add a new network to the list With EF_PLMNwact present	OK Note: Access technology UTRAN is selected
AT+CPOL=8,2,77777 Note: Add a new network to the list With EF_PLMNwact present	OK Note: Default access technology GSM is selected
AT+CPOL? Note: Ask for preferred list of networks with only EF_PLMNsel present	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” +CPOL: 8,2,77777 OK Note: Preferred networks list in long alphanumeric format, but 8th entry is unknown so the product returns it in the numeric format
AT+CPOL=9,0,”Orange F” Note: Add new network to list (text format)	OK
AT+CPOL? Note: Ask for preferred list of networks With only EF_PLMNsel present	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” +CPOL: 8,2,77777 +CPOL: 9,0,”Orange F” OK Note: Preferred list of networks in long alphanumeric format
AT+CPOL=?	+CPOL: (1-16),(0-2) OK Note: The EF can accept 16 records. Supported formats are 0, 1, or 2.

+CPUC Price Per Unit and Currency Table

Description: This command sets the parameters for Advice of Charge related to price per unit and the currency table in the SIM file EF-PUCT.

PUCT information can be used to convert the home units (as used in +CAOC, +CACM and +CAMM) into currency units.

Syntax:

Command	Response
Action Command: AT+CPUC <currency>,<ppu>,<pin2 passwd>	OK
Read Command: AT+CPUC?	+CPUC: <currency>,<ppu> OK
Test Command: AT+CPUC=?	OK

Values:

<currency> **Currency Code**
String type

<ppu> **Price Per Unit**
String type

<pin2 passwd> **Personal Identification Number 2**
8 digit number

Parameters Storage: None

Examples:

Command	Responses
AT+CPUC=”EUR”,”0.82”,1234 Note: Set Currency and Price per unit update	OK Note: Euros at a rate of 0.82 per unit set
AT+CPUC?	+CPUC: ”EUR”,”0.82” OK

+CPWD Change Password

Description: This command is used by the application to change a password (PIN, call barring, NCK, etc.). The facility values (<fac>) are the same as for the +CLCK command with a “P2” facility to manage "SIM PIN2/CHV2".

For the network lock (“PN”), unlocking is forbidden after 10 failed attempts to disable (unlock) the network lock with an incorrect password.

Syntax:

Command	Responses
Action Command: AT+CPWD=<fac>,<oldpwd>,<newpwd>	OK
Test Command: AT+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>s) OK

No Read Command

Values:

<fac> **Facility P2 SIM P2:**

- **PS** SIM lock facility with an 8-digit password.
- **SC** Password change (user indicates old and new password)
- **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 When Roaming outside Home Country)
- **AB** All Barring services

AG	All out going barring services
AC	All in coming barring services
P2	PIN code 2/CHV2
FD	SIM Fixed Dialing Numbers (FDN) memory feature (PIN2 is required as <password>)
PN	Network lock with an 8 digit password (NCK)
PU	Network subset lock with an 8 digit password (NSCK)
PP	Service Provider lock with an 8 digit password (SPCK)
PC	Corporate lock with an 8 digit password (CCK)
<oldpwd>	4 or up to 8 or 16 digits according to the facility
<newpwd>	New password specified for the facility. String type [….]
<pwdlength>	Maximum length of the password for the facility. Range: 4-16

Parameter Storage: None

Examples:

Command	Responses
AT+CPWD=? Note: Possible values	+CPWD: (“PS”,8),(“SC”,8),(“AO”,4),(“OI”,4),(“OX”,4), (“AI”,4),(“IR,4),(“AB”,4),(“AG”,4),(“AC”,4), (“P2”,8),(“FD”,8),("PN",8),("PU",8),("PP",8), ("PC",8) OK Note: PIN1/CHV1, PIN2/CHV2 must be on 8 digit maximum (4 minimum). For call barring, 4 digits maximum.
AT+CPWD=”SC”,1234,5555 Note: Change PIN	OK Note: PIN was correct
AT+CPWD=”SC”,1234,5555 Note: Change PIN	+CME ERROR: 16 Note: PIN was wrong
AT+CPIN=5555 Note: Enter PIN	OK Note: PIN was correct
AT+CPWD=”PN”,12345678,00000000 Note: Change NCK	OK Note: NCK changed for network lock

+CR Service Reporting Control

Description: This command enables a more detailed type of service reporting in the case of incoming or outgoing data calls. Before sending the CONNECT response to the application, the product will specify the type of data connection that has been set up.

Syntax:

Command	Responses
Action Command: AT+CR=<mode>	OK
Read Command: AT+CR?	+CR: <mode> OK
Test Command: AT+CR=?	+CR: (list of supported <mode>s) OK

Unsolicited Response: +CR: <type>

Values:

<mode>	**Extended Reports Activation**
0	Disable extended reports. **Default**.
1	Enable extended reports
<type>	**Type of Call**
ASYNC	Asynchronous transparent
REL ASYNC	Asynchronous non-transparent
GPRS	GPRS

Parameter Storage: The <mode> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CR=?	+CR: (0,1) OK
AT+CR=1 Note: Extended reports enabled	OK Note: Command valid
AT+CR?	+CR: 1 OK
ATD0612345678 Note: CSD data call	+CR: ASYNC CONNECT 9600

+CRC Cellular Result Codes

Description: This command allows more detailed ring information for an incoming call (voice or data). Instead of the string "RING", an extended string is used to indicate which type of call is ringing.

