



AT Commands Interface Guide

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AT Commands Interface Guide

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Content

| | |
|--|-----------|
| 1 Introduction | 11 |
| 1.1 Scope of this document..... | 11 |
| 1.2 Related documents..... | 11 |
| 1.3 ETSI secretariat..... | 11 |
| 1.4 Definitions..... | 12 |
| 1.5 Presentation rules..... | 12 |
| 2 AT commands features | 13 |
| 2.1 CENTEL line settings..... | 13 |
| 2.2 Command line..... | 13 |
| 2.3 Information responses and result codes | 13 |
| 3 General behaviors | 14 |
| 3.1 SIM Insertion, SIM Removal..... | 14 |
| 3.2 Background initialization..... | 15 |
| 4 General commands | 16 |
| 4.1 Manufacturer identification +CGMI | 16 |
| 4.2 Request model identification +CGMM | 16 |
| 4.3 Request revision identification +CGMR | 17 |
| 4.4 Product Serial Number +CGSN..... | 17 |
| 4.5 Select TE character set +CSCS | 18 |
| 4.6 CENTEL Phonebook Character Set +WPCS | 19 |
| 4.7 Request IMSI +CIMI | 20 |
| 4.8 Card Identification +CCID | 21 |
| 4.9 Capabilities list +GCAP | 21 |
| 4.10 Repeat last command A/ | 22 |
| 4.11 Power off +CPOF | 22 |
| 4.12 Set phone functionality +CFUN | 23 |
| 4.13 Phone activity status +CPAS | 24 |
| 4.14 Report Mobile Equipment errors +CMEE | 25 |
| 4.15 Keypad control +CKPD..... | 26 |
| 4.16 Clock Management +CCLK | 26 |
| 4.17 Alarm Management +CALA | 28 |
| 4.18 Select type of address +CSTA | 28 |
| 4.19 Call mode +CMOD..... | 29 |
| 4.20 Hangup call +CHUP..... | 29 |
| 4.21 S Command..... | 30 |
| 4.22 Manufacturer identification +CGMI | 31 |
| 4.23 Request model identification +CGMM | 31 |
| 4.24 Request revision identification +CGMR..... | 31 |
| 5 Call Control commands | 32 |
| 5.1 Dial command D..... | 32 |
| 5.2 Hang-Up command H..... | 33 |

| | |
|--|-----------|
| 5.3 Answer a call A | 35 |
| 5.4 Remote disconnection | 36 |
| 5.5 Extended error report +CEER..... | 37 |
| 5.6 DTMF signals +VTD, +VTS | 38 |
| 5.7 Redial last telephone number ATDL | 39 |
| 5.9 Automatic answer ATSO..... | 40 |
| 5.10 Incoming Call Bearer +CICB..... | 41 |
| 5.11 Single Numbering Scheme +CSNS | 42 |
| 5.12 Gain control +VGR, +VGT | 43 |
| 5.13 Microphone Mute Control +CMUT | 46 |
| 5.14 Speaker & Microphone selection +SPEAKER | 47 |
| 5.15 Echo Cancellation +ECHO | 48 |
| 5.16 SideTone modification +SIDET | 49 |
| 5.17 Initialize Voice Parameters +VIP..... | 49 |
| 5.18 Ring Melody Playback +CRMP | 50 |
| 5.19 Ringer Sound Level +CRSL | 51 |
| 6 Network service commands | 52 |
| 6.1 Signal Quality +CSQ..... | 52 |
| 6.2 Operator selection +COPS | 53 |
| 6.3 Network registration +CREG | 54 |
| 6.5 Selection of Preferred PLMN list +CPLS | 55 |
| 6.6 Preferred operator list +CPOL | 57 |
| 6.7 Read operator name +COPN..... | 60 |
| 7 Security commands | 61 |
| 7.1 Enter PIN +CPIN | 61 |
| 7.3 PIN remaining attempt number +CPINC..... | 64 |
| 7.4 Facility lock +CLCK..... | 65 |
| 7.5 Change password +CPWD | 67 |
| 8 Phonebook commands | 69 |
| 8.1 Select phonebook memory storage +CPBS | 69 |
| 8.2 Read phonebook entries +CPBR | 69 |
| 8.3 Find phonebook entries +CPBF | 70 |
| 8.4 Write phonebook entry +CPBW..... | 72 |
| 8.5 Phonebook phone search +CPBP..... | 74 |
| 8.6 Move action in phonebook +CPBN | 75 |
| 8.7 Subscriber number +CNUM | 77 |
| 8.10 Set Voice Mail Number +CSVM..... | 78 |
| 9 Short Messages commands | 79 |
| 9.1 Parameters definition..... | 79 |
| 9.2 Select message service +CSMS | 80 |
| 9.3 New Message Acknowledgement +CNMA | 81 |
| 9.4 Preferred Message Storage +CPMS..... | 83 |
| 9.5 Preferred Message Format +CMGF..... | 84 |
| 9.6 Save Settings +CSAS..... | 86 |
| 9.7 Restore settings +CRES..... | 86 |
| 9.8 Show text mode parameters +CSDH..... | 87 |
| 9.9 New message indication +CNMI..... | 88 |

| | |
|---|------------|
| 9.10 Read message +CMGR | 90 |
| 9.11 List message +CMGL..... | 92 |
| 9.12 Send message +CMGS..... | 94 |
| 9.13 Write Message to Memory +CMGW..... | 95 |
| 9.14 Send Message From Storage +CMSS | 96 |
| 9.15 Set Text Mode Parameters +CSMP | 97 |
| 9.16 Delete message +CMGD | 99 |
| 9.17 Service center address +CSCA..... | 100 |
| 9.20 Message status modification +WMSC | 101 |
| 9.21 Message overwriting +WMGO..... | 102 |
| 9.22 Unchange SMS Status +WUSS | 103 |
| 9.23 Cell Broadcast Message Types +CSCB..... | 104 |
| 9.24 Cell Broadcast Message Identifiers +WCBM..... | 105 |
| 10 Supplementary Services commands..... | 105 |
| 10.1 Call forwarding +CCFC..... | 105 |
| 10.2 Call barring +CLCK..... | 108 |
| 10.3 Modify SS password +CPWD..... | 109 |
| 10.4 Call waiting +CCWA..... | 110 |
| 10.5 Calling line identification restriction +CLIR | 111 |
| 10.6 Calling line identification presentation +CLIP | 112 |
| 10.7 Connected line identification presentation +COLP | 113 |
| 10.12 Call related supplementary services +CHLD..... | 114 |
| 10.13 List current calls +CLCC..... | 115 |
| 10.14 Supplementary service notifications +CSSN..... | 116 |
| 10.15 Unstructured supplementary service data +CUSD..... | 117 |
| 10.16 Closed user group +CCUG | 119 |
| 11 Data commands | 120 |
| 11.1 Using AT Commands during a data connection..... | 120 |
| 11.2 Bearer type selection +CBST..... | 120 |
| 11.4 Service reporting control +CR..... | 122 |
| 11.5 Cellular result codes +CRC..... | 123 |
| 11.6 DTE-DCE local rate reporting +ILRR..... | 124 |
| 14 V24-V25 commands..... | 125 |
| 14.1 Fixed DTE rate +IPR | 125 |
| 14.2 DTE-DCE character framing +ICF | 127 |
| 14.3 DTE-DCE local flow control +IFC | 128 |
| 14.4 Set DCD signal &C | 129 |
| 14.5 Set DTR signal &D | 130 |
| 14.6 Set DSR signal &S..... | 131 |
| 14.7 Back to online mode O..... | 131 |
| 14.8 Result code suppression Q..... | 132 |
| 14.9 DCE response format V..... | 132 |
| 14.10 Default configuration Z..... | 133 |
| 14.11 Save configuration &W..... | 133 |
| 14.12 Auto-tests &T..... | 134 |
| 14.13 Echo E..... | 135 |
| 14.14 Restore factory settings &F..... | 135 |
| 14.15 Display configuration &V..... | 136 |
| 14.16 Request identification information I..... | 137 |

| | |
|---|------------|
| 14.17 Data / Commands Multiplexing +WMUX | 138 |
| 15 Specific AT commands | 139 |
| 15.1 Cell environment description +CCED | 139 |
| 15.2 Automatic RxLev indication +CCED | 141 |
| 15.3 General Indications +WIND | 142 |
| 15.4 Analog digital converters measurements +ADC | 145 |
| 15.5 Mobile Equipment event reporting +CMER | 146 |
| 15.6 Indicator control +CIND | 148 |
| 15.7 Mobile equipment control mode +CMEC | 149 |
| 15.8 Read Language Preference +WLPR | 150 |
| 15.9 Write Language Preference +WLPW | 152 |
| 15.10 Read GPIO value +WIOR | 153 |
| 15.11 Write GPIO value +WIOW | 154 |
| 15.12 Input/Output Management +WIOM | 155 |
| 15.13 Abort command +WAC | 157 |
| 15.14 Play tone +WTONE | 158 |
| 15.15 Play DTMF tone +WDTMF | 160 |
| 15.16 CENTEL Downloading +WDWL | 161 |
| 15.17 CENTEL Voice Rate +WVR | 162 |
| 15.18 Data Rate +WDR | 163 |
| 15.19 Hardware Version +WHWV | 164 |
| 15.20 Date of Production +WDOP | 164 |
| 15.21 CENTEL Select Voice Gain +WSVG | 165 |
| 15.22 CENTEL Status Request +WSTR | 166 |
| 15.23 CENTEL Scan +WSCAN | 167 |
| 15.24 CENTEL Ring Indicator Mode +WRIM | 168 |
| 15.25 CENTEL 32kHz Power down Mode +W32K | 169 |
| 15.26 CENTEL Change Default Melody +WCDM | 170 |
| 15.27 CENTEL Software version +WSSW | 171 |
| 15.28 CENTEL Custom Character Set +WCCS | 172 |
| 15.29 CENTEL LoCK +WLCK | 174 |
| 15.30 CPHS command: +CPHS | 176 |
| 15.31 Unsolicited result : CENTEL Voice Mail Indicator : +WVMI | 179 |
| 15.32 Unsolicited result : CENTEL diverted call indicator: +WDCI | 180 |
| 15.33 CENTEL network operator name: +WNON | 181 |
| 15.34 CENTEL CPHS information: +WCPI | 182 |
| 15.35 CENTEL customer service profile: +WCSP | 183 |
| 15.36 CENTEL Battery Charge Management +WBCM | 184 |
| 15.37 Unsolicited result : CENTEL Battery Charge Indication +WBCI | 187 |
| 15.38 Features Management +WFM | 188 |
| 15.39 Commercial Features Management +WCFM | 190 |
| 15.40 CENTEL Customer storage mirror +WMIR | 191 |
| 15.41 CENTEL Change Default Player +WCDP | 191 |
| 15.42 CENTEL CPHS Mail Box Number: +WMBN | 192 |
| 15.43 CENTEL Alternate Line Service: +WALS | 194 |
| 15.44 CENTEL Open AT control command +WOPEN | 195 |
| 15.45 CENTEL Reset +WRST | 197 |
| 15.46 Set Standard Tone +WSST | 198 |
| 15.47 CENTEL Location +WLOC | 199 |
| 15.48 CENTEL Bus Read +WBR | 202 |
| 15.49 CENTEL Bus Write +WBW | 204 |
| 15.50 CENTEL Bus Management +WBM | 206 |
| 15.51 CENTEL Hang-up +WATH | 211 |

| | |
|--|------------|
| 15.52 Write IMEI +WIMEI | 212 |
| 15.53 Write IMEI SVN: +WSVN..... | 213 |
| 15.54 CENTEL multi-band selection command: +WMBS | 214 |
| 15.55 Centel Matrix +TMTX..... | 215 |
| 16 SIM TOOLKIT..... | 216 |
| 16.1 Overview of SIM Application Toolkit..... | 216 |
| 16.2 Messages exchanged during a SIM ToolKit operation. | 218 |
| 16.3 SIM TOOLKIT COMMANDS..... | 219 |
| 17 GPRS commands | 233 |
| 17.1 Define PDP Context +CGDCONT | 233 |
| 17.2 Quality of Service Profile (Requested) +CGQREQ..... | 235 |
| 17.3Quality of Service Profile (Minimum acceptable) +CGQMIN..... | 239 |
| 17.4 GPRS attach or detach +CGATT..... | 241 |
| 17.5 PDP context activate or deactivate +CGACT..... | 242 |
| 17.6 Enter data state +CGDATA..... | 244 |
| 17.7 GPRS mobile station class +CGCLASS..... | 245 |
| 17.8 Select service for MO SMS messages +CGSMS | 247 |
| 17.9 GPRS event reporting +CGEREP | 247 |
| 17.10 GPRS network registration status +CGREG | 250 |
| 17.11 Request GPRS IP service 'D' | 251 |
| 17.12 Network requested PDP context activation | 252 |
| 17.13 Automatic response to a network request for PDP context activation +CGAUTO | 253 |
| 17.14 Manual response to a network request for PDP context activation +CGANS..... | 255 |
| 17.15 Show PDP address +CGPADDR..... | 257 |
| 17.16 Cellular result codes +CRC | 258 |
| 17.17 Service reporting control +CR | 259 |
| 17.18 Extended error report +CEER | 260 |
| 17.19 GPRS PARAMETERS CUSTOMIZATION: +WGPRS | 261 |
| 17.20 GPRS service quality: +CGQREQ | 262 |
| 17.21 QUALITY OF service Profile (Minimum acceptable) : +CGQMIN | 265 |
| 17.20 Full AT GPRS commands examples | 267 |
| 18. TCP/IP | 268 |
| 18.1 AT+ CIPSTART | 268 |
| 18.2 AT+CIPSEND | 268 |
| 18.3 AT+CIPCLOSE | 269 |
| 18.4 AT+CIPSHUT..... | 269 |
| 18.5 AT+CLPORT | 269 |
| 18.6 AT+CSTT | 270 |
| 18.7 AT+CIICR..... | 270 |
| 18.8 AT+CIFSR..... | 270 |
| 18.9 AT+CIPSTATUS..... | 271 |
| 18.10 AT+CIPHEAD | 271 |
| 18.11 AT+CIPATS | 272 |
| 18.12 AT+CIPSPRT..... | 272 |
| 18.12 AT+CIPCSGP | 273 |
| 18.14 TCP/IP Examples | 273 |
| 19 GSM string..... | 274 |

| | |
|---|------------|
| 19.1 Call forwarding..... | 274 |
| 19.2 Change/unlock password (PIN and PIN2)..... | 277 |
| 19.3 Call waiting | 277 |
| 19.4 Call barring | 277 |
| 19.5 Number presentation | 278 |
| 20 Appendixes | 280 |
| 20.1 ME error result code : +CME ERROR: <error> | 280 |
| 20.2 Message service failure result code: +CMS ERROR : <er> | 281 |
| 20.3 Specific error result codes | 281 |
| 20.4 Failure Cause from GSM 04.08 recommendation (+CEER) | 282 |
| 20.5 Specific Failure Cause for +CEER | 284 |
| 20.6 GSM 04.11 Annex E-2: Mobile originating SM-transfer | 284 |

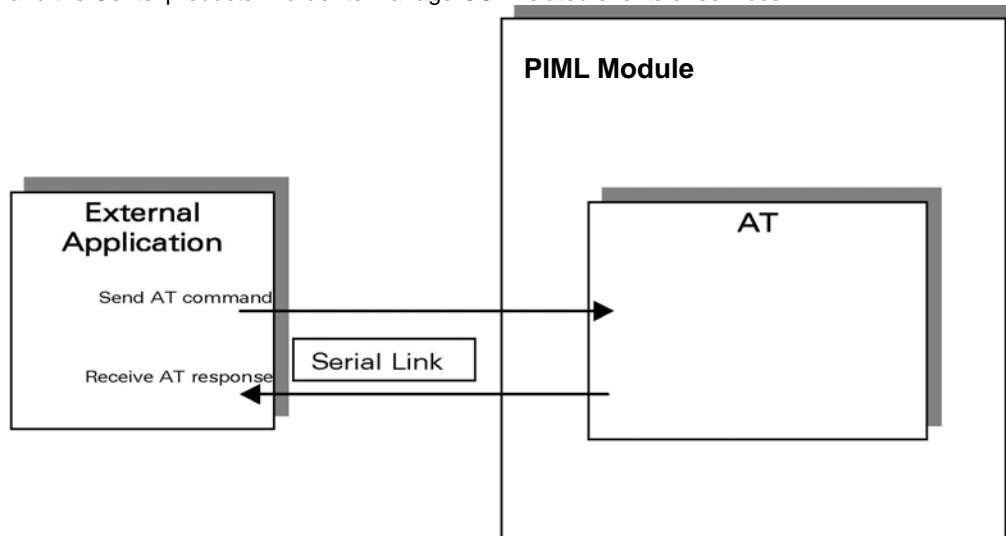
Overview

The aim of this document is to provide CENTEL customers with a full description of the AT commands.

1 Introduction

1.1 Scope of this document

This document describes the AT-command based messages exchanged between an application and the Centel products in order to manage GSM related events or services.



1.2 Related documents

This interface specification is based on the following recommendations:

- [1] ETSI GSM 07.05: Digital cellular telecommunications system (Phase 2); Use of DTE-DCE interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
- [2] ETSI GSM 07.07: Digital cellular telecommunications system (Phase 2); AT command set for GSM Mobile Equipment (ME)
- [3] ITU-T Recommendation V.25 ter: Serial asynchronous automatic dialling and control
- [4] ETSI GSM 03.40: Digital cellular telecommunications system (Phase 2); Technical implementation of the Short Message Service (SMS) Point-to-Point (PP)
- [5] ETSI GSM 03.38: Digital cellular telecommunications system (Phase 2); Alphabets and language-specific information
- [6] ETSI GSM 04.80: Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3, Supplementary service specification, Formats and coding

1.3 ETSI secretariat

The following addresses may be of use in obtaining the latest GSM recommendations:

Postal address: F-06921 Sophia Antipolis CEDEX – France

Office address: 650 Route des Lucioles – Sophia Antipolis – Valbonne – France

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1.4 Definitions

The words, "Mobile Station" (MS) or "Mobile Equipment" (ME) are used for mobile terminals supporting GSM services.