Syntax:

Command	Responses
Action Command: AT+CRC=<mode>	OK
Read Command: AT+CRC?	+CRC: <mode> OK
Test Command: AT+CRC=?	+CRC: (list of supported <mode>s) OK

Unsolicited Response: +CRING: <type> [,<PDP_type> [,<PDP_addr>]]

Values:

<mode> **Extended Ring Information**
- **0** Disable extended reports. Default.
- **0** Enable extended reports

<type> **Detailed Ring Information**
- **ASYNC** Asynchronous transparent
- **REL ASYNC** Asynchronous non-transparent
- **VOICE** Voice
- **GPRS** GPRS network request for PDP context activation

<PDP_type> **Type of Packet Data Protocol**
- **"IP"** Internet Protocol
- **"PPP"** Point-to-Point Protocol

<PDP_addr> **PPP Address**
Identifies the Modem in the Address Space Applicable to the PDP
String type

Parameter Storage: The <mode> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CRC=?	+CRC: (0,1) OK
AT+CRC=1 Note: Extended reports enabled	OK Note: Command valid
AT+CRC?	+CRC: 1 OK
	+CRING: VOICE Note: Incoming voice call

+CREG Network Registration

Description: This command is used by the application to ascertain the registration status of the product.

Syntax:

Command	Responses
Action Command: AT+CREG=<mode>	OK

For <stat≠3>: Nominal Case

Read Command: AT+CREG?	+CREG: <mode>, <stat> [,<lac>,<ci>] OK

For <stat=3>: Specific Case

Read Command: AT+CREG?	+CREG: <mode>, <stat> [,<rejectCause>] OK

Test Command: AT+CREG=?	+CREG: (list of supported <mode>s) OK

Unsolicited Response for <stat≠3> Nominal Case: +CREG: <stat> [,<lac>,<ci>]
Unsolicited Response for <stat=3> Specific Case: +CREG: <stat> [,<rejectCause>]

Values:

<mode> Request Operation
- **0** Disable network registration unsolicited result code (**default**)
- **1** Enable network registration code result code +CREG: <stat>
- **2** Enable network registration and location information unsolicited result code +CREG: <stat>,<lac>,<ci> if there is a change of network cell.

<stat> Network Registration State
- **0** Not registered, Mobile Equipment is not currently searching for a new operator.
- **1** Registered, home network.
- **2** Not registered, Mobile Equipment currently searching for a new operator to register to.
- **3** Registration denied.
- **4** Unknown.
- **5** Registered, roaming.

<lac> Location Area Code
String type; two byte location area code in hexadecimal format (e.g., “00C3” equals 195 in decimal).

<ci> Cell ID
String type; two byte cell ID in hexadecimal format.

<rejectCause> Network Registration Denied Cause
- **0** Illegal Mobile Station
- **1** Illegal Mobile Equipment
- **2** IMSI unknown
- **3** Bad network authentication

Parameter Storage: The <mode> parameter is stored in EEPROM using the **AT&W** command. The default value can be restored using **AT&F**.

Examples:

Command	Responses
AT+CREG?	+CREG: <mode>,<stat> OK
AT+CREG=0 Note: Disable network registration unsolicited result code	OK Note: Command valid
AT+CREG=1 Note: Enable network registration	OK Note: Command valid
AT+CREG=2 Note: Enable network registration unsolicited result code registration	OK Note: Command valid

AT+CREG=?	+CREG: (0-2) Note: 0,1,2 <mode> values are supported
AT+CREG? Note: Get the CREG status	+CREG: 2,1,"006","7D9A" OK Note: The modem is registered on the home network with lac=0006 and cell ID = 7D9A
	+CREG: 3 Note: The network indicates that the registration is denied
AT+CREG? Note: Get the CREG status	+CREG: 2,1,"006","7D9A" OK Note: The modem is registered on the home network with lac=0006 and cell ID = 7D9A
	+CREG: 3,1 Note: The network indicates that the registration is denied for an illegal mobile equipment reason

+CRLP Radio Link Protocol Parameters

Description: This command modifies the radio link protocol parameters used for non transparent data transmission.

Syntax:

Command	Responses
Action Command: AT+CRLP=[<iws>] [,<mws>] [,[<T1>] [,<N2>] [,[<ver>]]]]]	OK
Read Command: AT+CRLP?	+CRLP: <iws>,<mws>,<T1>,<N2>,<ver> OK
Test Command: AT+CRLP=?	+CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s), (list of supported <ver>s) OK

Values:

<iws> **Down Window Size**
Range: 0-61 (default is 61)

<mws> **Up Window Size**
Range: 0-61 (default is 61)

<T1> **Acknowledgement timer in units of 10ms**
Range: 40-255 (default is 48)

<N2> **Retransmission attempts**
Range: 1-255 (default is 6)

<ver> **RLP version number**
0 V42bis is not supported
1 V42bis is supported

Parameter Storage: Parameters are stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CRLP=?	+CRLP: (0-61),(0-61),(40-255),(1,255),(0,1) OK
AT+CRLP=61,61,48,6,0 Note: Set new parameters	OK
AT+CRLP? Note: Current values	AT+CRLP: 61,61,48,6,0

+CRSM Restricted SIM Access

Description: AT+CRSM offers easy access of the Elementary Files on the SIM. Access to the SIM database is restricted to the commands which are listed at <command>. However, additional SIM commands are available via AT^SXSM.