A call from a GSM mobile station to the PSTN is called a "mobile originated call" (MOC) or "outgoing call", and a call from a fixed network to a GSM mobile station is called a "mobile terminated call" (MTC) or "incoming call".

In this document, the word "product" refers to any CENTEL product supporting the AT commands interface.

1.5 Presentation rules

In the following, the AT commands are presented with as much precision as possible, through three paragraphs. A "Description" paragraph provides general information on the AT command (or response) behaviour. A "Syntax" paragraph describes the way to use it, the possible answers, through a readable format. A "Defined values" paragraph provides parameters values, as well for the AT command as for the corresponding responses.

Schemas are provided where necessary.

2 AT commands features

2.1 CENTEL line settings

A serial link handler is set with the following default values (factory settings):
baud rate is 9600 bit/s, 8 bits data, 1 stop bit, no parity, no flow control.
Please use the +IPR to change the baud rate

2.2 Command line

Commands always start with AT (which means Attention) and finish with a <CR> character.

2.3 Information responses and result codes

Responses start and end with <CR><LF> (except for the ATV0 DCE response format) and the ATQ1 (result code suppression) commands.

- If command syntax is incorrect, the "ERROR" string is returned,.
- If command syntax is correct but transmitted with wrong parameters, the +CME ERROR: <Err> or +CMS ERROR: <SmsErr> strings is returned with adequate error codes if CMEE was previously set to 1. By default, CMEE is set to 0, and the error message is only "ERROR".
- If the command line has been executed successfully, an "OK" string is returned.

In some cases, such as "AT+CPIN?" or (unsolicited) incoming events, the product does not return the "OK" string as a response.

In the following examples <CR> and <CR><LF> are intentionally omitted.

3 General behaviors

3.1 SIM Insertion, SIM Removal

SIM card Insertion and Removal procedures are supported. There are software functions relying on positive reading of the hardware SIM detect pin. This pin state (open/closed) is permanently monitored.

When the SIM detect pin indicates that a card is present in the SIM connector, the product tries to set up a logical SIM session. The logical SIM session will be set up or not depending on whether the detected card is a SIM Card or not.

The AT+CPIN? command delivers the following responses:

- If the SIM detect pin indicates "absent", the response to AT+CPIN? is "+CME ERROR 10" (SIM not inserted).
- If the SIM detect pin indicates "present", and the inserted card is a SIM card, the response to AT+CPIN? is "+CPIN: xxx" depending on SIM PIN state.
- If the SIM detect pin indicates "present", and the inserted card is not a SIM card, the response to AT+CPIN? is "+CME ERROR 10".
- These last two states are not provided immediately due to background initialization. Between the hardware SIM detect pin indicating "present" and the final results, the AT+CPIN? sends "+CME ERROR: 515" (Please wait, init in progress).

When the SIM detect pin indicates card absence, and if a SIM Card was previously inserted, an IMSI detach procedure is performed, all user data is removed from the product (Phonebooks, SMS etc.). The product then switches to emergency mode.

3.2 Background initialization

After entering the PIN (Personal Identification Number), some SIM user data files are loaded into the product (phonebooks, SMS status, etc.). Please be aware that it might take some time to read a large phonebook.

The AT+CPIN? command response occurs after the PIN checking. After this response user data is loaded in background. This means that some data may not be available just when PIN entry is confirmed by 'OK'. The reading of phonebooks will then be refused by "+CME ERROR: 515" or "+CMS ERROR: 515" meaning, "Please wait, service is not available yet, init in progress".

This type of answer may be sent by the product at several points:

- when trying to execute another AT command before the previous one is completed (before response),
- when asking for +CPIN? status immediately after SIM insertion and before the product has determined if the inserted card is a valid SIM card.

4 General commands

4.1 Manufacturer identification +CGMI

4.1.1 Description :

This command gives the manufacturer identification.

4.1.2 Syntax :

Command syntax : AT+CGMI

| Command | Possible responses |
|--------------------------------|-----------------------------------|
| AT+CGMI | Centel Modem |
| Get manufacture identification | OK Command valid, Centel modem |

4.1.3 Defined values :

No parameter

4.2 Request model identification +CGMM

4.2.1 Description :

This command is used to get the supported frequency bands. With multi-band products the response may be a combination of different bands.

4.2.2 Syntax :

Command syntax : AT+CGMM

| Command | Possible responses |
|-----------------------------|---------------------|
| AT+CGMM | MULTIBAND 900E 1800 |
| Note : Get HARDWARE version | OK |

4.2.3 Defined values :

No parameter

4.3 Request revision identification +CGMR

4.3.1 Description :

This command is used to get the revised software version.

4.3.2 Syntax :

Command syntax : AT+CGMR

| Command | Possible responses |
|-----------------------------|--|
| AT+CGMR | PIML DV11Z R01.23 Dec 17 2003 14:06:42 |
| Note : Get software version | OK |

4.3.3 Defined values :

No parameter

4.4 Product Serial Number +CGSN

4.4.1 Description :

This command allows the user application to get the IMEI (International Mobile Equipment Identity, 15 digits number) of the product.

4.4.2 Syntax :

Command syntax : AT+CGSN

| Command | Possible responses |
|---------------------|---------------------------------|
| AT+CGSN | 012345678901234 OK |
| Note : Get the IMEI | Note : IMEI read from EEPROM |
| AT+CGSN | +CME ERROR: 22 |
| Note : Get the IMEI | Note : IMEI not found in EEPROM |

4.4.3 Defined values :

No parameter

4.5 Select TE character set +CSCS

4.5.1 Description :

This command informs the ME which character set is used by the TE. The ME can convert each character of entered or displayed strings. This is used to send, read or write short messages. See also +WPCS for the phonebooks' character sets.

4.5.2 Syntax :

Command syntax : AT+CSCS=<Character Set>

| Command | Possible responses |
|--|--|
| AT+CSCS="GSM" Note : GSM default alphabet | OK Note : Command valid |
| AT+CSCS=? Note : Get possible values | +CSCS: ("IRA","GSM","UCS2","HEX") OK Note : Possible values |

4.5.3 Defined values :

<Character Set>

| | |
|--------|---|
| "GSM" | GSM default alphabet. |
| "HEX" | Hexadecimal mode. No character set used ; the user can read or write hexadecimal values |
| "IRA" | write hexadecimal values. |
| "UCS2" | UNICODE |

4.6 CENTEL Phonebook Character Set +WPCS

4.6.1 Description :

This specific command informs the ME which character set is used by the TE for the phonebooks. The ME can convert each character of entered or displayed strings. This is used to read or write phonebook entries. See also +CSCS for the short messages character sets.

4.6.2 Syntax :

Command syntax : AT+WPCS=<Character Set>

| Command | Possible responses |
|--|---|
| AT+WPCS="TRANSPARENT" Note : Transparent mode | OK Note : Command valid |
| AT+WPCS=? Note : Get possible values | +WPCS: ("TRANSPARENT","HEX") OK Note : Possible values |

4.6.3 Defined values :

<Character Set>

- "TRANSPARENT" Transparent mode. The strings are displayed and entered as they are stored in SIM or in ME.
- "HEX" Hexadecimal mode. No character set used ; the user can read or write hexadecimal values.

4.7 Request IMSI +CIMI

4.7.1 Description :

This command is used to read and identify the IMSI (International Mobile Subscriber Identity) of the SIM card. The PIN may need to be entered before reading the IMSI.

4.7.2 Syntax

Command syntax : AT+CIMI

| Command | Possible responses |
|--|--|
| AT+CIMI <i>Note : Read the IMSI</i> | 208200120320598 OK <i>Note : IMSI value (15 digits), starting with MCC (3 digits) / MNC (2 digits, 3 for PCS 1900)</i> |

See appendix 19.12 for MCC / MNC description.

4.7.3 Defined values :

No parameter

4.8 Card Identification +CCID

4.8.1 Description :

This command orders the product to read the EF-CCID file on the SIM card.

4.8.2 Syntax :

Command syntax : AT+CCID

| Command | Possible responses |
|---|--|
| AT+CCID Note : Get card ID | +CCID: "123456789AB111213141" Note : EF-CCID is present, hexadecimal format |
| AT+CCID? Note : Get current value | + CCID: "123456789AB111213141" Note : Same result as +CCID |
| AT+CCID= ? Note : Get possible value | OK Note : No parameter but this command is valid |

4.8.3 Defined values :

No parameter

If there is no EF-CCID file present on the SIM, the +CCID answer will not be sent, but the OK message will be returned

4.9 Capabilities list +GCAP

4.9.1 Description :

This command gets the complete list of capabilities.

4.9.2 Syntax :

Command syntax : AT+GCAP

| Command | Possible responses |
|--|--|
| AT+GCAP Note :Get capabilities list | +GCAP;+CGSM OK Note: Support GSM command |

4.9.3 Defined values :

No parameter

4.10 Repeat last command A/

4.10.1 Description :

This command repeats the previous command. Only the A/ command itself cannot be repeated.

4.10.2 Syntax :

Command syntax : A/

| Command | Possible responses |
|--------------------------------|--------------------|
| A/ Note Repeat last command | |

4.10.3 Defined values :

No parameter

4.11 Power off +CPOF

4.11.1 Description :

This specific command power off PIML

4.11.2 Syntax :

Command syntax : AT+CPOF

| Command | Possible responses |
|-----------------------------|---------------------|
| AT+CPOF Note : power off | Note: Command valid |

4.11.3 Defined values :

4.12 Set phone functionality +CFUN

4.12.1 Description :

This command selects the mobile station's level of functionality.

If the application wants to force the product to execute an IMSI DETACH procedure, then it must send:

AT+CFUN=0

This command closed RF and SIM card can be accessed, so, sending SM function can Not be used again.

The AT+CFUN=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.

If you write entries in the phonebook (+CPBW) and then reset the product directly (AT+CFUN=1, with no previous AT+CFUN=0 command), some entries may not be written (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 baud rate defined by the +IPR command. With the autobauding mode the response can be at a different baud rate, it is therefore preferable to save the defined baud rate with AT&W before directly sending the AT+CFUN=1 command.

4.12.2 Syntax :

Command syntax : AT+CFUN=<functionality level>

| Command | Possible responses |
|--|---|
| AT+CFUN? Note : Ask for current functionality level | +CFUN: 1 OK Note : Full functionality |
| AT+CFUN=0 Note : Set minimum functionality, | OK Note : Command valid SIM is valid |
| AT+CFUN=1 Note : Set the full functionality mode with a complete software reset | OK Note : Command valid |

4.12.3 Defined values :

<functionality level>

0 : Set minimum functionality, IMSI detach procedure

1 : Set the full functionality mode with a complete software reset

4.13 Phone activity status +CPAS

4.13.1 Description :

This command returns the activity status of the mobile equipment.

4.13.2 Syntax :

Command syntax : AT+CPAS

| Command | Possible responses |
|--|--------------------|
| AT+CPAS <i>Note : Current activity status</i> | +CPAS: <pas> OK |

4.13.3 Defined values :

<pas>

- 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)

4.14 Report Mobile Equipment errors +CMEE

4.14.1 Description :

This command disables or enables the use of the "+CME ERROR : <xxx>" or "+CMS ERROR :<xxx>" result code instead of simply "ERROR". See appendix 19.1 for +CME ERROR result codes description and appendix 19.2 for +CMS ERROR result codes.

4.14.2 Syntax :

Command syntax : AT+CMEE=<error reporting flag>

| Command | Possible responses |
|---|--------------------|
| AT+CMEE=0 Note : Disable ME error reports, use only « ERROR » | OK |
| AT+CMEE=1 Note : Enable «+CME ERROR:<xxx>» or «+CMS ERROR:<xxx>» | OK |

4.14.3 Defined values :

<error reporting flag>

0 : Disable ME error reports, use only « ERROR »

1 : Enable «+CME ERROR: <xxx>» or «+CMS ERROR: <xxx>»

4.15 Keypad control +CKPD

4.15.1 Description :

This command emulates the ME keypad by sending each keystroke as a character in a <keys> string. The supported GSM sequences are listed in the appendix. If emulation fails, a +CME ERROR: <err> is returned. If emulation succeeds, the result depends on the GSM sequence activated:

Note: In the case where the FDN phonebook is activated, the sequences concerning "call forwarding" are allowed only if the entire sequence is written in the FDN.

4.15.2 Syntax :

Command syntax : AT+CKPD=<keys>

| Command | Possible responses |
|--|--------------------|
| AT+CKPD="*#21#" Note : Check every call forwarding status | +CCFC: 0,7 |
| AT+CKPD="1234" Note : Sequence not allowed | +CME ERROR 3 |

4.15.3 Defined values :

<keys>

Keyboard sequence : string of the following characters (0-9,*,#).

4.16 Clock Management +CCLK

4.16.1 Description :

This command is used to set or get the current date and time of the ME real-time clock.

4.16.2 Syntax :

Command syntax : AT+CCLK=<date and time string>

| Command | Possible responses |
|---|---|
| AT+CCLK="00/06/09,17:33:00" Note : set date to June 9 th , 2000, and time to 5:33pm | OK Note : Date/Time stored |
| AT+CCLK="00/13/13,12:00:00" Note : Incorrect month entered | +CME ERROR 3 |
| AT+CCLK? Note : Get current date and time | +CCLK: "00/06/09,17:34:00" OK Note : current date is June 9 th , 2000 current time is 5:34:00 pm |

4.16.3 Defined values :

<date and time string>

String format for date/time is: "yy/MM/dd,hh:mm:ss".

Valid years are 98 (for 1998) to 97 (for 2097). The seconds field is not mandatory.

Default date/time is "98/01/01,00:00:00" (January 1st, 1998 / midnight).

On PIML, we did not support second setting.

4.17 Alarm Management +CALA

4.17.1 Description :

This command is used to set alarms date/time in the ME. The maximum number of alarms is 1.

4.17.2 Syntax :

Command syntax : AT+CALA=<date and time string> (set alarm)
AT+CALA="",<index> (delete alarm)

| Command | Possible responses |
|---|--|
| AT+CALA="00/06/09,07:30" Note : set an alarm for June 9 th , 2000 at 7:30 am | OK Note : Alarm stored |
| AT+CALA="99/03/05,13:00:00" Note : set an alarm for March 5 th , 1999 at 1:00 pm | +CME ERROR 3 Note : Invalid alarm (date/time expired) |
| AT+CALA? Note : list all alarms | +CALA: "00/06/08,15:25:00",1 |
| | +CALA: "00/06/08,15:25:00",1 Note : an alarm occurs (index 1) |
| AT+CALA="",1 Note : delete this alarm. | OK Note : Alarm is deleted |
| AT+CALA? Note : list all alarms | +CALA: "00/06/09,07:30:00",2 Note : Only one alarm (index 2) |

4.17.3 Defined values :

<date and time string>
String format for alarms : "yy/MM/dd, hh:mm:ss" (see +CCLK).
Note : Seconds are not taken into account.

<index>
offset in the alarm list.

4.18 Select type of address +CSTA

4.18.1 Description :

This command is used to select type of address.

4.18.2 Syntax :

Command syntax : AT+CSTA=<type>

| Command | Possible responses |
|-----------------------|------------------------------------|
| AT+CSTA? Note : | +CSTA: 129 OK Note : |
| AT+CSTA=? Note : | +CSTA: (129,145) OK Note : l |
| AT+CSTA=129 Note : | OK Note : |
| AT+CSTA Note : | +CME ERROR: 3 Note : |

4.18.3 Defined values :

4.19 Call mode +CMOD

4.19.1 Description :

This command is used to set call mode.

4.19.2 Syntax :

Command syntax :

| Command | Possible responses |
|-------------------------|-------------------------|
| AT+CMOD? Note : | +CMOD: 0 Note : |
| AT+ CMOD =? Note : | +CMOD: (0) Note : |
| AT+ CMOD =< > Note : | Note : |
| AT+ CMOD Note : | +CME ERROR: 3 Note : |

4.19.3 Defined values :

4.20 Hangup call +CHUP

4.20.1 Description :

This command is used to hangup call.

4.20.2 Syntax :

Command syntax :AT+CHUP

| Command | Possible responses |
|-----------------------|-----------------------------|
| AT+ CHUP? Note : | +CME ERROR: 3 Note : |
| AT+ CHUP =? Note : | +CME ERROR: 3 Note : |
| AT+ CHUP Note : | OK Note :Disconnect call |

4.20.3 Defined values :

4.21 S Command

4.21.1 Description :

This command is used to set some value to register.

4.21.2 Syntax :

Command syntax :ATS<n>

| Command | Possible responses |
|---|--|
| ATS0? Note :Read the current auto answer value | 009 OK |
| ATS0 =? Note :Get possible vaule | +CME ERROR: 3 Note : The product can not support this command |
| ATS0 =10 Note :Set auto answer value | OK Note :The operation successes. |
| ATS0? Note : | 010 OK Note :Get the value we just set. |

4.21.3 Defined values :

(n)

- 0: Auto answer value
- 1: Ring counter
- 2: Terminal character
- 3: Command line termination character
- 4: Response formating character
- 5: Command line editing character
- 7: Connection completion timeout
- 8: Coma dial modifier time
- 9: Automatic disconnect delay

4.22 Manufacturer identification +CGMI

4.22.1 Description :

This command gives the manufacturer identification.

4.22.2 Syntax :

Command syntax : AT+CGMI

| Command | Possible responses |
|--------------------------------|-----------------------------------|
| AT+CGMI | Centel Modem |
| Get manufacture identification | OK Command valid, Centel modem |

4.22.3 Defined values :

No parameter

4.23 Request model identification +CGMM

4.23.1 Description :

This command is used to get the supported frequency bands. With multi-band products the response may be a combination of different bands.