All parameters of AT+CRSM are used as specified by GSM 11.11. The Multi-Tech wireless modem handles internally all required SIM interface locking and file selection routines.

As response to the command, the Multi-Tech wireless modem sends the actual SIM information parameters and response data. Error result code "+CME ERROR" may be returned if the command cannot be passed to the SIM; e.g., if the SIM is not inserted. However, failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Please beware of possible changes to Elementary Files by the network at any time.

Syntax:

Test Command: AT+CRSM=?
Test Response: OK
Write Command: AT+CRSM=<command>[, <fileID>[, <P1>, <P2>, <P3>[, <data>][, <pathId>]]]
Write Response: +CRSM: <sw1>,<sw2>[,<response>]
OK
ERROR
+CME ERROR: <err>

Parameter Descriptions:

<command>

SIM command number.

176 READ BINARY
178 READ RECORD
192 GET RESPONSE
214 UPDATE BINARY
220 UPDATE RECORD
242 STATUS

<fileID>

Identifier for an elementary data file on SIM, if used by <command>.

<P1>, <P2>, <P3>

Parameters to be passed on by the Multi-Tech wireless modem to the SIM.

0...255

<data>

Information which shall be written to the SIM (hexadecimal character format).

<pathID>

Contains the directory path of an elementary file on a UICC in hexadecimal format (e.g. "7F105F50"). Up to 3 Dedicated Files (DFs) can be listed.

The <pathId> parameter is applicable only to UICCs.

Some types of UICCs may have Dedicated Files which are not unique, because the same FileID is allocated to several applications on the UICC and this way used twice or even more times.

Therefore, to access UICC files of SIM applications please use the optional parameter <pathId>.

UICC files of USIM applications are accessible without any need for the <pathId> parameter.

<sw1>, <sw2>

Status information from the SIM about the execution of the actual command. It is returned in both cases, on successful or failed execution of the command.

0...255

<response>

Response data in case of a successful completion of the previously issued command. "STATUS" and "GET RESPONSE" commands return data, which gives information about the currently selected elementary data field. This information includes the type of file and its size. After "READ BINARY" or "READ RECORD" commands the requested data will be returned. <response> is empty after "UPDATE BINARY" or "UPDATE RECORD" commands.

+CSCS Select TE Character Set

Description: Informs the modem which character set is used by the DTE. The modem can convert each character of entered or displayed strings. This is used to send, read or write short messages. See also +WPCS for phonebook character sets.

Syntax:

Command	Responses
Action Command: AT+CSCS=<Character Set>	OK
Read Command: AT+CSCS?	+CSCS: <Character Set> OK
Test Command: AT+CSCS=?	+CSCS: (list of supported <Character Set>s) OK

Values: **<Character Set>** **Character Table Set (ASCII String)**

GSM	GSM default alphabet
PCCP437	PC character set code page 437. **Default**
CUSTOM	User defined character set
HEX	Hexadecimal mode. No character set used; the user can read or write hexadecimal values.

Parameter Storage: The <character set> parameter is stored in EEPROM using AT&W. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CSCS=? Note: Get possible values	+CSCS: ("GSM","PCCP437","CUSTOM","HEX") OK
AT+CSCS="GSM" Note: GSM default alphabet	OK
AT+CSCS? Note: Get current value	+CSCS: "GSM" OK Note: GSM default alphabet

+CSIM Generic SIM Access

Description: AT+CSIM allows direct control of the SIM.
Compared to Restricted SIM Access command AT+CRSM, the definition of AT+CSIM allows the ME to take more control over the SIM interface.
However, the SIM Application Toolkit functionality is not supported by AT+CSIM. Therefore the following SIM commands cannot be used: TERMINAL PROFILE, ENVELOPE, FETCH and TEMINAL RESPONSE.

Syntax:

Test Command: AT+CSIM=?
Test Response: OK

Write Command: AT+CSIM=<length>, <command>
Write Response: +CSIM: <length>,<response>
OK
ERROR
+CME ERROR: <err>

Parameter Descriptions:

<length>
Length of <command> or <response> string.

<command>
Command passed on by the ME to the SIM.
Parameter length: maximum 257 Bytes.

<response>
Response data of the command returned by the SIM.
Parameter length: maximum 257 Bytes.

Example:

The following examples explain how to use AT+CSIM.

AT+CSIM=14,"A0A40000027F10"	Select DF-Telekom
+CSIM: 4,"9F19"	Command successful, length '19' of the response data
OK	
AT+CSIM=14,"A0A40000026F3A"	Select EF-ADN (Abbreviated dialing numbers)
+CSIM: 4,"9F0F"	Command successful, length '0F' of the response data
OK	
AT+CSIM=16,"A0C000000F000000"	Get Response
+CSIM: 34,"000002306F3A040011F0220102011C9000"	
OK	

+CSQ Signal Quality

Description: This command is used to read the *received signal strength indication* (<rssi>) and the *channel bit error rate* (<ber>) with or without a SIM card inserted.

Syntax:

Command	Responses
Action Command: AT+CSQ	+CSQ: <rssi>,<ber> OK

No Read and Test Commands

Values:

<rssi>: **Received Signal Strength**

0	-113 dBm or less
1	-111 dBm
2 to 30	-109 to -53 dBm
31	-51dBm or greater
99	not known or not detectable

<ber>: **Channel Bit Error Rate**

0…7	as RXQUAL values (GSM 05.08 [10])
99	not known or not detectable

Parameter Storage: None

Examples:

Command	Responses
AT+CSQ	+CSQ: 17,1 OK

+CSSN Supplementary Service Notifications

Description: This command configures the supplementary service related network initiated notifications.

Syntax:

Command	Response
Action Command: AT+CSSN= <n>, <m>	OK
Read Command: AT+CSSN?	+CSSN: <n>,<m> OK
Test Command: AT+CSSN=?	+CSSN: (list of supported <n>s), (list of supported <m>s) OK

Intermediated Response: +CSSI: <code1>[,<index>]

Unsolicited Response: +*CSSU:* <code2>[,<index>[,*<number>,<type>]]*

Values:

<n> **MO Supplementary Service Notification**

0 Disable. **Default**

1 Enable

When a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI is sent before any other MO call setup result codes.

<m> **MO Supplementary Service Notification**

0 Disable

1 Enable

When a supplementary service notification is received during a call, unsolicited result code +CSSU is sent.

<code1> **Manufacturer-Specific Service Code**

0 Unconditional call forwarding is active
1 Some of the conditional call forwarding actions are active
3 Call is waiting
4 Closed User Group call, with CUG <index>
5 Outgoing calls are barred
6 Incoming calls are barred
7 CLIR suppression rejected
8 Call has been deflected

<code2> **Service Code**

0 Forwarded call (Modem Call Setup)
1 Closed User Group call, with CUG <index>
2 Call has been put on hold (during a voice call, <number> & <type> fields may be present)
3 Call has been retrieved (during a voice call, <number> & <type> fields may be present)
4 Multiparty call entered (during a voice call, <number> & <type> fields may be present)
5 Call on hold has been released (during a voice call)
7 Call is being connected (alerting) with the remote party in alerting state in Explicit Call Transfer operation (during a voice call)
8 Call has been connected with the other remote party in Explicit Call Transfer operation (during a voice call, <number> & <type> fields may be present)
9 This is a deflected call (modem call setup)
10 Additional incoming call forwarded

<index> **Closed User Group**
String type

<number> **Phone Numbe**r
String type

<type> **TON/NPI Type of Address Octet of <number>** (Integer type)
129 ISDN / telephony numbering plan, national / international unknown.
145 ISDN / telephony numbering plan, international number
161 ISDN / telephony numbering plan, national number
128-255 Other values (refer GSM 04.08 section 10.5.4.7)

Parameter Storage: The <n> and <m> parameter are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CSSN=?	+CSSN: (0-1),(0-1) OK
AT+CSSN?	+CCSN: 0,0 OK
AT+CSSN=0,1	OK
ATD0123456789;	OK
	+CCWA: "9876543210",128,1 Note: Call waiting
AT+CHLD=2 Note: Accept the waiting call and place the active one on hold	OK
	+CSSU: 5 Note: The held call was released (by the remote)

+CSTA Select Type of Address

Description: This command selects the type of number for further dialing commands (D) according to GSM specifications.

Syntax:

Command	Responses
Action Command: AT+CSTA=<type>	OK
Read Command: AT+CSTA?	+CSTA: <type> OK
Test Command: AT+CSTA=?	+CSTA: (list of supported <types>s) OK

Values:

<type> **Type of Address Octet** (Integer Type)
129 ISDN / telephony plan, national / international unknown
145 ISDN / telephony plan, international number

Parameter Storage: The <type> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CSTA=?	+CSTA: (129, 145) OK
AT+ CSTA =145	OK
ATD33146290800; Note: International access code character "+"will be automatically added to each outgoing call	OK
AT+ CSTA =129	OK
ATD+33146290800; Note: International access code character "+"will be automatically added to each outgoing call	OK
AT+CSTA?	AT+ CSTA: 129 OK

+CUSD Unstructured Supplementary Service Data

Description: This command is used to:

- Enable or disable the CUSD indication sent to the application by the product when an incoming USSD is received
- Send and receive USSD strings

Note: The USSD supplementary service is described in GSM 02.90. It is based on sequences of digits which may be entered by a mobile user with a handset. A sequence entered is sent to the network which replies with an alphanumerical string, for display only, or for display plus request for the next sequence.

Syntax:

Command	Response
Action Command: AT+CUSD = <n> [,<str> [<dcs>]]	OK
Read Command: AT+CUSD?	+CUSD: <n> OK
Test Command: AT+CUSD=?	+CUSD: (list of supported <n>s) , OK

Unsolicited Response: +CUSD: *<m>[,<str>[,*<dsc>]]

Values:

<n> Requested Operation

- **0** Disable the result code presentation. **Default**
- **1** Enable the result code presentation
- **2** Cancel session (not applicable to read command response)

<m> USSD Status

- **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 network
- **3** Other local client has responded
- **4** Operation not supported
- **5** Network timeout

<str> USSD String
Converted in the selected character set (please refer to +CSCS); String type

<dcs> Data Coding Scheme
Integer type

Parameter Storage: The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

Examples:

Command	Responses
AT+CUSD=?	+ CUSD: (0-2) OK
AT+CUSD=1 "#123#"	OK
	+CUSD: 1,"02/08 report:0h04mn00S",15 Note: USSD response from network
AT+CUSD?	+CUSD=1 OK

D V.25 Dial Command

Description: This command causes the modem to perform whatever actions are necessary to establish communication between the DTE and the external PDN.