4.23.2 Syntax :

Command syntax : AT+CGMM

| Command | Possible responses |
|-----------------------------|---------------------|
| AT+CGMM | MULTIBAND 900E 1800 |
| Note : Get HARDWARE version | OK |

4.23.3 Defined values :

No parameter

4.24 Request revision identification +CGMR

4.24.1 Description :

This command is used to get the revised software version.

4.24.2 Syntax :

Command syntax : AT+CGMR

| Command | Possible responses |
|-----------------------------|--|
| AT+CGMR | PIML DV11Z R01.23 Dec 17 2003 14:06:42 |
| Note : Get software version | OK |

4.24.3 Defined values :

No parameter

5 Call Control commands**5.1 Dial command D****5.1.1 Description :**

The ATD command is used to **set a voice, data call**, As per GSM 02.30, the dial command also controls supplementary services.

For a data or a fax call, the application sends the following ASCII string to the product (the bearer must be previously selected with the +CBST command):

ATD<nb> where <nb> is the destination phone number.

For a voice call, the application sends the following ASCII string to the product: (the bearer may be selected previously, if not a default bearer is used).

ATD<nb>; where <nb> is the destination phone number.

Please note that for an **international number**, the local international prefix does not need to be set (usually 00) but does need to be replaced by the '+' character.

Example: to set up a voice call to CENTEL offices from another country, the AT command is: "**ATD+33146290800;**"

Note that some countries may have specific numbering rules for their GSM handset numbering.

The response to the ATD command is one of the following:

| Verbose result code | Numeric code (with ATV0 set) | Description |
|---------------------|------------------------------|---|
| OK | 0 | if the call succeeds, for voice call only |
| CONNECT <speed> | 10,11,12,13,14, 15 | if the call succeeds, for data calls only, <speed> takes the value negotiated by the product. |
| BUSY | 7 | If the called party is already in communication |
| NO ANSWER | 8 | If no hang up is detected after a fixed network time-out |

| | | |
|------------|---|---|
| NO CARRIER | 3 | Call setup failed or remote user release. Use the AT+CEER command to know the failure cause |
|------------|---|---|

Direct dialling from a phonebook (stored in the SIM card) can be performed with the following command:

ATD> <index>; to call <index> from the selected phonebook (by the +CPBS command) **ATD> "BILL"**; to call "BILL" from the selected phonebook

5.1.2 Syntax :

Command syntax : ATD<nb><I>[:]
ATD><index><I>[:]

| Command | Possible responses |
|--|--|
| AT+CPBS? Note : Which phonebook is selected ? | +CPBS:"SM",8,10 Note : ADN phonebook is selected, 8 locations are used and 10 locations are available |

5.1.3 Defined values :

<nb>

destination phone number

<index>

call number at indicated offset from the phonebook selected by the +CPBS command

<name>

call number corresponding to given name from the phonebook selected by the +CPBS command

5.2 Hang-Up command H

5.2.1 Description :

The ATH command is used by the application to disconnect the remote user. In the case of multiple calls, all calls are released (active, on-hold and waiting calls).

The specific CENTEL ATH1 command has been appended to disconnect the current outgoing call, only in dialing or alerting state (ie. 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.

5.2.2 Syntax :

Command syntax : ATH<n>

| Command | Possible responses |
|-------------------------------------|---|
| ATH Note : Ask for disconnection | OK Note : Every call, if any, are released |

| | |
|--|---|
| ATH1 Note : Ask for outgoing call disconnection | OK Note : Outgoing call, if any, is released |
|--|---|

5.2.3 Defined values :

<n>

0 : Ask for disconnection (default value)

1 : Ask for outgoing call disconnection

5.3 Answer a call A

5.3.1 Description :

When the product receives a call, it sets the **RingInd** 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.

5.3.2 Syntax :

Command syntax : ATA

| Command | Possible responses |
|--|--------------------------------|
| | RING Note : Incoming call |
| ATA Note : Answer to this incoming call | OK Note : Call accepted |
| ATH Note : Disconnect call | OK Note : Call disconnected |

5.3.3 Defined values :

No parameter

5.4 Remote disconnection

This message is used by the product to inform the application that an active call has been released by the remote user.

The product sends "**NO CARRIER**" to the application and sets the DCD signal. In addition, for AOC, the product can release the call if credit has expired (release cause 68 with +CEER command).

5.5 Extended error report +CEER

5.5.1 Description :

This command gives the cause of call release when the last call set up (originating or answering) failed.

5.5.2 Syntax :

Command syntax : AT+CEER

| Command | Possible responses |
|---|--|
| ATD123456789; Note : Outgoing voice call | NO CARRIER Note : Call setup failure |
| AT+CEER Note : Ask for reason of release | +CEER : Error <xxx> OK Note : <xxx>is the cause information element values from GSM recommendation 04.08 or specific Call accepted |

For the cause information element from GSM 04.08 see chapter 18.4 or 18.5. "NO CARRIER" indicates that the AT+CEER information is available for failure diagnosis.

5.5.3 Defined values :

No parameter

5.6 DTMF signals +VTD, +VTS

5.6.1 +VTD Description :

The product enables the user application to send DTMF tones over the GSM network. This command is used to define tone duration (the default value is 300ms).

5.6.2 +VTD Syntax :

Command syntax : AT+VTD=<n>

| Command | Possible responses |
|---|----------------------------|
| AT+VTD=6 Note : To define 600 ms tone duration | OK Note : Command valid |
| AT+VTD=0 Note : To set the default value | OK |
| AT+VTD? Note : interrogate current tone duration | +VTD : <n> OK |
| AT+VTD=? | +VTD : (0-255) OK |

5.6.3 Defined values :

<n> : tone duration

<n>*100 is the duration in ms.

If $n < 4$, tone duration is 300 ms; if $n > 255$, the value is used modulo 256.

Default value is 300 ms, that is $\langle n \rangle = 3$.

5.6.4 +VTS Description :

The product enables the user application to send DTMF tones over the GSM network. This command enables tones to be transmitted, only when there is an active call.

5.6.5 +VTS Syntax :

Command syntax : AT+VTS=<Tone>

| Command | Possible responses |
|-----------|--|
| AT+VTS=A | OK Note : Command valid |
| AT+VTS=11 | +CME ERROR: 4 Note : If the <Tone> is wrong |
| AT+VTS=4 | +CME ERROR: 3 Note : If there is no communication |

Note:

PIML: Contain +WDTMF function in this command

5.6.6 Defined values :

<Tone> : DTMF tone to transmit <Tone>
is in {0-9,*,#,A,B,C,D}

5.7 Redial last telephone number ATDL**5.7.1 Description :**

This command is used by the application to redial the last number used in the ATD command.
The last number dialled is displayed followed by “;” for voice calls only

5.7.2 Syntax :

Command syntax : ATDL

| Command | Possible responses |
|--|--|
| ATDL <i>Note : Redial last number</i> | 0146290800; OK <i>Note : Last call was a voice call. Command valid</i> |

5.7.3 Defined values :

No parameter

5.9 Automatic answer ATSO

5.9.1 Description :

This S0 parameter determines and controls the product automatic answering mode.

5.9.2 Syntax :

Command syntax : ATSO=<value>

| Command | Possible responses |
|---|---|
| ATSO=2 Note : Automatic answer after 2 rings | OK |
| ATSO? Note : Current value | 002 OK Note : always 3 characters padded with zeros |
| ATSO=0 Note : No automatic answer | OK Note : Command valid |

All others S-parameters (S6,S7,S8 ...) are not implemented.

5.9.3 Defined values :

<value>

number of rings before automatic answer (3 characters padded with zeros).

Range of values is 0 to 255.

5.10 Incoming Call Bearer +CICB

5.10.1 Description :

This specific command is used to set the type of incoming calls when no incoming bearer is given (see +CSNS).

Note:

setting the +CICB command affects the current value of +CSNS.

5.10.2 Syntax :

Command syntax : AT+CICB=<mode>

| Command | Possible responses |
|---|--|
| AT+CICB=1 Note : If no incoming bearer, force a fax call | OK Note : Command accepted |
| AT+CICB=2 Note : If no incoming bearer, force a voice call | OK Note : Command accepted |
| AT+CICB? Note : Interrogate value | +CICB: 2 OK Note : Default incoming bearer: voice call |
| AT+CICB=? Note : Test command | +CICB: (0-2) OK Note : Speech, data or fax default incoming bearer |

5.10.3 Defined values :

<mode>

0 : Data

1 : Fax

2 : Speech

5.11 Single Numbering Scheme +CSNS

5.11.1 Description :

This command selects the bearer to be used when an MT single numbering scheme call is set up (see +CICB).

Note:

setting the +CSNS command affects the current value of +CICB.

5.11.2 Syntax :

Command syntax : AT+CSNS

| Command | Possible responses |
|--|--|
| AT+CSNS=0 Note : force a voice call | OK Note : Command accepted |
| AT+CSNS? Note : Interrogate value | +CSNS: 0 OK Note : Default incoming bearer: voice call |
| AT+CSNS=? Note : Test command | +CSNS: (0,2,4) OK Note : Voice, data default incoming bearer |

5.11.3 Defined values :

<mode>

0 : Voice

4 : Data

5.12 Gain control +VGR, +VGT

5.12.1 Description :

This command is used by the application to tune the receive gain of the speaker and the transmit gain of the microphone.

5.12.2 Syntax :

Command syntax : AT+VGR=<Rgain>
AT+VGT=<Tgain>

| Command | Possible responses |
|-------------------------------------|--|
| AT+VGR=25 | OK Note : Command valid |
| AT+VGT=45 | OK Note : Command valid |
| AT+VGR? Note : Interrogate value | +VGR: 64 OK Note : Default receive gain |
| AT+VGR=? Note : Test command | +VGR : (0-255) OK Note : Possible values |
| AT+VGT? Note : Interrogate value | +VGT: 64 OK Note : Default transmit gain |
| AT+VGT=? Note : Test command | +VGT : (0-255) OK Note : Possible values |

Note : For the AT+VGT ? command with controller 1 set, the value is the lower value of range, where as with controller 2, value correspond to the entered value with AT+VGT=xx.

5.12.3 Defined values :

<Rgain> : reception gain

<Tgain> : transmission gain

The application sends:

| For receive gain | AT+VGR=<val> | For transmit gain | AT+VGT=<val> |
|------------------|--------------|-------------------|--------------|
| +5.88dB | 0-30 | 0 | |
| | | 1 | -24.08 |
| +3.15dB | 31-55 | 2 | -18.06 |
| +0 dB | 56-80 | 3 | -14.54 |
| -3.25dB | 81-105 | 4 | -12.04 |
| -6.02dB | 106-130 | 5 | -10.1 |
| -9.28dB | 131-155 | 6 | -8.52 |
| -12.04dB | 156-180 | 7 | -7.18 |
| -14.54dB | 181-205 | 8 | -6.02 |
| -18.06dB | 206-230 | 9 | -5 |
| -20.56dB | 231-255 | 10 | -4.08 |
| | | 11 | -3.26 |
| | | 12 | -2.5 |
| | | 13 | -1.8 |
| | | 14 | -1.16 |
| | | 15 | -0.56 |
| | | 16 | 0 |
| | | 17 | 0.53 |
| | | 18 | 1.02 |
| | | 19 | 1.49 |
| | | 20 | 1.94 |
| | | 21 | 2.36 |
| | | 22 | 2.77 |
| | | 23 | 3.15 |
| | | 24 | 3.52 |
| | | 25 | 3.88 |
| | | 26 | 4.22 |
| | | 27 | 4.54 |
| | | 28 | 4.86 |
| | | 29 | 5.16 |
| | | 30 | 5.46 |
| | | 31 | 5.74 |
| | | 32 | 6.02 |
| | | 33 | 6.29 |
| | | 34 | 6.55 |
| | | 35 | 6.8 |
| | | 36 | 7.04 |
| | | 37 | 7.28 |
| | | 38 | 7.51 |
| | | 39 | 7.74 |
| | | 40 | 7.96 |
| | | 41 | 8.17 |
| | | 42 | 8.38 |

| | | | |
|--|--|----|-------|
| | | 43 | 8.59 |
| | | 44 | 8.79 |
| | | 45 | 8.98 |
| | | 46 | 9.17 |
| | | 47 | 9.36 |
| | | 48 | 9.54 |
| | | 49 | 9.72 |
| | | 50 | 9.9 |
| | | 51 | 10.07 |
| | | 52 | 10.24 |
| | | 53 | 10.4 |
| | | 54 | 10.56 |
| | | 55 | 10.72 |
| | | 56 | 10.88 |
| | | 57 | 11.03 |
| | | 58 | 11.19 |
| | | 59 | 11.33 |
| | | 60 | 11.48 |
| | | 61 | 11.62 |
| | | 62 | 11.76 |
| | | 63 | 11.9 |

The gain values listed here are relative, for absolute (electrical) values please refer to the specific hardware documentation of the module used in the application.

5.13 Microphone Mute Control +CMUT

5.13.1 Description :

This command is used to mute the microphone input on the product (for the active microphone set with the +SPEAKER command). This command is only allowed during a call.

5.13.2 Syntax :

Command syntax : AT+CMUT=<mode>

| Command | Possible responses |
|--|--|
| AT+CMUT=? Note : Test command | +CMUT : (0,1) OK Note : Enable / disable mute |
| AT+CMUT? Note : Ask for current value | +CMUT : 0 OK Note : Current value is OFF |
| AT+CMUT=1 Note : Mute ON (call active) | OK Note : Command valid |
| AT+CMUT? Note : Ask for current value | +CMUT : 1 OK Note : Mute is active (call active) |
| AT+CMUT=0 Note : Mute OFF (call not active) | +CME ERROR:3 Note : Command not valid |

5.13.3 Defined values :

<mode>

0 : microphone mute off (default value).

1 : microphone mute on.

5.14 Speaker & Microphone selection +SPEAKER

5.14.1 Description:

This specific command is used to select the speaker and the microphone set.

5.14.2 Syntax :

Command syntax : AT+SPEAKER=<ActiveSpkMic>

| Command | Possible responses |
|--|--|
| AT+SPEAKER=0 Note : Speaker ONE and Micro ONE | OK Note : Command valid |
| AT+SPEAKER? | +SPEAKER: 0 OK Note : Speaker ONE and Micro ONE are active |
| AT+SPEAKER=? | +SPEAKER: (0,1) OK |
| AT+CMUT? Note : Ask for current value | +CMUT : 1 OK Note : Mute is active (call active) |
| AT+CMUT=0 Note : Mute OFF (call not active) | +CME ERROR:3 Note : Command not valid |

5.14.3 Defined values :

5.14.3 Defined values :

<ActiveSpkMic>

0 : SPEAKER ONE, MICRO ONE

1 : SPEAKER TWO, MICRO TWO

5.15 Echo Cancellation +ECHO

5.15.1 Description :

This specific command is used to enable, disable or configure the Echo Cancellation functions for voice calls (in rooms, in cars, etc.). It is necessary to tune the Microphone gain (AT+VGT) and the Speaker gain (AT+VGR) before activating the Echo Cancellation.

5.15.2 Syntax :

Command syntax :

AT+ECHO=<GammaSp>,<GammaNSp>,<AlfaRev>

| Command | Possible responses |
|---|---|
| AT+CMEE=1 Note: Enables the use of result code | OK |
| AT+SPEAKER? | + SPEAKER: 0 OK Note : Speaker ONE and Micro ONE are active |
| AT+SIDET=0 Note: Deactivate the Sidetone | OK |
| AT+SIDET? | +SIDET: 0,0 |
| AT+ECHO? Note : Read current settings | +ECHO: 0,2,0 OK |
| AT+ECHO=96,2,95 Note : Active Echo cancellation for Mic/Spk one. | OK |
| AT+ECHO? Note : Read current settings | +ECHO: 96,2,95 OK |

5.15.3 Defined values:

<GammaSp>

Remote echo cancellation
The allowed range is [1; 96].
16 by default

<GammaNSp>

Near echo cancellation
The allowed range is [1; 96].
96 by default

<AlfaRev>

Echo cancellation related to room
The allowed range is [1; 64].
64 by default

5.16 SideTone modification +SIDET

5.16.1 Description :

This specific command is used to set the level of audio feedback in the speaker (microphone feedback in the speaker).

5.16.2 Syntax :

Command syntax : AT+SIDET=<val1>[,<val2>]

Command Possible responses

AT+SIDET=1,0

OK

Note : Command valid

AT+SIDET?

Note : Current value

+SIDET: 1,0

OK

Note : Command valid

AT+SIDET=? +SIDET: (0-1),(0-3)

OK

5.16.3 Defined values :

<val1>

0: SideTone is disabled

1: SideTone is enabled

<val2> (default value 0 will be used if this parameter is not given)

0: 0 db

1: - 6 db

2: - 12 db

3: - 18 db

5.17 Initialize Voice Parameters +VIP

5.17.1 Description :

This command allows factory settings for voice parameters to be restored from EEPROM.

These voice parameters include:

- Gain control (+VGR & +VGT commands),
- Microphone mute control (+CMUT command),
- Speaker & Microphone selection (+SPEAKER command),
- Echo cancellation (+ECHO command),
- Side tone modification (+SIDET command).

5.17.2 Syntax :

Command syntax : AT+VIP=<n>

| Command | Possible responses |
|--|--|
| AT+VIP? | +VIP: 1 OK |
| AT+VIP=2 Note : Syntax error | +CME ERROR: 3 |
| AT+VIP=1 Note : Restore the factory settings from EEPROM | OK Note : The command has been executed |
| AT+VIP=1 Note : Restore the factory settings from EEPROM with the current Echo cancellation algo (different of the default algo). | CME ERROR: 519 Note : Reset the product to accept the new algo. |
| AT+VIP=? Note : List of supported <n>s | +VIP: (1) OK |

5.17.3 Defined values :

<n>

1 : Restore all voice parameters
Other values are not supported.

5.18 Ring Melody Playback +CRMP

5.18.1 Description

This command allows a melody to be played. All melodies are manufacturer defined.

For incoming voice, data or fax calls, 10 manufacturer-defined melodies can be played back (in a loop).