The V.25ter 'D' (Dial) command causes the modem to enter the V.25ter online data state and, with the DTE, to start the specified layer 2 protocol. The modem returns CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behavior after the online data state has been entered is described briefly in clause 9, for IP, of GSM 07.60. GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

Syntax:

Command	Responses
Action Command: ATD*<GPRS_SC_IP>[***<cid>] #	CONNECT

No Read and Test Commands

Values:

<GPRS_SC_IP> GPRS Service Code for IP
Digit string (value 99), which identifies a request to use the GPRS with IP (PDP types IP and PPP)

<cid> PDP Context Identifier
Range: 1-4; Integer type

Parameter Storage: None

Examples:

Command	Responses
ATD*99***1 #	CONNECT

Appendix A – Test Frequencies / Channel Lists

The following tables describe the frequencies and channels typically used when checking receiver paths for the UMTS Mini Card embedded modules.

GSM / EDGE Channels*

		Frequency (MHz)	
Band	**Channel**	**MX Tx**	**MS Rx**
GSM850	128	824.20	869.20
	190	836.60	881.60
	251	848.80	893.80
EGSM900	975	880.20	925.20
	979	881.00	926.00
	62	902.40	947.40
	65	903.00	948.00
	120	914.00	959.00
	124	914.80	959.80
DCS1800	512	1710.20	1805.20
	520	1711.80	1806.80
	697	1747.20	1842.20
	880	1783.80	1878.80
	885	1784.80	1879.80
PCS1900	512	1850.20	1930.20
	520	1851.80	1931.80
	661	1880.00	1960.00
	804	1908.60	1988.60
	810	1909.80	1989.80

* When testing, use the MS RX frequencies plus a 67 kHz offset.

For example, to test GSM850, channel 190, use a signal generator setting of 881.667 MHz.

WCDMA Channels*

Band	Tx Channel	UE Tx (MHz)	Rx Channel	UE Rx (MHz)
UMTS Band I (2100)	9612	1922.40	10562	2112.40
	9750	950.00	10700	2140.00
	9888	1977.60	10838	2167.60
UMTS Band II (1900)	9262	1852.40	9662	1932.40
	9400	1880.00	9800	1960.00
	9538	1907.60	9938	1987.60
UMTS Band V (850)	4132	826.40	4357	871.40
	4182	836.40	4407	881.40
	4233	846.60	4458	891.60
UMTS Band VIII (900)	2712	882.40	2937	927.40
	2787	897.40	3012	942.40
	2863	912.60	3088	957.60

* When testing, use the UE RX frequencies plus a 1.2 MHz offset.

For example, to test Band V (850 MHz), channel 4407, use a signal generator setting of 882.60 MHz.

Appendix B – HSDPA / HSUPA Categories

The following tables describe standard HSDPA and HSUPA categories.

HSDPA-Capable Terminals

Category	Maximum Number of Supported HS-DSCH Codes	Minimum Inter-TTI Interval	Number of Soft Values In Terminal's Hybrid ARQ Buffer	Theoretical Download Max. (L1 Peak Rate [Mbps])	Modulation
Category 1	5	3	19,200	1.2	16QAM, QPSK
Category 2	5	3	28,800	1.2	16QAM, QPSK
Category 3	5	2	28,800	1.8	16QAM, QPSK
Category 4	5	2	38,400	1.8	16QAM, QPSK
Category 5	5	1	57,600	3.6	16QAM, QPSK
Category 7	10	1	115,200	7.2	16QAM, QPSK
Category 9	15	1	172,800	10.0	16QAM, QPSK
Category 10	15	1	172,800	14.0	16QAM, QPSK
Category 11	5	2	14,400	0.9	QPSK
Category 12	5	1	28,800	1.8	QPSK

HSUPA-Capable Terminals

E-DCH Category	Maximum Number of E-DCH Codes Transmitted	Minimum Spreading Factor	Support for 10 ms; 2 ms TTI E-DCH	Maximum Data Rate with 10 ms TTI	Maximum Data Rate with 2 ms TTI
Category 1	1	SF4	10 ms only	0.72 Mbps	N/A
Category 2	2	SF4	10 ms and 2 ms	1.45 Mbps	1.45 Mbps
Category 4	2	SF2	10 ms and 2 ms	2.0 Mbps	2.91 Mbps
Category 6	4	SF2	10 ms and 2 ms	2.0 Mbps	5.76 Mbps

Appendix C – ASCII Table

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
NUL	0	00	SP	32	20	@	64	40	‘	96	60
SOH	1	01	!	33	21	A	65	41	a	97	61
STX	2	02	“	34	22	B	66	42	b	98	62
ETX	3	03	#	35	23	C	67	43	c	99	63
EOT	4	04	$	36	24	D	68	44	d	100	94
ENQ	5	05	%	37	25	E	69	45	e	101	95
ACK	6	06	&	38	26	F	70	46	f	102	96
BEL	7	07	’	39	27	G	71	47	g	103	97
BS	8	08	(	40	28	H	72	48	h	104	98
HT	9	09	)	41	29	I	73	49	i	105	99
LF	10	0A	*	42	2A	J	74	4A	j	106	6A
VT	11	0B	+	43	2B	K	75	4B	k	107	6B
FF	12	0C	,	44	2C	L	76	4C	l	108	6C
CR	13	0D	-	45	2D	M	77	4D	m	109	6D
SO	14	0E	.	46	2E	N	78	4E	n	110	6E
SI	15	0F	/	47	2F	O	79	4F	o	111	6F
DLE	16	10	0	48	30	P	80	50	p	112	70
XON	17	11	1	49	31	Q	81	51	q	113	71
DC2	18	12	2	50	32	R	82	52	r	114	72
XOFF	19	13	3	51	33	S	83	53	s	115	73
DC4	20	14	4	52	34	T	84	54	t	116	74
NAK	21	15	5	53	35	U	85	55	u	117	75
SYN	22	16	6	54	36	V	86	56	v	118	76
ETB	23	17	7	55	37	W	87	57	w	119	77
CAN	24	18	8	56	38	X	88	58	x	120	78
EM	25	19	9	57	39	Y	89	59	y	121	79
SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
FS	28	1C	<	60	3C	\	92	5C	|	124	7C
GS	29	1D	=	61	3D	]	93	5D	}	125	7D
RS	30	1E	>	62	3E	^	94	5E	~	126	7E
US	31	1F	?	63	3F	_	95	5F	DEL	127	7F

Index

!

!AUTH Run GSM Algorithm on SIM 41
!BAND Select / Return Frequency Band Set 15
!GETBAND Return the Current Active Band 19
!GETRAT Return the Current Active Radio Access Technology 19
!GRELIMEI Return the Modem's Production TAC 19
!GRESET Reset Modem 26
!GSMINFO Return 2G Network Information 20
!GSTATUS Return Operational Status 21
!GVER Return the Firmware Version 23
!ICCID Return (U)SIM Card's ICCID 41
!MXSTATS Display/Clear 27.010 Statistics 40
!PCTEMP Return Current Temperature Information 24
!PCVOLT Return Current Power Supply Voltage Information 25
!POWERDOWN Power Down System 25
!REL Return Active Protocol/Revision 26
!RESET Reset Modem 26
!SCACT Activate/Deactivate PDP Context for FIFO Interface 27
!SCDFTPROF Set/Return Default Profile ID 28
!SCDNS Set/Return Profile ID DNS Address 28
!SCPADDR Return IP Address for Specified PDP Context 29
!SCPROF Set/Return SWI-Specific Profile Information 29
!SCPROFDEL Erase Profile Information 30
!SCWINS Set/Return Profile's WINS Addresses 30
!SDNOTINSTALLED Return SD Installation Status 30
!SELMODE Set/Return Current Service Domain 31
!SELRAT Set/Return Current Radio Access Technology (RAT) 31
!SMSRETRY Set/Return SMS Retry Period and Interval 32
!SMSSTSEN Enable/Disable SMS Status Reports 33
!SPN Return (U)SIM Card's SPN 42
!SWICALLPROG Enable/Disable Call Progress Notification 33
!TIME Set/Return Current Time of Day 36
!UDINFO Return Information from Active USB Descriptor 37

&

&D Set DTR Function Mode 43
&F Restore Factory Settings 44
&S Set DSR Signal 44
&T Auto-Tests 45
&V Return Operating Mode AT Configuration Parameters 39
&V Display Configuration 46
&W Save Configuration 47

*

*CNTI Report Current, Available, Supported Network Technologies 17

^

^CARDMODE Return SIM Card Mode 16
^HVER Return the Modem Hardware Version 24
^SYSCONFIG Set/Return System Configuration Information 35
^SYSINFO Return Service Status Information 36

+

+CBM Cell Broadcast Message Displayed 62
+CBST Bearer Type Selection 82
+CCFC Call Forwarding 83
+CCUG Closed User Group 84
+CCWA Call Waiting 85
+CDS SMS Status Report After Sending Message 62
+CDSI Incoming SMS Status Report 63
+CFUN Set Phone Functionality 86
+CGACT PDP Context Activate or Deactivate 87
+CGATT GPRS Attach or Detach 88
+CGCLASS GPRS Mobile Station Class 88
+CGDATA Enter Data State 89
+CGDCONT Define PDP Context 89
+CGEQMIN 3G Quality of Service Profile 90
+CGEQREQ 3G Quality of Service Profile 93
+CGEREP GPRS Event Reporting 96
+CGMI Manufacturer Identification 97
+CGMR Request Revision Identification 98
+CGPADDR Show PDP Address 98
+CGREG GPRS Network Registration Status 99
+CGSMS Select Service for Mobile Originated SMS Messages 100
+CHLD Call Related Supplementary Services 101
+CHUP Hang Up Call 102
+CIMI Request IMSI 102
+CIND Indicator Control 103
+CLCK Facility Lock 104
+CLIP Calling Line Identification Presentation 105
+CLIR Calling Line Identification Restriction 106
+CLVL Loudspeaker Volume Level 107
+CME ERROR ME Error Result Codes 108
+CMEE Report Mobile Equipment Errors 109
+CMER Mobile Equipment Event Reporting 109
+CMGC Send an SMS 63
+CMGD Delete Message 64
+CMGF Message Format 65
+CMGL List Messages 65
+CMGR Read Message 67
+CMGS Send an SMS 63
+CMGS Send Message 69
+CMGW Write Message to Memory 70