Note:

loop melodies (for voice/data/fax call) must be stopped by a +CRMP command with the <index> field set to 0 (example: +CRMP=0,,0).

When the <volume> parameter is given, this overwrites the <sound level> value of the +CRSL command. If the <volume> parameter is not given, the <sound level> value of +CRSL is used as default value.

5.18.2 Syntax :

Command syntax : AT+CRMP=<call type>[,<volume>,<type>,<index>]

| Command | Possible responses |
|---|-------------------------------------|
| AT+CRMP=0,7,0,2 Note : Play voice call melody index 2 with volume level 7. | OK Note : Melody Playback. |
| AT+CRMP=0,,0 Note : Stop the melody. | OK Note : The melody is stopped. |

| | |
|--|------------------------------------|
| AT+CRMP=? Note : supported parameters | +CRMP: (0-2),(0-15),0,(0-10) OK |
|--|------------------------------------|

5.18.3 Defined values :

<call type>
0 Incoming voice call
1 Incoming data call
2 Incoming fax call
<volume>
0 Min volume
...
6 Default volume
15 Max volume
<type>
0 Manufacturer Defined (default)
<index>
0 Stop Melody Playback
1-10 Melody ID for voice/data/fax call type (default : 1)

5.19 Ringer Sound Level +CRSL**5.19.1 Description :**

This command is used to set/get the sound level of the ringer on incoming calls. The set command changes the default <volume> value of the +CRMP command.

5.19.2 Syntax :

Command syntax : AT+CRSL=<sound level>

| Command | Possible responses |
|--|---|
| AT+CRSL=0 Note : Set volume to Min. | OK Note : Current ring playing with Min. volume. |
| AT+CRSL=15 Note : Set volume to Max. | OK Note : Current ring playing with Max. volume. |
| AT+CRSL=? Note : supported parameters | +CRSL: (0-15) OK |

5.19.3 Defined values :

<sound level>
0 Min volume
6 Default volume (default)
15 Max volume

6 Network service commands

6.1 Signal Quality +CSQ

6.1.1 Description :

This command is used to ascertain the received signal strength indication (<rssI>) and the channel bit error rate (<ber>) with or without a SIM card inserted.

6.1.2 Syntax :

Command syntax : AT+CSQ

| Command | Possible responses |
|---------|---|
| AT+CSQ | +CSQ: <rssI>,<ber> OK <i>Note : <rssI> and <ber> as defined below</i> |

6.1.3 Defined values :

<rssI> :

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> : 0...7: as RXQUAL values in the table GSM 05.08

99: not known or not detectable

Notes: <ber> is not valid and only response "99"

6.2 Operator selection +COPS

6.2.1 Description :

There are three possible ways of selecting an operator (PLMN):

- 1) The product is in **manual** mode. It then tries to find the operator specified by the application and if found, tries to register.
- 2) 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.
- 3) 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 the currently selected operator. In manual mode, this PLMN may not be the one set by the application (as it is in the search phase). These commands are not allowed during one communication.

6.2.2 Syntax :

To force an attempt to select and register on a network, the application must send the following command:

Command syntax: AT+COPS=<mode>, [<format> [, <oper>]]

Possible responses for AT+COPS=<mode>:

- OK (Network is selected with full service)
- +CME ERROR: 30 (No network service),
- +CME ERROR: 32 (Network not allowed – emergency calls only)
- +CME ERROR: 3 (not allowed during one Communication)
- +CME ERROR: 4 (Incorrect parameters)

Response syntax for AT+COPS?:

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

Response syntax for AT+COPS=?:

+COPS: [list of supported (<stat>, long alphanumeric <oper>, short alphanumeric <oper>s, numeric <oper>) s]

If an incoming call occurs during a PLMN list request, the operation is aborted

(+CME ERROR: 520) and the unsolicited RING appears

| Command | Possible responses |
|---|---|
| AT+COPS? Note : Ask for current PLMN | +COPS: 0,2,20801 OK Note : Home PLMN is France Telecom Orange |
| AT+COPS=? Note : Ask for PLMN list | +COPS: (2,"F Itin éris","Itline","20801"), (3,"F SFR","SFR","20810") OK Note : Home PLMN is France Telecom SFR network has 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=1,1,23433 Note : Ask for registration on UK Orange network | +CME ERROR: 529 Note : Selection failed – emergency calls only |
| AT+COPS=0 Note : Ask for registration on home network | OK Note : Succeeded |
| AT+COPS=3,0 Note : Set <format> to long alphanumeric | OK |
| AT+COPS? Note : Ask for current PLMN | +COPS: 0,0,"Orange F" OK Note : Home PLMN is France Telecom Orange |
| AT+COPS=2 Note : Ask for deregistration from network | OK Note : Succeeded |
| AT+COPS? Note : Ask for current PLMN | +COPS: 2 Note : ME is unregistered until <mode>=0 or 1 is selected |

6.2.3 Defined values :

The parameters values are the following ones:

<mode>

0: automatic (default value)

1: manual

2: deregistration ; ME 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 value)

<stat>: status of <oper>

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 (see appendix 19.12 for operator names description, field is "Name")

The short alphanumeric format can be up to 8 characters long.

6.3 Network registration +CREG

6.3.1 Description

This command is used by the application to ascertain the registration status of the product.

6.3.2 Syntax :

Command syntax : AT+CREG= <mode>

Response syntax : +CREG : <mode>, <stat> [,<lac>,<ci>] for AT+CREG? Command only

| Command | Possible responses |
|--|--|
| AT+CREG? | +CREG: <mode>,<stat> OK Note : As defined here-above |
| AT+CREG=0 Note : Disable network registration unsolicited result code | OK Note : Command valid |
| AT+CREG=1 Note : Enable network registration unsolicited result code | OK Note : Command valid |
| AT+CREG=2 Note : Enable network registration and location information unsolicited result code | OK Note : Command valid |
| AT+CREG=? | +CREG: (0-2) Note : 0,1,2 <mode> values are supported |

6.3.3 Defined values :**<mode>**

- 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>

- 0: not registered, ME is not currently searching for a new operator.
- 1: registered, home network.
- 2: not registered, ME currently searching for a new operator to register to.
- 3: registration denied.
- 4: unknown.
- 5: registered, roaming.

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).

<ci>: string type; two byte cell ID in hexadecimal format.

6.5 Selection of Preferred PLMN list +CPLS**6.5.1 Description :**

This command is used to select one PLMN selector with access technology list in the SIM card that is used by AT+CPOL command.

6.5.2 Syntax :

Command syntax: AT+CPLS= <List>

| Command | Possible responses |
|---------|--------------------|
|---------|--------------------|

| | |
|--|---|
| AT+CPLS? Note : Ask for selection of the SIM file | +CPLS: 1 OK Note :EF_OPLMNwAct is selected |
| AT+CPLS=0 Note : selection of EF_PLMNwAct | Note : if EF_PLMNwAct is not present, EF_PLMNsel will be selected |
| AT+CPLS=1 Note : selection of EF_OPLMNwAct | +CME ERROR: 3 Note : EF_OPLMNwAct is not present |
| AT+CPLS=? Note : Get possible values | +CPLS: (0,1,2) OK Note : The 3 files with Acces technology are present and can be selected |
| AT+CPLS=? Note : Get possible values | +CPLS: (0) OK Note : Only EF_PLMNwAct or EF_PLMNsel can be selected |

6.5.3 Defined values :

<List>:

- 0: User controlled PLMN selector with access technology EF_PLMNwAct
Note: if this file is not found EF_PLMNsel will be selected
- 1: Operator controlled PLMN selector with access technology EF_OPLMNwAct
- 2: Home PLMN selector with access technology EF_HPLMNwAct

6.6 Preferred operator list +CPOL

6.6.1 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 command AT+CPLS.

6.6.2 Syntax :

Command syntax : AT+CPOL=

[<index>] [,<format>[,<oper>[,<GSM_Act>,<GSMcomp_Act>,<Utran_Act>]]]

The different possibilities are:

- AT+CPOL = <index> to delete an entry.
- AT+CPOL = , <format> to set the format used by the read command (AT+CPOL?).
- AT+CPOL = , <format> , <oper> to put <oper> in the next free location.
- AT+CPOL = <index> , <format> , <oper> to write <oper> in the <format> at the <index>.
- AT+CPOL = <index> , <format> , <oper> , <GSM_Act> , <GSMcp_Act> , <Utran_Act> to write <oper> in the <format> at the <index> precising the acces technology (in the case of EF_PLMNwact, EF_HPLMNwact or EF_OPLMNwact is present). Note: per default if Acces technology parameters are not given, the GSM access technology will be choosen.

The supported format are those of the +COPS command.

The length of this list is limited to 85 entries for EF_PLMNsel, and 51 for EF_PLMNwAct, EF_OPLMNwAct, EF_HPLMNwAct.

| Command | Possible 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 acces technology selected GSM compact acces technology not selected Utran acces technology not selected |
| AT+CPOL=,0 Note : Select long alphanumeric format | OK |

| Command | Possible responses |
|--|--|
| AT+CPOL? Note : Ask for preferred list of networks With | +CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" OK Note : Preferred list of networks in long |

| | |
|---|--|
| only EF_PLMNsel present | alphanumeric format |
| AT +CPOL=7 , 2 , 2 0801 Note : Add a network to the list | OK |
| AT+CP O L? Note : Ask for preferred list of networks With only EF_PLMNsel present | +CPOL: 1, 0,"D 1-TEL E KOM" +CPOL: 6, 0,"F SF R" +CPOL: 7, 0," O range F" OK Note : Preferred list of networks in long alphanumeric format |
| AT+CP O L = 7 Note : Delete 7 th location | OK |
| AT+CP O L? Note : Ask for preferred list of networks With only EF_PLMNsel present | +CPOL: 1, 0,"D 1-TEL E KOM" +CPOL: 6, 0,"F SF R" OK Note : Preferred list of networks in long alphanumeric format |
| AT +CPOL=8 , 2 , 7 7777 Note : Add a new network to the list With only EF_PLMNsel present | OK |
| AT +CPOL=8 , 2 , 7 7777 ,0 ,0 ,1 Note : Add a new network to the list With EF_PLMNwact present | OK Note: Acces technology UTRAN is selected |
| AT +CPOL=8 , 2 , 7 7777 Note : Add a new network to the list With EF_PLMNwact present | OK Note: Per default Acces technology GSM is selected |
| AT+CP O L? Note : Ask for preferred list of networks With only EF_PLMNsel present | +CPOL: 1, 0,"D 1-TEL E KOM" +CPOL: 6, 0,"F SF R" +CPOL: 8 , 2 , 77 777 " OK Note : Preferred list of networks in long alphanumeric format but 8 th entry is unknown so the product edits it in the numeric format |
| AT+CP O L = 9,0, "Ora nge F" Note : Add a new network to the list (text format) | |
| AT+CP O L? Note : Ask for preferred list of networks With only EF_PLMNsel present | +CPOL: 1, 0,"D 1-TEL E KOM" +CPOL: 6, 0,"F SF R" +CPOL: 8 , 2 , 77 777 " +CPOL: 9, 0," O range F" OK Note : Preferred list of networks in long alphanumeric format |
| AT+CP O L = ? | +CPOL: (1-16),(0-2) OK Note : The EF can accept 16 records, and supported format are 0,1 or 2. |

6.6.3 Defined values :

<index> : position of the operator record in the sim preferred operator list. Do

AT+CPOL=? to get the maximum index of the selected EF.

<format> :

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0 long alphanumeric format for <oper>

1 short alphanumeric format for <oper>

2 numeric format for <oper>

<oper> : characterstring or integer (see <format>) indicating operator identifier.

<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

6.7 Read operator name +COPN

6.7.1 Description :

This command return the list of all operator names (in numeric and alphanumeric format) stored in the module.

6.7.2 Syntax :

Command syntax : AT+COPN

Command response : +COPN: <NumOper>,<AlphaOper>

| Command | Possible responses |
|--|--|
| AT+COPN Note : Ask for preferred list of networks | +COPN: 23201,"A1" +COPN: 23203,"A max." +COPN: 23207,"A tele.ring" +COPN: 23205,"one" ... OK +CME ERROR: <err> |
| AT+COPN=? | OK |

6.7.3 Defined values :

<NumOper> is the operator in numeric format.

<AlphaOper> is the operator in long alphanumeric format (see appendix 19.12 for operator names description)

7 Security commands

7.1 Enter PIN +CPIN

7.1.1 Description :

This command is used to enter the ME passwords (CHV1 / PUK1), that are required before any ME functionality can be used.

CHV1 is between **4** and **8** digits long, **PUK1** is **only 8 digits** long.

If the user application tries to make an outgoing call before the SIM PIN code (CHV1) has been confirmed, then the product will refuse the "ATD" command with a "+CME ERROR: 11" (SIM PIN required).

The application is responsible for checking the PIN after each reset or power on - if the PIN was enabled.

7.1.2 Syntax :

Command syntax: AT+CPIN=<pin>

| Command | Possible 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 |

After 3 unsuccessful attempts to enter the PIN (Personal Identification Number), the PUK (Personal Unblocking Key) 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. CHV1 is then **enabled** if PUK1 is correct. The application therefore uses this command: AT+CPIN=<Puk>,<NewPin>

| Command | Possible responses |
|--|--|
| 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, 2 nd attempt | OK Note : PUK correct, new PIN stored |

To ascertain which code must be entered (or not), the following query command can be used:

AT+CPIN?

The possible responses are :

| | |
|-------------------|-------------------------------------|
| +CPIN: READY | ME is not pending for any password |
| +CPIN: SIM PIN | CHV1 is required |
| +CPIN: SIM PUK | PUK1 is required |
| +CPIN: SIM PIN2 | CHV2 is required |
| +CPIN: SIM PUK2 | PUK2 is required |
| +CPIN: PH-SIM PIN | SIM lock (phone-to-SIM) is required |
| +CPIN: PH-NET PIN | Network personalisation is required |
| +CME ERROR: <err> | SIM failure (13) absent (10) etc... |

Please note that in this case the mobile equipment does not end its response with the OK string. 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 by a new one.

Example: 3 failed PIN validations + 1 successful PUK validation

| | |
|-----------------------|---|
| AT+CPIN? | Read the PIN status |
| +CPIN: SIM PIN | The product requires SIM PIN |
| AT+CPIN=1235 | First attempt to enter a SIM PIN |
| +CME ERROR: 16 | Wrong PIN |
| AT+CPIN=1236 | Second attempt |
| +CME ERROR: 16 | Wrong PIN |
| AT+CPIN=1237 | Third attempt |
| +CME ERROR: 16 | Wrong PIN |
| AT+CPIN? | Read PIN state |
| +CPIN: SIM PUK | The product requires PUK |
| AT+CPIN=99999999,5678 | The PUK is entered, the new PIN shall be 5678 |
| OK | PUK validation is OK. New Pin is 5678 |
| AT+CPIN? | Read PIN state |
| +CPIN: READY | The product is ready |

7.1.3 Defined values :

<pin> Personal Identification Number.

<puk> Personal Unblocking Key needed to change the PIN.
See above conditions of use.

7.3 PIN remaining attempt number +CPINC

7.3.1 Description :

This **specific** command is used to get the number of valid attempts for PIN1 (CHV1), PIN2 (CHV2), PUK1 (UNBLOCK CHV1) and PUK2 (UNBLOCK CHV2) identifiers.

7.3.2 Syntax :

Command syntax : AT+CPINC

Response syntax : +CPINC : <n1>,<n2>,<k1>,<k2>

| Command | Possible responses |
|--|---|
| AT+CPINC Note : Get the number of attempts left | +CPINC : 2,3,10,10 OK Note : First CHV1 attempt was a failure |
| AT+CPINC? Note : Get current values | +CPINC : 2,3,10,10 OK Note : First attempt was a failure |
| AT+CPINC=? Note : Get possible values | OK |

7.3.3 Defined values

<n1>, <n2> are the attempts left for PIN1, PIN2 (0 = blocked, 3 max)

<k1>, <k2> are the attempts left for PUK1, PUK2 (0 = blocked, 10 max)

For this to work, the card should be present at the time of initialization, otherwise an error will be sent (+CME ERROR : 10).

7.4 Facility lock +CLCK

7.4.1 Description :

This command is used by the application to lock, unlock or interrogate an ME or network facility <fac>.

Nota: Test SIM cards (with MCC=001 & MNC=01) doesn't check "PS", "PN", "PU", "PP" and "PC" locks.

7.4.2 Syntax :

Command syntax: AT+CLCK= <fac>,<mode>[,<passwd>[,<class>]]

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

| Command | Possible responses |
|--|--|
| AT+CLCK="SC",1,1234 Note : Enable PIN | OK Note : PIN was correct |
| AT+CLCK? Note : Read PIN status | +CLCK:("PS",0),("SC",0),("FD",0),("PN",0),("PU",0),("PP",0),("PC",0) OK Note : PIN is enabled, no SIM lock, no network lock, no information on Call barring (no longer supported in GSM 07.07) |
| AT+CLCK="SC",0,5555 Note : Disable PIN | +CME ERROR: 16 Note: PIN was wrong |
| AT+CPIN=1234 Note : Enter PIN | OK Note : PIN was good |
| AT+CLCK=? Note : Request supported facilities | +CLCK: ("PS","SC","AO","OI","OX","AI","IR","AB","AC","FD","PN","PU","PP","PN") OK Note : Supported facilities |
| AT+CLCK="PN",1,12345678 Note : Activate network lock | OK Network lock activated |
| AR+CLCK="AO",1,1234,2 Note : Activate all outgoing calls barring for data calls | OK Note : Call barring is activate |
| AT+CLCK="AO",2 Note : Query BAOC status | +CLCK: 1,2 OK Note : BAOC activate for data calls only |
| AT+CLCK="SC",0,0000 Note : Disable PIN | +CME ERROR: 521 Note : PIN deactivation is forbidden with this SIM card |

Note:

The **Syntax** need to be checked.

7.4.3 Defined values :

<fac> : supported facilities

- "PS" : SIM lock facility with a 8 digits password.
- "SC" : PIN enabled (<mode> = 1) / disabled (<mode> = 0)

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- "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 Inc. When Roaming outside Home Country)
- "AB" : All Barring services
- "AG" : All outGoing barring services
- "AC" : All inComing barring services
- "PN" : Network lock with a 8 digits password (NCK).
- "PU" : Network Subset lock with a 8 digits password (NSCK).
- "PP" : Service Provider lock with a 8 digits password (SPCK).
- "PC" : Corporate lock with a 8 digits password (CCK).
- "FD" : SIM Fixed Dialing Numbers (FDN) memory feature (PIN2 is required as <password>)

<mode>

- 0 : unlock the facility
- 1 : lock the facility
- 2 : query status

<class> : A facility status can be changed for only one class, or for all classes (7 or omitted).

<class>

- 1 : Voice (telephony)
- 2 : Data (apply to all bearer services)

- 8 : Short Message service
- 7 : Equal to all classes (Default value)

Any attempt to combine different classes will result in activation / deactivation / interrogation of all classes.

Password maximum length is given with the AT+CPWD=? Command.

Note: It will not possible to lock the FDN phonebook if this one is not loaded.

7.5 Change password +CPWD

7.5.1 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.

For the network lock ("PN"), unlocking is forbidden after 10 failed attempts to disable (unlock) the network lock with an incorrect password.

7.5.2 Syntax :

Command syntax : AT+CPWD= <fac>, <oldpwd>, <newpwd>

| Command | Possible 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 : CHV1/CHV2 must be on 8 digits maximum (4mini) For call barring, on 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 net lock |

Note:

The **Syntax** need to be checked.

7.5.3 Defined values :**<fac>** : facility

- "PS"
- "SC"
- "AO"
- "OI"
- "OX"
- "AI"
- "IR"
- "AB"
- "AG"
- "AC"
- "P2"
- "FD"
- "PN"
- "PU"
- "PP"
- "PC"

<oldpwd>, **<newpwd>**

On 4 or up to 8 or 16 digits accprding to the facility.

8 Phonebook commands

8.1 Select phonebook memory storage +CPBS

8.1.1 Description :

This command selects phonebook memory storage.

8.1.2 Syntax :

Command syntax : AT+CPBS=<pb>

| Command | Possible responses |
|-------------------------------------|--|
| AT+CPBS=? Note : Possible values | +CPBS: ("SM","FD","LD","MC","ON","ME","RC","MT") Note : only .EN. phonebook is not supported with this SIM card. |
| AT+CPBS? Note : Status | +CPBS: "SM",20,100 OK Note: ADN phonebook selected, 10 locations used, 20 locations available |
| AT+CPBS="SM" | OK |
| AT+CPBS="ME" | OK |

Note:

The **Syntax** need to be checked.

The ADN phonebook could not be selected as FDN is active.

8.1.3 Defined values :

<pb> : phonebook

- "SM" : ADN (SIM phonebook)
- "ME" : ME (ME phonebook)

8.2 Read phonebook entries +CPBR

8.2.1 Description :

This command returns phonebook entries for a range of locations from the current phonebook memory storage selected with +CPBS.

Note :

for all phonebook read commands (+CPBR, +CPBF, +CPBN, +CPBP, +CNUM), the TON/NPI MSB of each number is set to 1 (ex : a TON/NPI stored as 17 is displayed as 145).

8.2.2 Syntax :

Command syntax : AT+CPBR=<first_entry>[,<last_entry>]

| Command | Possible responses |
|--------------|---|
| AT+CPBR=? | +CPBR: (1-100),40,12 OK Note : 100locations (from 1 to100), max length for phone number is 40digits, 12 characters max for the text |
| AT+CPBR? | ERROR |
| AT+CPBR=10 | +CPBR: 10,"12345678",129,"NON" OK Note: Display location 10 |
| AT+CPBR=1,10 | +CPBR: 1,"13911133127",129,"" +CPBR: 2,"13511015868",129,"YING" +CPBR: 3,"13520941547",129,"nm" +CPBR: 4,"01064345558",129,"11" +CPBR: 5,"13691580530",129,"22" +CPBR: 6,"13911828812",129,"33" +CPBR: 7,"13520941547",129,"44" +CPBR: 8,"13521835820",129,"" +CPBR: 9,"13911133127",129,"LINYX" +CPBR: 10,"12345678",129,"NON" OK Note : Display locations 12,13,14 with location, number, type (TON/NPI), Text |
| AT+CPBR=11 | +CPBR: 11,"01012312312",129,"805F204E09FFFF" OK Note: Display location 11 |
| AT+CPBR=52 | OK Note: location 52 is empty |
| AT+CPBR=356 | +CME ERROR: 21 Note : Invalid index because the maximize is 355 |

8.2.3 Defined values :

<first_entry>, <last_entry>

location (or range of locations) where to read phonebook entry.

8.3 Find phonebook entries +CPBF**8.3.1 Description :**

This command returns phonebook entries with alphanumeric fields starting with a given string. 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", "SN" 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.

8.3.2 Syntax :

Command syntax : AT+CPBF=<string>

| Command | Possible responses |
|-------------|--|
| AT+CPBF=? | +CPBF: 20,12 OK Note : Max length for phone number is 20 digits, 12 characters for the text |
| AT+CPBF? | ERROR |
| AT+CPBF="L" | +CPBF: 13,"01085966659",129,"lin" +CPBF: 9,"13911133127",129,"LINYX" OK Note : Display locations with text field starting with L |
| AT+CPBF="h" | +CME ERROR: 22 Note: Entry not found |
| AT+CPBF="" | +CPBF: 1,"13911133127",129,"" +CPBF: 8,"13521835820",129,"" +CPBF: 14,"01086982235",129,"" +CPBF: 20,"0301234567",129,"8052A8FFFF" +CPBF: 18,"02822334455",129,"805F20FFFF" +CPBF: 11,"01012312312",129,"805F204E09FFFF" +CPBF: 17,"02712345678",129,"8079FB52A8FFFF" +CPBF: 4,"01064345558",129,"11" +CPBF: 5,"13691580530",129,"22" +CPBF: 6,"13911828812",129,"33" +CPBF: 7,"13520941547",129,"44" +CPBF: 16,"02512345678",129,"805F20FFFF" +CPBF: 19,"02912345678",129,"8079FB" +CPBF: 12,"02411112222",129,"80XYZ" +CPBF: 13,"01085966659",129,"lin" +CPBF: 9,"13911133127",129,"LINYX" +CPBF: 15,"12345678010",129,"miler" +CPBF: 3,"13520941547",129,"nm" +CPBF: 10,"12345678",129,"NON" +CPBF: 2,"13511015868",129,"YING" OK Note: display all phonebook entries sorted in alphabetical order |

8.3.3 Defined values :

<string>

Searched starting string (depends on the format of data stored in the phonebooks)

8.4.3 Defined values :

<index> integer type value depending on the capacity of the phonebook memory.
<number> phone number in ASCII format.
<type> TON/NPI (Type of address byte in integer format).

Note:

for the <type> parameter, all values are allowed from 0 to 255, but the MSB will be set to 1 in all cases (ex : a <type> value of 17 will be written as 145).

<text> string type.

Note 1:

For the <text> parameter all strings starting with "80", "81" or "81" are considered in UCS2 format. See the APPENDIX E (Coding of Alpha fields in the SIM for UCS2).

Note 2:

The +CSCS (Select Character set) command does not affect the format for phonebook entries.

8.5 Phonebook phone search +CPBP

8.5.1 Description :

This specific command orders the product to search the phonebook for an item with the same phone number as that defined in the parameter.

8.5.2 Syntax :

Command syntax : AT+CPBP=<PhoneNumber>

| Command | Possible responses |
|--|---|
| AT+CPBP="+331290101" Note : Search entries corresponding to this phone number | +CPBP : 15,"+331290101",145,"Eric" OK Note : Display the entry corresponding to the specified phone number |
| AT+CPBP="+331290101" Note : Search entries corresponding to this phone number | +CPBP : 15,"01290101",129,"Eric" OK Note : Display the entry corresponding to the specified phone number |
| AT+CPBP="01290202" Note : Search entries corresponding to this phone number | +CPBP : 15,"+331290202",145,"David" OK Note : Display the entry corresponding to the specified phone number |
| AT+CPBP="+331288575" Note : Search entries corresponding to this phone number | +CPBP : 15,"+331290101",145,"8045682344FFFF " " (UCS2 format) OK Note : Display the entry corresponding to the specified phone number |
| AT+CPBP="0129" Note : Search entries corresponding to this phone number | +CME ERROR: 22 Note : Entry not found |

8.5.3 Defined values :

<PhoneNumber>

coded according to GSM 07.07 or GSM 07.05.

8.6 Move action in phonebook +CPBN

8.6.1 Description

This specific command instructs the product to make a forward or backward move in the phonebook (in alphabetical order).

This command is not allowed for the "EN" phonebook - which does not contain alphanumeric fields.

8.6.2 Syntax :

Command syntax : AT+CPBN=<mode>

| Command | Possible responses |
|-----------|---|
| AT+CPBN=? | +CPBN: (0-5) OK |
| AT+CPBN? | ERROR |
| AT+CPBN=0 | +CPBN: 8,"13521835820",129,"" OK Note : Display the first location |
| AT+CPBN=1 | +CPBN: 2,"13511015868",129,"YING" OK Note : Display the last location |
| AT+CPBN=2 | +CPBN: 8,"13521835820",129,"" OK Note : Display Next valid item in alphabetical order |
| AT+CPBN=3 | +CPBN: 2,"13511015868",129,"YING" OK Note : Display Next valid item Previous valid item in alphabetical order |
| AT+CPBN=4 | +CPBN: 2,"13511015868",129,"YING" OK Note : Display Last item read |
| AT+CPBN=5 | +CPBN: 23,"02112345678",129,"804E095F20FFFF" OK Note : Display Last item write |
| AT+CPBN=6 | +CME ERROR: 3 |

Using mode 4 and 5 with +CPBF command and CPBW :

| Command | Possible responses |
|---|---|
| AT+CPBF="Er" Note : Find "Er" in phonebook | +CPBF : 15,"+331290101",145,"Eric" OK Note : Display the location |
| AT+CPBN=2 Note : Read the next location | +CPBN : 5,"+33147658987",145,"Frank" OK Note : Display the following location |
| AT+CPBF="Er" Note : Find "Er" in phonebook | +CPBF : 15,"+331290101",145,"Eric" OK Note : Display the location |
| AT+CPBN=4 Note : Get the last location read | +CPBF : 15,"+331290101",145,"Eric" OK Note : Display the last location read |
| AT+CPBW="0146290800",129,"WM" Note : Write an item at the first location available | OK Note : No information about this location |
| AT+CPBN=4 Note : Get the last location read | +CPBF : 15,"+331290101",145,"Eric" OK Note : Display the last location read |
| | AT+CPBN=38,"0146290800,129,"WM" Note : Display the last item written with its location |
| AT+CPBN=4 Note : Get the last item read | AT+CPBN=38,"0146290800,129,"WM" Note : Now the last item read is the last written item too |
| AT+CPBF="800041FFFF" Note : Find "800041" in phonebook | +CPBF : 15,"+3312345",145,"8000414339FFFF" OK Note : Display this location |
| AT+CPBN=4 Note : Get the last location read | +CPBF : 15,"+3312345",145,"8000414339FFFF" OK Note : Display the last location read |

Please note that the AT+CPBN=5 command is useful after an AT+CPBW command used without a location.

8.6.3 Defined values :

<mode>

- 0: First item
- 1: Last item
- 2: Next valid item in alphabetical order
- 3: Previous valid item in alphabetical order
- 4: Last item read (usable only if a read operation has been performed on the current phonebook since the end of initialization (+WIND: 4))
- 5: Last item written (usable only if a write operation has been performed on the current phonebook since the end of initialization (+WIND: 4))

8.7 Subscriber number +CNUM

8.7.1 Description :

This command returns the subscriber MSISDN(s).
If the subscriber has different MSISDNs for different services, each MSISDN is returned in a separate line.

8.7.2 Syntax :

Command syntax: AT+CNUM

Response syntax: +CNUM : <alpha1>, <number1>, <type1>
<CR><LF> +CNUM : <alpha2>, <number2>, <type2> ...

| Command | Possible responses |
|-----------|--------------------|
| AT+CNUM=? | OK |
| AT+CNUM? | ERROR |
| AT+CNUM | OK |

8.7.3 Defined values :

<alphax> optional alphanumeric string associated with <numberx>
<numberx> string type phone number with format as specified by <typex>
<typex> type of address byte in integer format

8.10 Set Voice Mail Number +CSVM

8.10.1 Description :

This commands allows to set/get and enable/disable the voice mail number in memory.

8.10.2 Syntax :

Command syntax : AT+CSVM=<mode>[,<number>[,<type>]]

| Command | Possible responses |
|---------------------|------------------------------|
| AT+CSVM | +CME ERROR: 3 |
| AT+CSVM? | +CSVM: 0,"888",129 OK |
| AT+CSVM=? | +CSVM: (0-1),(129,145) OK |
| AT+CSVM=0,"888",129 | OK |

8.10.3 Defined values :

<mode>

0: Disable the voice mail number

1: Enable the voice mail number

<number>

Phone number in ASCII format.

<type>

TON/NPI (Type of address byte in integer format).

Note :

For the <type> parameter, all values are allowed from 0 to 255, but the MSB will be set to 1 in all cases (ex : a <type> value of 17 will be written as 145).

9 Short Messages commands

9.1 Parameters definition

- <da>** Destination Address, coded like GSM 03.40 TP-DA
- <dcs>** Data Coding Scheme, coded like in document [5].
- <dt>** Discharge Time in string format :
"yy/MM/dd, hh :mm :ss 晧 z"(Year [00-99], Month [01-12],
Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
- <fo>** First Byte, coded like SMS-SUBMIT first byte in document [4],
default value is 17 for SMS-SUBMIT
- <index>** Place of storage in memory.
- <length>** Text mode (+CMGF=1): number of characters
PDU mode (+CMGF=0): length of the TP data unit in bytes
- <mem1>** Memory used to list, read and delete messages (+CMGL, +CMGR
and +CMGD).
- <mem2>** Memory used to write and send messages (+CMGW, +CMSS).
- <mid>** CBM Message Identifier.
- <mr>** Message Reference.
- <oa>** Originator Address.
- <pid>** Protocol Identifier.
- <pdu>** For SMS : GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal
format, coded as specified in doc [4] For CBS : GSM
03.41 TPDU in hexadecimal format
- <ra>** Recipient Address.
- <sca>** Service Center Address
- <scts>** Service Center Time Stamp in string format :
"yy/MM/dd, hh :mm :ss 晧 z"
(Year/Month/Day, Hour:Min:Seconds 晧 imeZone)
- <sn>** CBM Serial Number
- <st>** Status of a SMS-STATUS-REPORT
- <stat>** Status of message in memory.
- <tooa>** Type-of-Address of <oa>.
- <tora>** Type-of-Address of <ra>.
- <tosca>** Type-of-Address of <sca>.
- <total1>** Number of message locations in <mem1>.
- <total2>** Number of messages locations in <mem2>.
- <used1>** Total number of messages locations in <mem1>.
- <used2>** Total number of messages locations in <mem2>.
- <vp>** Validity Period of the short message, default value is 167

9.2 Select message service +CSMS

9.2.1 Description :

The supported services are originated (SMS-MO) and terminated short message (SMS-MT) + Cell Broadcast Message (SMS-CB) services.

9.2.2 Syntax :

Command syntax : AT+CSMS=<service>

| Command | Possible responses |
|--|---|
| AT+CSMS=0 Note : SMS AT command Phase 2 version 4.7.0 | +CSMS: 1,1 OK Note : SMS-MO, SMS-MT |
| AT+CSMS=1 Note : SMS AT command Phase 2 + | +CMS ERROR: 303 Note : SMS-MO, SMS-M |
| AT+CSMS? Note : Current values ? | +CSMS: 0,1,1,1 OK Note : GSM 03.40 and 03.41 (SMS AT command Phase 2 version 4.7.0) |
| AT+CSMS=? Note : Possible services | +CSMS: (0,1) OK |

9.2.3 Defined values :

<service>

0: SMS AT commands are compatible with GSM 07.05 Phase 2 version 4.7.0.

1: SMS AT commands are compatible with GSM 07.05 Phase 2 + version .

9.3 New Message Acknowledgement +CNMA

Notes: We only return OK on current version

9.3.1 Description :

This command allows reception of a new message routed directly to the TE to be acknowledged. In TEXT mode, only positive acknowledgement to the network (RP-ACK) is possible. In PDU mode, either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network is possible.

Acknowledge with +CNMA is possible only if the +CSMS parameter is set to 1 (+CSMS=1) when a +CMT or +CDS indication is shown (see +CNMI command).

If no acknowledgement is given within the network timeout, an RP-ERROR is sent to the network, the <mt> and <ds> parameters of the +CNMI command are then reset to zero (do not show new message indication).

9.3.2 Syntax :

Command syntax in text mode :

AT+CNMA

Command syntax in PDU mode :

AT+CNMA [= <n> [, <length> [<CR>

PDU is entered <ctrl-Z / ESC>]]]

Note:

PDU is entered using <ackpdu> format instead of <pdu> format (e.g.. SMSC address field is not present).