+CMMS More Messages to Send 72
+CMS ERROR Message Service Failure Result Code 73
+CMSS Send Short Messages from Storage..... 74
+CMT Incoming Message Displayed 74
+CMTI Location of Stored Message..... 75
+CMUT Microphone Mute Control 111
+CNMA New Message Acknowledgement to ME/TE... 73
+CNMI New Message Indication..... 75
+CNUM Subscriber Number 112
+COLP Connected Line Identification Presentation.... 113
+COPN Read Operator Name 114
+COPS Operator Selection..... 114
+CPAS Phone Activity Status 116
+CPBF Find Phonebook Entries 117
+CPBR Read Phonebook Entries 119
+CPBS Select Phonebook Memory Storage..... 121
+CPBW Write Phonebook Entry 122
+CPIN Enter PIN..... 125
+CPMS Preferred Message Storage..... 76
+CPOL Preferred Operator List 126
+CPUC Price Per Unit and Currency Table 128
+CPWD Change Password..... 128
+CQI Enable/Disable/Return Averaged CQI Return 17
+CR Service Reporting Control..... 129
+CRD Cellular Result Codes 130
+CREG Network Registration 131
+CRLP Radio Link Protocol Parameters..... 132
+CSCA SMS Service Center Address 77
+CSCB Select Cell Broadcast Message Indication..... 78
+CSCS Select TE Character Set 134
+CSDH Show Text Mode Parameters 79
+CSIM Generic SIM Access 135
+CSMP Set Text Mode Parameters..... 79
+CSMS Select Message Service 81
+CSQ Signal Quality..... 136
+CSSN Supplementary Service Notifications 136
+CSTA Select Type of Address 138
+CUSD Unstructured Supplementary Service Data.... 138
+DR V42bis Data Compression Report 47
+DSR V42bis Data Compression..... 48
+ECIO Return Total Energy Per Chip Per Power Density Value..... 18
+ETFCI Enable/Disable/Return E-TFCI Average Value18
+GCAP Request Capabilities List 49
+GMI Request Manufacturer Identification..... 49
+GMM Request Model Identification..... 49
+GMR Request Revision Identification 50
+GSN Product Serial Number..... 50
+ICF DTE-DCE Character Framing 51
+IFC DTE-DCE Local Data Flow Control..... 52
+IPR Set Fixed DTE Rate..... 53
+RSCP Return Received Signal Code Power..... 27
+UPSC Return Primary Scrambling Code 38
+USET Return WCDMA Set Information 38

3

3G Quality of Service Profile +CGEQMIN..... 90
3G Quality of Service Profile +CGEQREQ..... 93

A

A Answer Incoming Call..... 54
Activate/Deactivate PDP Context for FIFO Interface !SCACT..... 27
Answer Incoming Call A..... 54
AT+CRSM Restricted SIM Access 133
ATS6 Set Pause before Blind Dialing.....59
ATS8 Set Number of Seconds for Comma Dialing Modifier.....59
Automatic Disconnect Delay S10 60
Auto-Tests &T.....45

B

Bearer Type Selection +CBST 82

C

Call Forwarding +CCFC 83
Call Related Supplementary Services +CHLD 101
Call Waiting +CCWA 85
Calling Line Identification Presentation +CLIP.....105
Calling Line Identification Restriction +CLIR.....106
Cell Broadcast Message Displayed +CBM.....62
Cellular Result Codes +CRD 130
Change Password +CPWD 128
Closed User Group +CCUG 84
Connected Line Identification Presentation +COLP 113
Connection Completion Timeout S7 59

D

D Dial.....54
D V.25 Dial Command.....139
D> Originate a Call to Phone Number in Current Memory 55
Define PDP Context +CGDCONT 89
Delete Message +CMGD.....64
Dial D.....54
Disconnect Existing Connections H.....56
Display Configuration &V.....46
Display Product Identification Information I 57
Display/Clear 27.010 Statistics !MXSTATS 40
DTE-DCE Character Framing +ICF 51
DTE-DCE Local Data Flow Control +IFC.....52

E

E Echo.....56
Echo E.....56
Enable/Disable Call Progress Notification !SWICALLPROG 33
Enable/Disable SMS Status Reports !SMSSTSEN 33
Enable/Disable/Return Averaged CQI Return +CQI.....17
Enable/Disable/Return E-TFCI Average Value +ETFCI18
Enter Data State +CGDATA.....89
Enter PIN +CPIN 125
Erase Profile Information !SCPROFDEL 30

F

Facility Lock +CLCK 104
Find Phonebook Entries +CPBF.....117

G

Generic SIM Access +CSIM 135
GPRS Attach or Detach +CGATT 88
GPRS Event Reporting +CGEREP.....96
GPRS Mobile Station Class +CGCLASS.....88

GPRS Network Registration Status +CGREG 99
GSM / EDGE Channels 140

H

H Disconnect Existing Connections 56
Hang Up Call +CHUP 102
HSDPA-Capable Terminals 142
HSUPA-Capable Terminals 142

I

I Display Product Identification Information 57
Incoming Message Displayed +CMT 74
Incoming SMS Status Report +CDSI 63
Indicator Control +CIND 103

L

Line Termination Character S3 58
List Messages +CMGL 65
Location of Stored Message +CMTI 75
Loudspeaker Volume Level +CLVL 107

M

Manufacturer Identification +CGMI 97
ME Error Result Codes +CME ERROR 108
Message Format +CMGF 65
Message Service Failure Result Code +CMS ERROR 73
Microphone Mute Control +CMUT 111
Mobile Equipment Event Reporting +CMER 109
More Messages to Send +CMMS 72