Example of acknowledgement of a new message in TEXT mode

| Command | Possible responses |
|--|---|
| AT+CMGF=1 Note : Set TEXT mode | OK Note : TEXT mode valid |
| AT+CNMI=2,2,0,0,0 Note : <mt>=2 | OK |
| | +CMT : .123456.,.98/10/01,12 :30 00+00.,129,4 ,32,240, .15379.,129,5<CR><LF> Received message Note : message received |
| AT+CNMA Note : acknowledge the message received | OK Note : send positive acknowledgement to the network |
| AT+CNMA Note : try to acknowledge again | +CMS ERROR : 340 Note :no +CNMA acknowledgment expected |

Example of acknowledgement of a new message in PDU mode:

| Command | Possible responses |
|---|--|
| AT+CMGF=0 Note : Set PDU mode | OK Note : PDU mode valid |
| | +CMT: ,29 07913366003000F1240B913366920547 F30000003003419404800B506215D42E CFE7E17319 Note : message received |
| AT+CNMA=2,<length> <CR> . Pdu message . <Ctrl-Z/ESC> Note : negative acknowledgement for the message. | OK Note : send a negative acknowledgement to the network (RP-ERROR) with PDU message (<ackpdu> format). |
| AT+CNMA Note : try to acknowledge again | +CMS ERROR : 340 Note :no +CNMA acknowledgment expected |

9.3.3 Defined values :

<n> : Type of acknowledgement in PDU mode
 0: send RP-ACK without PDU (same as TEXT mode)
 1: send RP-ACK with optional PDU message
 2: send RP-ERROR with optional PDU message
 <length>: Length of the PDU message

9.4 Preferred Message Storage +CPMS

9.4.1 Description :

This command allows the message storage area to be selected (for reading, writing, etc).

9.4.2 Syntax :

Command syntax : AT+CPMS=<mem1>,[<mem2>]

| Command | Possible responses |
|---|---|
| AT+CPMS=? Notes: List possible parameters. | +CPMS: ("SM", "BM", "SR"), ("SM") |
| AT+CPMS="BM" Notes: Select CBM message storage | +CPMS: 2,20,3,10 OK Note : Read, list, delete CBM from RAM 2 CBM are stored in RAM |
| AT+CPMS="SR" Notes: set status report storage | TO BE TESTED |

Note:

At present PIML only support "SM" storage.

9.4.3 Defined values :

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

- "SM": SMS message storage in SIM (default)

- "BM": CBM message storage (in volatile memory).

- "SR" : Status Report message storage (in SIM if the EF-SMR file exists, otherwise in the ME non volatile memory)

Note :

"SR" ME non volatile memory is cleared when another SIM card is inserted. It is kept, even after a reset, while the same SIM card is used.

<mem2>: Memory used to write and send messages

- "SM" : SMS message storage in SIM (default).

If the command is correct, the following message indication is sent:

+CPMS: <used1>,<total1>,<used2>,<total2>

When <mem1> is selected, all following +CMGL, +CMGR and +CMGD commands are related to the type of SMS stored in this memory.

9.5 Preferred Message Format +CMGF

9.5.1 Description :

The message formats supported are text mode and PDU mode.

In PDU mode, a complete SMS Message including all header information is given as a binary string (in hexadecimal format). Therefore, only the following set of characters is allowed: {'0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'}. Each pair of characters is converted to a byte (e.g.: '41' is converted to the ASCII character 'A', whose ASCII code is 0x41 or 65).

In Text mode, all commands and responses are in ASCII characters.

The selected format is stored in EEPROM by the +CSAS command.

9.5.2 Syntax :

Command syntax : AT+CMGF

| Command | Possible responses |
|--|--|
| AT+CMGF ? Note : Current message format | +CMGF: 1 OK Note : Text mode |
| AT+CMGF=? Note : Possible message format | +CMGF: (0-1) OK |
| AT+CMGF=0 Note : Set PDU mode | OK Note : PDU mode valid |
| AT+CMGS=14<CR> 0001030691214365000004C9E9340B Note : Send complete MSG in PDU mode, no SC address | +CMGS: 4 OK Note : MSG correctly sent, <mr> is returned |

9.5.3 Defined values :

The <pdu> message is composed of the SC address (00 means no SC address given, use default SC address read with +CSCA command) and the TPDU message.

In this example, the length in **bytes** of the TPDU buffer is 14, coded as GSM 03.40

In this case the TPDU is : 0x01 0x03 0x06 0x91 0x21 0x43 0x65 0x00 0x00 0x04 0xC9 0xE9 0x34 0x0B, which means regarding GSM 03.40 :

| | |
|-------------------|---|
| <fo> | 0x01 (SMS-SUBMIT, no validity period) |
| <mr> (TP-MR) | 0x03 (Message Reference) |
| <da> (TP-DA) | 0x06 0x91 0x21 0x43 0x65 (destination address +123456) |
| <pid> (TP-PID) | 0x00 (Protocol Identifier) |
| <dcs> (TP-DCS) | 0x00 (Data Coding Scheme : 7 bits alphabet) |
| <length> (TP-UDL) | 0x04 (User Data Length, 4 characters of text) |
| TP-UD | 0xC9 0xE9 0x34 0x0B (User Data : ISSY) |

TPDU in hexadecimal format must be converted into two ASCII characters. For example, the byte 0x2A is presented to the ME as two characters '2' (ASCII 50) and 'A' (ASCII 65).

9.6 Save Settings +CSAS

9.6.1 Description :

All settings specified by the +CSCA and +CSMP commands are stored in EEPROM if the SIM card is a Phase 1 card or in the SIM card if it is a Phase 2 SIM card.

9.6.2 Syntax :

Command syntax : AT+CSAS

| Command | Possible responses |
|---|--------------------------------------|
| AT+CSAS <i>Note : Store +CSCA and +CSMP parameters</i> | OK <i>Note : Parameters saved</i> |

9.6.3 Defined values :

No parameter

9.7 Restore settings +CRES

9.7.1 Description :

All settings specified in the +CSCA and +CSMP commands are restored from EEPROM if the SIM card is Phase 1 or from the SIM card if it is a Phase 2 one.

9.7.2 Syntax :

| Command | Possible responses |
|---|---|
| AT+CRES <i>Note : Restore +CSAS and +CSMP parameters</i> | OK <i>Note : Parameters restored</i> |

9.7.3 Defined values :

No parameter

9.8 Show text mode parameters +CSDH

9.8.1 Description :

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

9.8.2 Syntax :

Command syntax : AT+CSDH

| Command | Possible responses |
|---|---|
| AT+CSDH? <i>Note : Current value</i> | +CSDH: 0 OK <i>Note : Do not show header values</i> |

9.8.3 Defined values:

No parameter.

9.9 New message indication +CNMI

9.9.1 Description :

This command selects the procedure for message reception from the network.

9.9.2 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 : .SM.,1 Note : message received |
| AT+CNMI=2,2,0,0,0 Note : <mt>=2 | OK +CMT : .123456.,.98/10/01,12 :30 00+00.,129,4 .32,240, .15379.,129,5<CR><LF> message received Note : message received |
| AT+CNMI=2,0,0,1,0 Note : <ds>=1 | OK |
| AT+CMGS=.+33146290800.<CR> Message to send <ctrl-Z> Note : Send a message in text mode | +CMGS : 7 OK Note : Successful transmission |
| | +CDS : 2, 116, .+33146290800., 145, .98/10/01,12 :30 :07+04., .98/10/01 12 :30 :08+04., 0 Note : message was correctly delivered |

9.9.3 Defined values :

<mode> : controls the processing of unsolicited result codes

0: Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications

1: Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE

2: Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation. Otherwise forward them directly to the TE

3: Forward unsolicited result codes directly to the TE. TA-TE link specific inband used to embed result codes and data when TA is in on-line data mode

Important note : only <mode>=2 is supported.

Any other value for <mode> (0,1 or 3) is accepted (return code will be OK), but the processing of unsolicited result codes will be the same as with<mode>=2.

<mt> : sets the result code indication routing for SMS-DELIVER indications.

Default is 1.

0: No SMS-DELIVER indications are routed.

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

2: SMS-DELIVERs (except class 2 messages) are routed using unsolicited

code :

if PDU mode :

+CMT : [<alpha>,<length> <CR> <LF> <pdu>

if text mode :

+CMT : <oa>,<alpha>,<scts> [<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>] <CR><LF><data>

3: Class 3 SMS-DELIVERs are routed directly using code in <mt>=2 ; Other classes messages result in indication <mt>=1

<bm> : defines the rules for storing the received CBMs (Cell Broadcast Message) types. They depend also on the coding scheme (text or PDU) and the setting of Select CBM Types (see +CSCB command). Default is 0.

0: No CBM indications are routed to the TE. The CBMs are stored.

1: The CBM is stored and an indication of the memory location is routed to the customer application using unsolicited result code: +CBMI: "BM", <index>

2: New CBMs are routed directly to the TE using unsolicited result code.

If PDU mode :

+CBM : <length><CR><LF><pdu> or

If text mode :

+CBM :<sn>,<mid>,<dcsc>,<page>,<pages> <CR><LF> <data>

3: Class 3 CBMs : as <bm>=2. Other

classes CBMs : as <bm>=1.

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

0: No SMS-STATUS-REPORTs are routed.

1: SMS-STATUS-REPORTs are routed using unsolicited code :

If PDU mode :

+CDS : <length> <CR> <LF> <pdu> (PDU mode) or

If text mode :

+CDS : <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> (Text mode)

2: SMS-STATUS-REPORTs are stored and routed using the unsolicited result code : +CDSI: "SR",<index>

<bfr> Default is 0.

0: TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> = 1 to 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.

9.10 Read message +CMGR

9.10.1 Description :

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

9.10.2 Syntax :

Command syntax : AT+CMGR=<index>

Response syntax for text mode:

+CMGR :<stat>,<oa>,[<alpha>] <scts> [,<toa>,<fo>, <pid>,<dc>,<sca>,<tosca>,<length>]
<CR><LF> <data> (for SMS-DELIVER only)

+CMGR : <stat>,<da>,[<alpha>] [,<toa>,<fo>,<pid>,<dc>, [<vp>], <sca>,<tosca>,<length>]<CR><LF> <data> (for SMS-SUBMIT only)

+CMGR : <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (for SMS-STATUS-REPORT only)

Response syntax for PDU mode :

+CMGR: <stat>, [<alpha>] ,<length> <CR><LF> <pdu>

A message read with status "REC UNREAD" will be updated in memory with the status "REC READ".

Note :

the <stat> parameter for SMS Status Reports is always "READ".

Example :

| Command | Possible 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.,<CR><LF> ABCdefGHI OK |
| AT+CMGR=1 Note : Read the message again | +CMGR: .REC UNREAD.,,0146290800., .98/10/01,18 :22 :11+00.,<CR><LF> ABCdefGHI OK Note : Message is read now |
| AT+CMGR=2 Note : Read at a wrong index | +CMS ERROR: 321 Note : Error : invalid index |
| AT+CMGF=0 ;+CMGR=1 Note : In PDU mode | +CMGR: 2,,<length> <CR><LF><pdu> OK Note : Message is stored but unsent, no <alpha>field |
| AT+CMGF=1;+CPMS=.SR.:+CNMI=,,,2 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 Read the SMS Status Report | +CMGR: "READ",6,160, "+33612345678",129,"01/05/31,15:15:09 +00", "01/05/31,15:15:09+00",0 OK |

9.10.3 Defined values :

See above.

9.11 List message +CMGL

9.11.1 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.

9.11.2 Syntax :

Command syntax : AT+CMGL=<stat>

Response syntax for text mode:

+CMGL : <index>,<stat>,<da/oa>[,<alpha>], [<scts>, <tooa/toda>, <length>]

<CR><LF><data> (for **SMS-DELIVER** and **SMS-SUBMIT**, may be followed by other <CR><LF>+CMGL:<index>...)

+CMGL : <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (for **SMS-STATUS-REPORT** only, may be followed by other <CR><LF>+CMGL:<index>...)

Response syntax for PDU mode : +CMGL : <index>,<stat>, [<alpha>], <length> <CR><LF> <pdu> (for SMSDELIVER, SMS-SUBMIT and SMS-STATUS-REPORT, may be followed by other <CR><LF>+CMGL:<index>...)

| Command | Possible responses |
|---|---|
| AT+CMGL="REC UNREAD" Note : List unread messages in text mode | +CMGL: 1,.,REC UNREAD,.,0146290800., <CR><LF> Unread message ! +CMGL: 3,.,REC UNREAD,.,.46290800., <CR><LF> Another message unread! OK Note : 2 messages are unread, these messages will then have their status changed to .REC READ. (+CSDH:0) |
| AT+CMGL="REC READ" Note : List read messages in text mode | +CMGL: 2,.,REC READ,.,0146290800., <CR><LF> Keep cool OK |
| AT+CMGL="STO SENT" Note : List stored and sent messages in text mode | OK Note : No message found |
| AT+CMGF=0 Note : Set PDU mode. AT+CMGL=1 Note : List read messages in PDU mode | +CMGL: 1,1,.,26 <CR><LF> 07913366003000F3040B913366920547 F40013001190412530400741AA8E5A9C 5201 OK |

9.11.3 Defined values

<stat> possible values (status of messages in memory) :

| Text mode possible values | PDU mode possible values | Status of messages in memory |
|----------------------------------|---------------------------------|-------------------------------------|
| “REC UNREAD” | 0 | received unread messages |
| “REC READ” | 1 | received read messages |
| “STO UNSENT” | 2 | stored unsend messages |
| “STO SENT” | 3 | stored send messages |
| “ALL” | 4 | all messages |

Note :

For SMS Status Reports, only “ALL” / 4 and “READ” / 1 values of the <stat> parameter will list messages ; other values will only return OK.

9.12 Send message +CMGS

9.12.1 Description :

The <address> field is the address of the terminal to which the message is sent. To send the message, simply type, <ctrl-Z> character (ASCII 26). 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').

9.12.2 Syntax :

Command syntax in text mode :

AT+CMGS= <da> [,<tda>] <CR>

text is entered <ctrl-Z / ESC >

Command syntax in PDU mode :

AT+CMGS= <length> <CR>

PDU is entered <ctrl-Z / ESC >

| Command | Possible responses |
|---|---|
| AT+CMGS=.+33146290800.<CR> Please call me soon, Fred. <ctrl-Z> Note : Send a message in text mode | +CMGS: <mr> OK Note : Successful transmission |
| AT+CMGS=<length><CR><pdu><ctrl-Z> Note : Send a message in PDU mode | +CMGS: <mr> OK Note : Successful transmission |

The message reference, <mr>, which is returned to the application is allocated by the product. This number begins with 0 and is incremented by one for each outgoing message (successful and failure cases); it is cyclic on one byte (0 follows 255).

Note:

this number is not a storage number – outgoing messages are not stored.

9.12.3 Defined values :

See above paragraphs.

9.13 Write Message to Memory +CMGW

9.13.1 Description :

This command stores a message in memory (either SMS-SUBMIT or SMSDELIVERS). 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.

9.13.2 Syntax :

Command syntax in text mode : (<index> is returned in both cases)

AT+CMGW= <oa/da> [,<tooa/toda> [,<stat>]] <CR>

enter text<ctrl-Z / ESC>

Command syntax in PDU mode :

AT+CMGW= <length> [,<stat>] <CR>

give PDU<ctrl-Z / ESC>

Response syntax:

+CMGW: <index> or +CMS ERROR: <err> if writing fails

| Command | Possible 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><pdu><ctrl-Z> Note : Write a message in PDU mode | +CMGW: <index> OK Note : Message stored in <index> |

9.13.3 Defined values :

Parameter Definition :

<oa/da> : Originating or Destination Address Value in string format.

<tooa/toda> : Type of Originating / Destination Address.

<stat>: Integer type in PDU mode (default 2 for +CMGW), or string type in text mode (default "STO UNSENT" for +CMGW). Indicates the status of message in memory. If <stat> is omitted, the stored message is considered as a message to send.

<stat>

0: "REC UNREAD"

1: "REC READ"

2: "STO UNSENT"

3: "STO SENT"

<length> : Length of the actual data unit in bytes

9.14 Send Message From Storage +CMSS

9.14.1 Description :

This command sends a message stored at location value <index>.

9.14.2 Syntax :

Command syntax: AT+CMSS=<index>[,<da> [,<toda>]]

Response syntax:

+CMSS : <mr> or +CMS ERROR: <err> if sending fails

If a new recipient address <da> is given, it will be used instead of the one stored with the message

| Command | Possible responses |
|--|---|
| AT+CMGW=0660123456<CR> Today is my birthday | +CMGW : 5 OK Note :Message stored with index 5 |
| AT+CMSS=5, 0680654321 Note : Send the message 5 to a different destination number | AT+CMSS :<mr> OK Note : Successful transmission |
| AT+CMSS=5, 0680654321 Note : Send the message 5 to a different destination number | +CMSS :<mr> OK Note : Successful transmission |

9.14.3 Defined values

<index>

<da>

<toda>

<mr>

See above descriptions.

9.15 Set Text Mode Parameters +CSMP

9.15.1 Description :

This command is used to select a value for <vp>, <pid>, and <dc>.

9.15.2 Syntax ;

Command syntax : AT+CSMP=<fo>, <vp>, <pid>,<dc>

| Command | Possible responses |
|--|---|
| AT+CSMP? | +CSMP: 0,0,0,0 OK |
| Note : current values | Note : No validity period <dc>= PCCP437 alphabet (8 bits ->7 bits) |
| AT+CMPS=17,23,64,244 | OK |
| Note :<vp> = 23 (2 hours, relative format) <dc> = GSM 8 bits alphabet | Note : Command correct |

9.15.3 Defined values :

The <fo> byte comprises 6 different fields :

| b7 | b6 | B5 | b4 | b3 | b2 | b1 | b0 |
|----|-----|-----|-----|----|----|-----|----|
| RP | UDH | 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 which 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)

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 | $(VP + 1) \times 5$ minutes (up to 12 hours) |
| 144 to 167 | 12 hours + $(VP - 143) \times 30$ minutes) |
| 168 to 196 | $(VP - 166) \times 1$ day |
| 197 to 255 | $(VP - 192) \times 1$ week |

<pid> is used to indicate the higher layer protocol being used or indicates interworking with a certain type of telematic device. For example, 0x22 is for group 3 telefax, 0x24 is for voice telephone, 0x25 is for ERMES (European Radio Messaging System).

<dcs> is used to determine the way the information is encoded. Compressed text is not supported. Only GSM default alphabet, 8 bit data and UCS2 alphabet are supported.

9.16 Delete message +CMGD

9.16.1 Description :

This command is used to delete one or several messages from preferred message storage ("BM" SMS CB 'RAM storage', "SM" SMSPP storage 'SIM storage' or "SR" SMS Status-Report storage).

9.16.2 Syntax :

Command syntax : AT+CMGD=<Index> [,<DelFalg>]

| Command | Possible 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 |

9.16.3 Defined values

<index>

(1-20) When the preferred message storage is "BM" Integer type values in the range of location numbers of SIM Message memory when the preferred message storage is "SM" or "SR".

<DelFlag>

- 0 Delete message at location <index>.
- 1 Delete All READ messages
- 2 Delete All READ and SENT messages
- 3 Delete All READ, SENT and UNSENT messages
- 4 Delete All messages.

Note :

when the preferred message storage is "SR", as SMS status reports are assumed to have a "READ" status, if <DelFlag> is greater than 0, all SMS status reports will be deleted.

9.17 Service center address +CSCA

9.17.1 Description

This command is used to indicate to which service center the message must be sent. The product has no default value for this address. If the application tries to send a message without having indicated the service center address, an error will be generated. Therefore, the application must indicate the SC address when initialising the SMS. This address is then permanently valid. The application may change it if necessary.

9.17.2 Syntax :

Command syntax : AT+CSCA=<sca>

| Command | Possible responses |
|---|--|
| AT+CSCA=.0696741234. Note : Service center initialization | OK |
| AT+CMGS=.+33146290800.<CR> Happy Birthday ! <ctrl-Z> Note : | +CMGS: 1 OK Note : Successful transmission |

9.17.3 Defined values :

<sca>

See above descriptions

9.20 Message status modification +WMSC

9.20.1 Description

This commands allow the manipulation of a message status. The accepted status changes are from READ to NOT READ and vice versa, and from SENT to NOT SENT and vice versa.

9.20.2 Syntax:

Command syntax : AT+WMSC= <loc>, <status>

| Command | Possible responses |
|--|--------------------|
| The study of the command has not began. | |

Possible responses:

| | |
|-----------------|---|
| OK | if the location is valid |
| +CMS ERROR: 321 | if <loc> is invalid or free |
| +CMS ERROR: 302 | if the new <status> and the previous one are incompatible (1) |

Note 1 :

If all the parameters are correct, the product overwrites the whole SMS in SIM. Only the first byte (Status byte) is changed.

9.20.3 Defined values :

<loc> location number of the stored message (integer)

<status> new status to be stored, as for +CMGL command :

| PDU Mode | Text Mode |
|----------|--------------|
| 0 | "REC UNREAD" |
| 1 | "REC READ" |
| 2 | "STO UNSENT" |
| 3 | "STO SENT" |

9.21 Message overwriting +WMGO

9.21.1 Description :

The WMGO command is used to specify a location in the SIM, for the next SMS storing with +CMGW command. The defined location is used only once : +WMGO has to be used again to perform another overwrite.

Important notes :

- If the external application specifies a free location, and an incoming message is received before the AT+CMGW command occurs, the product may store the incoming message at the specified available location. If the user then issues an AT+CMGW command without changing the location with another AT+WMGO, the received message will be overwritten.
- The location number is not kept over a software reset.

9.21.2 Syntax :

Command syntax : AT+WMGO= <loc>

| Command | Possible 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+WMGO=4 | |
| AT+CMGW="+33146299704"<CR> You are overwritten<ctrl-Z> | +CMGW: 4 OK Note : New Message stored in index 4 |
| AT+WMGO? | +WMGO: 4 OK |
| AT+WMGO=999 | +CMS ERROR: 321 |
| AT+WMGO=? | +WMGO: [<range of location>] OK |

9.21.3 Defined values :

<loc> location number of the SIM record to write or overwrite. Number depending of the SIM capacity.

9.22 Unchange SMS Status +WUSS

9.22.1 Description :

The +WUSS command allows to keep the SMS Status to UNREAD after +CMGR or +CMGL.

9.22.2 Syntax :

Command syntax : AT+WUSS = <mode>

| Command | Possible responses |
|------------|--|
| AT+WUSS=1 | OK |
| | +CMTI: "SM",10 Note : SMS has been received in index 10 |
| AT+CMGR=10 | +CMGR: "REC UNREAD","+33660669023",,"03/02/13,18: 36:35+00"<CR><LF> Do you want to change state ? OK |
| AT+CMGR=10 | +CMGR: "REC UNREAD","+33660669023",,"03/02/13,18: 36:35+00"<CR><LF> Do you want to change state ? OK Note : The state hasn't be updated |
| AT+WUSS=0 | OK |
| | +CMTI: "SM",11 Note : SMS has been received in index 11 |
| AT+CMGR=11 | +CMGR: "REC UNREAD","+33660669023",,"03/02/13,18: 56:55+00"<CR><LF> It is me again. OK |
| AT+CMGR=11 | +CMGR: "REC READ","+33660669023",,"03/02/13,18:56: 55+00"<CR><LF> It is me again. OK Note : The state has been updated |

9.22.3 Defined values :

<mode>

- <mode> : 1 The SMS Status will not change.
<mode> : 0 The SMS Status will change.

9.23 Cell Broadcast Message Types +CSCB

9.23.1 Description :

This command selects which types of CBMs allowed in both PDU and text modes.
And write CBM type ID into EF-CBMI file of SIM.

9.23.2 Syntax :

Command syntax : AT+CSCB=<mode>,<mids>,<dcss>

| Command | Possible responses |
|------------------------------|----------------------------|
| AT+CSCB=? | +CSCB: (0,1) OK |
| AT+CSCB? | <mode>,<mids>,<dcss> OK |
| AT+CSCB=<mode>,<mids>,<dcss> | OK |

9.23.3 Defined values

<mode>

- 0: CBM receive state is activation.
- 1: CBM receive state is passivation

<mids>

Cell Broadcast message type ID

<dcss>

Cell Broadcast message supported language

- 0 German
- 1 English
- 2 Italian
- 3 French
- 4 Spanish
- 5 Dutch
- 6 Swedish
- 7 Danish
- 8 Portuguese
- 9 Finnish
- 10 Norwegian
- 11 Greek
- 12 Turkish
- 13 Hungarian
- 14 Polish
- 32 Czech.

9.24 Cell Broadcast Message Identifiers +WCBM

9.24.1 Description :

This specific command is used to read the EF-CBMI SIM file.
 Remark: 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.

9.24.2 Syntax :

Command syntax : AT+WCBM= <mids>

| Command | Possible responses |
|--|---|
| AT+WCBM="10,100,1000,10000" Note : Write 4 messages identifiers in EFCBMI | OK Note : Successful write |
| AT+WCBM? Note : Read the CBMIs in EF-CBMI | +WCBM="10,100,1000,10000" OK Note : 4 CBMIs are stored in EF-CBMI |

The message reference, <mr>, which is returned to the application is allocated by the product. This number begins with 0 and is incremented by one for each outgoing message (successful and failure cases); it is cyclic on one byte (0 follows 255).

Note:

this number is not a storage number – outgoing messages are not stored.

9.24.3 Defined values :

<mids>

See above +CSCB command.

10 Supplementary Services commands

10.1 Call forwarding +CCFC

10.1.1 Description :

This commands allows control of the "call forwarding" supplementary service.

10.1.2 Syntax :

Command syntax :

AT+CCFC= <reason>, <mode> [, <number> [,<type> [,<class> [,<subaddr> [, <satype> [,<time>]]]]]]

Response syntax:

+CCFC: <status>, <class1> [, <number>, <type> [,<subaddr>, <satype> [,<time>]]] [<CR><LF>+CCFC: <status>, <class2> [, <number>, <type> [,<subaddr>, <satype> [,<time>]]] [...]]

| Command | Possible responses |
|---|--------------------------------------|
| AT+CCFC = 0,3,"13051204317" | OK |
| AT+CCFC = 0,3,"+8613051204317" | OK |
| AT+CCFC = 0,3," 01064345558" | OK |
| AT+CCFC = 0,3,"+861064345558" | OK |
| AT+CCFC =0,2 | +CCFC: 1,1,"+861064345558",145 OK |
| AT+CCFC =0,4 | OK |
| AT+CCFC =0,2 | +CCFC: 0,7 OK |
| AT+CCFC = 2,3,"+861064345558",,,,,,5 | OK |
| AT+CCFC= 0,3,+861064345558 | OK |

+CCFC responses are not sorted by <class> parameter, but only by the order of network response.

10.1.3 Defined values

<reason>

- 0 Unconditional
- 1 Mobile busy
- 2 No reply
- 3 Not reachable
- 4 All call forwarding
- 5 All conditional call forwarding

<mode>

- 0 Disable
- 1 Enable
- 2 Interrogate
- 3 Registration
- 4 Erasure

<type> : TON/NPI (Type of address byte in integer format) (default 145 when dialling string includes international access code character "+", otherwise 129)

<class>

- 1 Voice
- 2 Data
- 4 Fax
- 8 Short Messages
- 7 All classes

Note: The combination of different classes is not supported, it will only result in the activation / deactivation / status request of all classes (7).

If the FDN phonebook is activated, the registration is restricted to the phone numbers written in it.

if <Class> parameter is not given in the command, 7 is used as default value.

<subaddr> not managed

<satype> not managed

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

< status >

- 0 : not active
- 1 : active
- 2 : quiescent

10.2 Call barring +CLCK

10.2.1 Description :

This command allows control of the call barring supplementary service. Locking, unlocking or querying the status of call barring is possible for all classes or for a specific class, but not a combination of some.

10.2.2 Syntax :

Command Syntax : AT+CLCK= <fac>, <mode> [, <password> [, <class>]]

Response Syntax: (for <mode>=2 and command successful)

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

| Command | Possible responses |
|------------------------|---|
| AT+CLCK ="SC",1,1234 | OK |
| AT+CLCK ="SC",1,"1234" | OK |
| AT+CLCK ="AI",1,"1234" | OK |
| AT+CLCK ="AO",1,"1234" | OK |
| AT+CLCK ="AI",2 | +CLCK: 1,1 +CLCK: 1,8 OK notice: 1 is voice service, 8 is short message service, it barring both voice and short message service |
| AT+CLCK ="AO",0,"1234" | OK |
| AT+CLCK ="AO",2 | +CLCK: 0,7 OK |

10.2.3 Defined values :

<fac>

"AO", "OI", "OX" barring for outgoing calls
"AI", "IR" barring for incoming calls
"AG", "AC", "AB" for all calls barring (<mode>=0 only)

<mode>

0: Unlocks the facility
1: Locks the facility
2: Query status

<class> : see description for +CLCK command (Facility lock) or +CCFC (Call forwarding).

Note : A combination of different classes is not supported. It will only result in the activation / deactivation / status request for all classes (7).

The password code is over 4 digits maximum.

< status >

0 : not active
1 : active

10.3 Modify SS password +CPWD

10.3.1 Description :

This command is used by the application to change the supplementary service password.

10.3.2 Syntax :

Command Syntax: AT+CPWD=<fac>,<OldPassword>, <NewPassword>

| Command | Possible responses |
|---|-------------------------------------|
| AT+CPWD = "SC","1234","4321" notice: to perform this the pin lock must be active. | +CME ERROR: 3 |
| AT+CLCK="SC",1,"1234" AT+CPWD = "SC","1234","4321" | OK |
| AT+CPWD = "P2","12345678","87654321" | +CME ERROR: 18 SIM PUK2 required |
| AT+CPWD= "AI","1234","4321" | OK |

10.3.3 Defined values :

<fac>

see +CLCK command with only "P2" facility added (SIM PIN2).

Note : Whatever the facility specified, the change of password applies to all calls barring.

<OldPassword>, <NewPassword>

The password code is over up to 8 digits for P2 facility (4 to 8 digits).

The password code is over up to 4 digits for the other facilities (1 to 4 digits) .

10.4 Call waiting +CCWA

10.4.1 Description :

This command allows control of the call waiting supplementary service.
The product will send a +CCWA unsolicited result code when the call waiting service is enabled.

10.4.2 Syntax :

Command Syntax : AT+CCWA=<n>, [<mode> [, <class>]]

Response Syntax: (for <mode>=2 and command successful)

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

[...]]

Unsolicited result: +CCWA: <number>, <type>, <class> [,<alpha>] (when waiting service is enabled)

| Command | Possible responses |
|---|----------------------------|
| AT+CCWA =1,2 | +CCWA: 0,7 OK |
| AT+CCWA =1,1,1 | OK |
| AT+CCWA =,2 | +CCWA: 1,1 OK |
| When a call is active, an other call incoming | +CCWA: "13051204317",161,1 |

10.4.3 Defined values :

<n> : result code presentation status in the TA

0 : Disable

1 : Enable

<mode>

0 : Disable

1 : Enable

2 : Query status

<class>

1: Voice

2: Data

7: All classes (voice, data and fax)

A combination of different classes is **not supported**. It will only result in the activation / deactivation / status request for all classes (7).

<status>

0: not active

1: active

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<alpha> : optional string type alphanumeric representation of <number> corresponding to the entry found in the ADN or FDN phonebook.

10.5 Calling line identification restriction +CLIR

10.5.1 Description :

This command allows control of the calling line identification restriction supplementary service.

10.5.2 Syntax :

Command syntax : AT+CLIR=<n>

Response syntax : +CLIR :<n>,<m> (for AT+CLIR ?)

| Command | Possible responses |
|------------|--------------------|
| AT+CLIR=1 | OK |
| AT+CLIR? | +CLIR: 1,0 OK |
| AT+CLIR =2 | OK |
| AT+CLIR =0 | OK |

10.5.3 Defined values :

<n>: sets the line ID restriction for outgoing calls

- 0: Presentation indicator is used according to the subscription of the CLIR service
- 1: CLIR invocation
- 2: CLIR suppression

<m>: shows the 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

10.6 Calling line identification presentation +CLIP

10.6.1 Description :

This command allows control of the Calling Line Identifier presentation supplementary service. When presentation of the CLI (Calling Line Identifier) is enabled (and calling subscriber allows), +CLIP response is returned after every RING (or +CRING) result code.

10.6.2 Syntax :

Command syntax : AT+CLIP=<n>

Response syntax :

+CLIP: <n>,<m> (as response to AT+CLIP?)

+CLIP: <number>, <type>[,<subaddr>, <satype>, <alpha>] (for an incoming call, after each RING or +CRING indication)

| Command | Possible responses |
|----------------------|-------------------------------|
| AT+CLIP=0 | OK |
| AT+CLIP? | "+CLIP: 0,1 OK |
| AT+CLIP =1 | OK |
| When a call incoming | +CLIP: "01064345558",129,,,,0 |

10.6.3 Defined values :

<n>: parameter sets/shows the result code presentation in the TA

0: Disable

1: Enable

<m>: parameter shows the subscriber CLIP service status in the network

0: CLIP not provisioned

1: CLIP provisioned

2: Unknown (no network...)

10.7 Connected line identification presentation +COLP

10.7.1 Description :

This command allows control of the connected line identification presentation supplementary service - useful for call forwarding of the connected line.

10.7.2 Syntax :

Command syntax: AT+COLP=<n>

Response syntax:

+COLP: <n>,<m> (as response to AT+COLP?)

+COLP: <number>,<type> [,<subaddr>, <satype>, <alpha>]

after ATD command, before OK or CONNECT <speed>

| Command | Possible responses |
|------------------|--------------------|
| AT+COLP=1 | OK |
| AT+ COLP? | +COLP: 1,2 OK |
| AT+ COLP =0 | OK |
| When dial a call | No +COLP message |

10.7.3 Defined values

<n>: parameter sets/shows the result code presentation status in the TA

0: Disable

1: Enable

<m>: parameter shows the subscriber COLP service status in the network

0: COLP not provisioned

1: COLP provisioned

2: Unknown (no network)

10.12 Call related supplementary services +CHLD

10.12.1 Description :

This command is used to manage call hold and multiparty conversation (conference call). Calls can be put on hold, recovered, released or added to a conversation.

10.12.2 Syntax:

| Command | Possible responses |
|---|---|
| AT+CHLD=? | +CHLD: (0-4,11-17,21-27) OK |
| When a call is active, an other call is coming Run AT+CHLD=1 | Hold current one, active the other |

10.12.3 Defined values

<n>

- 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 accepts 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 accepts the other (held or waiting) call.
- 2X: Place all active calls on hold except call X with which communication is supported.
- 3: Adds a held call to the conversation.
- 4: Connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer).

10.13 List current calls +CLCC

10.13.1 Description :

This command is used to return a list of current calls.

10.13.2 Syntax :

Command syntax : AT+CLCC

Response syntax: OK (if no calls are available)

Else :

+CLCC : <id1>, <dir>, <stat>, <mode>, <mpty> [, <number>, <type>
[<alpha>]]

[<CR><LF>

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

<CR><LF>

OK

| Command | Possible responses |
|---------------------------------------|--------------------------------------|
| When a call incoming run: AT+CLCC? | "+CLCC: 1,1,4,0,0,"01064345558",129" |

10.13.3 Defined values :

<idx> integer type, call identification as described in GSM 02.30

<dir> (direction of the call)

0: mobile originated (MO) call

1: mobile terminated (MT) call

<stat> (state of the call):

0: active

1: held

2: dialling (MO call)

3: alerting (MO call)

4: incoming (MT call)

5: waiting (MT call)

<mode> (teleservice) :

0 : voice

1: data

9: unknown

<mpty> (multiparty)

0: call is not one of multiparty (conference) call parties

1: call is one of multiparty (conference) call parties

<number> string type phone number in format specified by <type>

<type> type of address byte in integer format

<alpha> optional string type alphanumeric representation of <number>.

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corresponding to the entry found in phonebook. (for UCS2 format see commands examples +CLIP, +CCWA or +COLP)

10.14 Supplementary service notifications +CSSN

10.14.1 Description :

This command refers to supplementary service related network initiated notifications.