N

Network Registration +CREG 131
New Message Acknowledgement to ME/TE +CNMA... 73
New Message Indication +CNMI 75

O

O Switch from Command Mode to Data Mode 57
Operator Selection +COPS 114
Originate a Call to Phone Number in Current Memory D> 55

P

PDP Context Activate or Deactivate +CGACT 87
Phone Activity Status +CPAS 116
Power Down System !POWERDOWN 25
Preferred Message Storage +CPMS 76
Preferred Operator List +CPOL 126
Price Per Unit and Currency Table +CPUC 128
Product Serial Number +GSN 50

R

Radio Link Protocol Parameters +CRLP 132
Read Message +CMGR 67
Read Operator Name +COPN 114
Read Phonebook Entries +CPBR 119
Report Current, Available, Supported Network Technologies *CNTI 17
Report Mobile Equipment Errors +CMEE 109
Request Capabilities List +GCAP 49
Request IMSI +CIMI 102
Request Manufacturer Identification +GMI 49
Request Model Identification +GMM 49
Request Revision Identification +CGMR 98
Request Revision Identification +GMR 50
Reset Modem !GRESET 26
Reset Modem !RESET 26
Response Formatting Character S4 58
Restore Factory Settings &F 44
Restricted SIM Access AT+CRSM 133
Return (U)SIM Card's ICCID !ICCID 41
Return (U)SIM Card's SPN !SPN 42
Return 2G Network Information !GSMINFO 20
Return Active Protocol/Revision !REL 26
Return Current Power Supply Voltage Information !PCVOLT 25
Return Current Temperature Information !PCTEMP 24
Return Information from Active USB Descriptor !UDINFO 37
Return IP Address for Specified PDP Context !SCPADDR 29
Return Operating Mode AT Configuration Parameters &V 39
Return Operational Status !GSTATUS 21
Return Primary Scrambling Code +UPSC 38
Return Received Signal Code Power +RSCP 27
Return SD Installation Status !SDNOTINSTALLED 30
Return Service Status Information ^SYSINFO 36
Return SIM Card Mode ^CARDMODE 16
Return the Current Active Band !GETBAND 19
Return the Current Active Radio Access Technology !GETRAT 19
Return the Firmware Version !GVER 23
Return the Modem Hardware Version ^HVER 24
Return the Modem's Production TAC !GRELIMEI 19
Return Total Energy Per Chip Per Power Density Value +ECIO 18
Return WCDMA Set Information +USET 38
Run GSM Algorithm on SIM !AUTH 41

S

S0 Set Number of Rings Before Automatic Answer 57
S10 Automatic Disconnect Delay 60
S3 Line Termination Character 58
S4 Response Formatting Character 58
S5 Set Command Line Editing Character 58
S7 Connection Completion Timeout 59
Save Configuration &W 47
Select / Return Frequency Band Set !BAND 15
Select Cell Broadcast Message Indication +CSCB 78
Select Message Service +CSMS 81
Select Phonebook Memory Storage +CPBS 121
Select Service for Mobile Originate SMS Messages +CGSMS 100
Select TE Character Set +CSCS 134
Select Tone Dialing T 60
Select Type of Address +CSTA 138
Send an SMS _CMGS 63
Send an SMS +CMGC 63
Send Message +CMGS 69
Send Short Messages from Storage +CMSS 74

Service Reporting Control +CR 129
Set All Current Parameters to User-Defined Profile Z .. 61
Set Command Line Editing Character S5 58
Set Connect Result Code Format and Call Monitoring X 61
Set DSR Signal &S 44
Set DTR Function Mode &D 43
Set Fixed DTE Rate +IPR 53
Set Number of Rings Before Automatic Answer S0 57
Set Number of Seconds for Comma Dialing Modifier ATS8 59
Set Pause before Blind Dialing ATS6 59
Set Phone Functionality +CFUN 86
Set Result Code Format Mode V 60
Set Text Mode Parameters +CSMP 79
Set/Return Current Radio Access Technology (RAT) !SELRAT 31
Set/Return Current Service Domain !SELMODE 31
Set/Return Current Time of Day !TIME 36
Set/Return Default Profile ID !SCDFTPROF 28
Set/Return Profile ID DNS Address !SCDNS 28
Set/Return Profile's WINS Addresses !SCWINS 30
Set/Return SMS Retry Period and Interval !SMSRETRY 32
Set/Return SWI-Specific Profile Information !SCPROF 29
Set/Return System Configuration Information ^SYSCONFIG 35
Show PDP Address +CGPADDR 98
Show Text Mode Parameters +CSDH 79
Signal Quality +CSQ 136
SMS Service Center Address +CSCA 77
SMS Status Report After Sending Message +CDS 62
Subscriber Number +CNUM 112
Supplementary Service Notifications +CSSN 136
Switch from Command Mode to Data Mode O 57

T

T Select Tone Dialing 60

U

Unstructured Supplementary Service Data +CUSD 138

V

V Set Result Code Format Mode 60
V.25 Dial Command D 139
V42bis Data Compression +DS 48
V42bis Data Compression Report +DR 47

W

WCDMA Channels 141, 147
Write Message to Memory +CMGW 70
Write Phonebook Entry +CPBW 122

X

X Set Connect Result Code Format and Call Monitoring 61

Z

Z Set All Current Parameters to User-Defined Profile .. 61