10.14.2 Syntax:

Command syntax: AT+CSSN= <n>, <m>

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code **+CSSI:<code1>[,<index>]** is sent before any other MO call setup result codes. When <m>=1 and a supplementary service notification is received during a call, unsolicited result code **+CSSU:<code2>[,<index>,<number>,<type>]** is sent.

| Command | Possible responses |
|----------|--------------------|
| AT+CSSN? | +CSSN: 1,1 OK |

10.14.3 Defined values

<n> (parameter sets/shows the +CSSI result code presentation status) :

- 0: disable
- 1: enable

<m> (parameter sets/shows the +CSSU result code presentation status) :

- 0 : disable
- 1 : enable

<code1>

- 4: closed User Group call, with CUG <index>
- 5: outgoing calls are barred
- 6: incoming calls are barred
- 7: CLIR suppression rejected

<code2>

- 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: all 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)

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| | |
|----------|--------------------------|
| <index> | Closed User Group index |
| <number> | String type phone number |
| <type> | Type of address |

10.15 Unstructured supplementary service data +CUSD

10.15.1 Description :

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 alphanumeric string, for display only, or for display plus request for the next sequence.

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

10.15.2 Syntax :

Command syntax : AT+CUSD = <n> [,<str> [<dcs>]]

Note : in case of enabled presentation, a +CUSD (as direct answer to a send USSD) is then indicated with :

+CUSD: <m> [,<str>,<dcs>]

10.15.3 Defined values :

<n>

- 0 : Disable the result code presentation
- 1 : Enable the result code presentation
- 2 : Cancel session (not applicable to read command response)

<m>

- 0: no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation)
- 1: further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)
- 2: USSD terminated by network
- 4: Operation not supported

<str>: network string (name), converted in the selected character set

<dc> : the data coding scheme received (GSM TS 03.38).

10.15.4 Syntax To send and receive USSD :

Command syntax: AT+CUSD= <n> [,<str> [,<dc>]]

Note : Please, be aware that the send USSD command needs the user to re-enter the <n> parameter !

10.15.5 Defined values To send and receive USSD :

<str> is the USSD string to be sent.

<dc> the default alphabet and the UCS2 alphabet are supported.

When the product sends a USSD, an OK response is first returned, and the intermediate +CUSD indication comes subsequently.

In case of error, a "+CUSD:4" indication is returned.

10.16 Closed user group +CCUG

10.16.1 Description :

The Closed User Group Supplementary Service enables subscribers to form 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. The +CCUG 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 or not 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.

10.16.2 Syntax :

Command syntax: AT+CCUG = <n> [,<index> [<info>]]

| Command | Possible responses |
|-----------|-----------------------|
| AT+CCUG? | " +CCUG: 1,1,0 OK" |
| AT+CCUG=? | "OK" |
| AT+CCUG=1 | "OK" |

10.16.3 Defined values :

<n>

0 : Disable CUG mode (default)
1 : Enable CUG mode

<index>

0-9: CUG index (0 default),
10: Preferred CUG

<info>

0: No information (default)
1: Suppress OA
2: Suppress preferential CUG
3: Suppress OA and preferential CUG

Remark : to activate the control of the CUG information by call, add [G] or [g] to the ATD command. In this case, index and info values will be used.

11 Data commands

11.1 Using AT Commands during a data connection

To use AT Commands during a data connection (e.g. while the product is in online mode), it is necessary either to switch to offline mode, or to use the **specific +WMUX** command to enable Commands / Data multiplexing.

11.1.1 Switch from online to offline mode

To switch from online mode to offline mode, the “+++” sequence must be sent. Following this, the product gets back to offline mode with an “OK” response, and a AT command can be sent.

Note : the “+++” sequence will only work with the +ICF command using one of the following settings:

- 8 data bits, with no parity
- 7 data bits, with even parity

11.1.2 Switch from offline to online mode

See the ATO command description.

11.2 Bearer type selection +CBST

11.2.1 Description :

This command applies to both **outgoing** and **incoming data calls**, but in a different way. For an outgoing call, the two parameters (e.g. **<speed>** and **<ce>**) are meaningful, whereas for an incoming call, only the **<ce>** parameter is used.

Note 1) For incoming calls, if **<ce>** is set to ‘T’ only and the network offers only ‘NT’ or vice versa, then the call is released.

Note 2) Values 2 and 3 for **<ce>** parameter are equivalent to former values 100 and 101. Those values are managed for compatibility purpose, but they shouldn’t be used in new code (2 as former 100, and 3 as former 101).

11.2.2 Syntax :

Command syntax: AT+CBST= <speed>, <name>, <ce>

| Command | Possible responses |
|---|--|
| AT+CBST=? Note : Test command | +CBST: (0-8,65,66,68,70,71),(0),(0-3) OK Note : Data 14,4 kbps not supported |
| AT+CBST=? Note : Test command | +CBST: (0 8,12,14,65,66,68,70,71,75),(0),(0-3) OK Note : Data 14,4 kbps supported |
| AT+CBST=7,0,1 Note : Ask for a bearer | OK Note : Bearer supported |
| AT+CBST? Note : Current values | +CBST:7,0,1 OK Note : Command valid |
| AT+CBST=81,0,0 Note : Ask for a bearer | +CME ERROR : 4 Note : Bearer not supported |

11.2.3 Defined values :**<speed>**

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(*): 1400 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)

(*)This speed configures data and fax 14.4 kbps bearers.

<name>

No data compression is provided and only asynchronous modem is supported :
 <name> = 0.

<ce> : Connection element

- 0: Transparent only
- 1(default) : Non transparent only
- 2: Transparent preferred
- 3: Non transparent preferred

11.4 Service reporting control +CR

11.4.1 Description :

This command enables a 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.

These report types are :

| | |
|----------------|----------------------------------|
| +CR: ASYNC | For asynchronous transparent |
| +CR: REL ASYNC | For asynchronous non-transparent |

11.4.2 Syntax :

Command syntax : AT+CR=<mode>

| Command | Possible responses |
|---|----------------------------|
| AT+CR=0 Note : Extended reports disabled | OK Note : Command valid |
| AT+CR=1 Note : Extended reports enabled | OK Note : Command valid |
| AT+CR? | +CR: 1 OK |
| AT+CR=? | +CR: (0,1) OK |

11.4.3 Defined values:

<mode>:

- 0: disable extended reports
- 1: enable extended reports

11.5 Cellular result codes +CRC

11.5.1 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 (e.g. +CRING: VOICE).

These extended indications are:

| | |
|-------------------|----------------------------------|
| +CRING: ASYNC | for asynchronous transparent |
| +CRING: REL ASYNC | for asynchronous non-transparent |
| +CRING: VOICE | for normal speech. |
| +CRING : FAX | for fax calls |

11.5.2 Syntax :

Command syntax : AT+CRC=<mode>

| Command | Possible responses |
|--|----------------------------|
| AT+CRC=0 Note : Extended reports disabled | OK Note : Command valid |
| AT+CRC=1 Note : Extended reports enabled | OK Note : Command valid |
| AT+CRC? | +CRC: 1 OK |
| AT+CRC=? | +CRC: (0,1) OK |

11.5.3 Defined values:

<mode>:

0: disable extended reports

1: enable extended reports

11.6 DTE-DCE local rate reporting +ILRR

11.6.1 Description :

This parameter controls whether the extended-format "+ILRR:<rate>" information text is transmitted from the DCE to the DTE or not. The <rate> value reported represents the current (negotiated or renegotiated) DTE-DCE speed rate.

If enabled, the intermediate result code is transmitted in an **incoming or outgoing data call**, after any data compression report, and before any final result code (CONNECT).

11.6.2 Syntax :

Command syntax : AT+ILRR = <value>

| Command | Possible responses |
|---|----------------------------|
| AT+ILRR=0 Note : Local port rate report disabled | OK Note : Command valid |
| AT+ILRR=1 Note : Local port rate report enabled | OK Note : Command valid |
| AT+ILRR? | +ILRR: 1 OK |
| AT+ILRR=? | +ILRR: (0,1) OK |

11.6.3 Defined values:

<value>:

0: disable local port rate report
1: enable local port rate report

<rate> can take the following values: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (kbps).

14 V24-V25 commands

14.1 Fixed DTE rate +IPR

14.1.1 Description :

This commands specifies the data rate at which the DCE will accept commands.

Notes :

- Autobauding is supported (operating from 1200 to 38400 baud).
- 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 desynchronised. 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.

14.1.2 Syntax :

Command syntax : AT+IPR=<n> or AT+IPR=<m>

| Command | Possible responses |
|------------------------|---|
| AT+IPR? Note : | +IPR: 9600 OK Note : Current rate is 9600 bps |
| AT+IPR=? Note : | +IPR: (300,600,1200,2400,4800,9600,19200,38400,57600),(115200) OK Note : Possible value (*) |
| AT+IPR=38400 Note : | OK Note : Disable autobauding and set rate to 38400 bps |
| AT+IPR=0 Note : | OK Note : Enable autobauding |

14.1.3 Defined values:

<n> : range of auto-detectable speeds (bauds)

- 0
- 2400
- 4800
- 9600
- 19200

<m>: possible speeds that can be used by the DCE (bauds)

- 300
- 600
- 1200
- 38400
- 57600
- 115200

14.2 DTE-DCE character framing +ICF

14.2.1 Description :

This command is used to determine the local serial port start-stop (asynchronous) character framing used by the DCE.

14.2.2 Syntax :

Command syntax: AT+ICF= <format>[, <parity>]

| Command | Possible responses |
|----------------------|---|
| AT+ICF? Note : | +ICF: 3,4 OK Note : Current values |
| AT+ICF=? Note : | +ICF: (1-6),(0-4) OK Note : Possible values |
| AT+ICF=2,0 Note : | OK Note : New values |

14.2.3 Defined values:

<format>

- 0 : Autodetect (not supported)
- 1 : 8 Data 2 Stop (supported)
 <parity>parameter is ignored.
- 2 : 8 Data 1 Parity 1 Stop (supported)
 if no<parity> provided, 3 is used by default as <parity>value.
- 3 : 8 Data 1 Stop (supported)
 <parity>parameter is ignored.
- 4 : 7 Data 2 Stop (supported)
 <parity>parameter is ignored.
- 5 : 7 Data 1 Parity 1 Stop (supported)
 if no<parity> provided, 3 is used by default as <parity>value.
- 6 : 7 Data 1 Stop (supported)
 <parity>parameter is ignored.

<parity>

- 0 : Odd (supported)
- 1 : Even (supported)
- 2 : Mark (supported)
- 3 : Space (supported)
- 4 : None (supported)

Notes :

- Setting a character framing different from 8N1 will disable autobauding if it was activated. Setting it back to 8N1 **will not** re-enable autobaud.

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- Setting the framing to 8N1 will let the autobauding enabled, if it was already enabled (implying framing was already 8N1).

14.3 DTE-DCE local flow control +IFC

14.3.1 Description :

This command is used to control the operation of local flow control between the DTE and DCE.

14.3.2 Syntax :

Command syntax : AT+IFC=<DCE_by_DTE>,<DTE_by_DCE>

| Command | Possible responses |
|----------------------|---|
| AT+IFC? Note : | +IFC: 2,2 OK Note : Current values |
| AT+IFC=? Note : | +IFC: (0,2),(0,2) OK Note : Possible values |
| AT+IFC=0,0 Note : | OK Note : New values |

14.3.3 Defined values :

< DCE_by_DTE >

- 0 : none (supported)
- 1 : Xon/Xoff local circuit 103 (not supported)
- 2 : RTS (supported)
- 3 : Xon/Xoff global on circuit 103 (not supported)

Important note:

when this parameter is set to 2 (DTE invokes flow control through RTS) DCE behaviour 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 behaviour allows the user to use the default settings (hardware flow control) and leave RTS disconnected. In the case where RTS is connected and is high at least once, it acts on the DCE.

< DTE_by_DCE >

- 0 : none (supported)
- 1 : Xon/Xoff circuit 104 (not supported)
- 2 : CTS (supported)

When this parameter is set to 0 (none) then CTS is kept high all the time.

14.4 Set DCD signal &C

14.4.1 Description :

This commands controls the Data Carrier Detect (DCD) signal.

14.4.2 Syntax :

Command syntax : AT&C<n>

| Command | Possible responses |
|--|----------------------------|
| AT&C0 Note : DCD always on | OK Note : Command valid |
| AT&C1 Note : DCD matches state of the remote modem's data carrier | OK Note : Command valid |

14.4.3 Defined values:

<n>

0 : DCD always on

1 : DCD matches state of the remote modem's data carrier

14.5 Set DTR signal &D

14.5.1 Description :

This commands controls the Data Terminal Ready (DTR) signal.

14.5.2 Syntax :

Command syntax : AT&D<n>

| Command | Possible 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 |

14.5.3 Defined values:

<n>

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

14.6 Set DSR signal &S

14.6.1 Description :

This commands controls the Data Set Ready (DSR) signal.

14.6.2 Syntax :

Command syntax : AT&S<n>

| Command | Possible responses |
|--|----------------------------|
| AT&S0 Note : DSR always on | OK Note : Command valid |
| AT&S1 Note : DSR off in command mode, DSR on in data mode | OK Note : Command valid |

14.6.3 Defined values:

<n>

0 : DSR always on

1 : DSR off in command mode, DSR on in data mode

14.7 Back to online mode O

14.7.1 Description

If a connection has been established and the ME is in command mode, this command allows you to return to online data mode.

14.7.2 Syntax

Command syntax : ATO

| Command | Possible responses |
|---|--------------------|
| ATO <i>Return from offline mode to online mode</i> | OK |

14.7.3 Defined values :

No parameter

14.8 Result code suppression Q

14.8.1 Description :

This command determines whether the mobile equipment sends result codes or not

14.8.2 Syntax :

Command syntax : ATQ<n>

| Command | Possible responses |
|--|----------------------------|
| ATQ0 Note : DCE transmits result codes | OK Note : Command valid |
| ATQ1 Note : Result codes are suppressed and not transmitted | Note : No response |

14.8.3 Defined values :

<n>

0 : DCE transmits result codes

1 : Result codes are suppressed and not transmitted

14.9 DCE response format V

14.9.1 Description :

This command determines whether the DCE response format uses or not the header characters <CR><LF>, and the result codes are provided as numeric or verbose.

14.9.2 Syntax :

Command syntax : ATV<n>

| Command | Possible 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 |

14.9.3 Defined values :

| | <n>=0 | <n>=1 |
|-----------------------|--------------------|------------------------------------|
| Information responses | <text><CR><LF> | <CR><LF> <text><CR><LF> |
| Result codes | <numeric code><CR> | <CR><LF> <verbose code><CR><LF> |

14.10 Default configuration Z**14.10.1 Description :**

This command restores the configuration profile. Any call is released.

14.10.2 Syntax :

Command syntax : ATZ

| Command | Possible responses |
|----------------------|-----------------------------------|
| ATZ <i>Note :</i> | Ok <i>Note : Command valid</i> |

14.10.3 Defined values :

No parameter

14.11 Save configuration &W**14.11.1 Description :**

This commands writes the active configuration to a non-volatile memory (EEPROM).
Description of the stored parameters is given in appendix Parameters storage (§ 19.10)

14.11.2 Syntax :

Command syntax : AT&W

| Command | Possible responses |
|--|-----------------------------------|
| AT&W <i>Note : Writes current configuration to EEPROM</i> | OK <i>Note : Command valid</i> |

14.11.3 Defined values :

No parameter

14.12 Auto-tests &T

14.12.1 Description :

This command allows to trigger various auto-tests.

14.12.2 Syntax :

Command syntax : AT&T<n>

| Command | Possible responses |
|---|--|
| AT&T0 Note : Perform software auto-tests | OK Note : No software problem detected, all checksums are correct |
| AT&T1 Note : Do the audio loop test (close) | OK Note : Command valid |
| AT&T2 Note : Stop the audio loop test (open) | OK Note : Command valid |

14.12.3 Defined values :

<n>

- 0 : Perform software auto-tests
The response will be OK if no software problem is detected (EEPROM, RAM and ROM checksums), otherwise a simple ERROR response is sent.
- 1 : Do the audio loop test (close)
This is used to validate the audio loop(microphone to speaker).
- 2 : Stop the audio loop test (open)
This is used to validate the audio loop(microphone to speaker).

14.13 Echo E

14.13.1 Description :

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

14.13.2 Syntax :

Command syntax : ATE<n>

| Command | Possible responses |
|--|--------------------|
| ATE0 Note : Characters are not echoed | OK Note : Done |
| ATE1 Note : Characters are echoed | OK Note : Done |

14.13.3 Defined values :

<n>

0 : Characters are not echoed

1 : Characters are echoed

14.14 Restore factory settings &F

14.14.1 Description :

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

It only restores the parameters that can be found in table 19.10 (Parameters storage) with AT&F column checked. Those parameters are restored in RAM and in E2P, overwriting the profile set with AT&W.

14.14.2 Syntax :

Command syntax : AT&F[<n>]

| Command | Possible responses |
|---|--------------------|
| AT&F Note : Ask for restoring the factory settings | OK Note : Done |
| AT&F0 Note : idem | OK Note : Done |

14.14.3 Defined values :

<n>

0 : restore factory setting
No other value supported

14.15 Display configuration &V

14.15.1 Description

This command is used to display the modem configuration.

14.15.2 Syntax :

Command syntax : AT&V<n>

The parameters displayed are the following :

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

| Command | Possible responses |
|--|--|
| AT&V <i>Note : Display active parameters in RAM</i> | 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:0,0 &C:1 &D:2 %C:0 +IPR:9600 +ICF:3,4 +IFC:2,2 OK <i>Note : Done</i> <i>For Echo the first value corresponds to Echo cancellation 1.</i> |

14.15.3 Defined values :

<n>

- 0 : Display the modem configuration in RAM. (default value if no parameter provided)
- 1 : Display the modem configuration in EEPROM.
- 2 : Display the modem factory configuration.

14.16 Request identification information |

14.16.1 Description :

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

14.16.2 Syntax :

Command syntax : ATI<n>

| Command | Possible responses |
|---|---|
| ATI0 Note : Manufacturer and model identifications | CENTEL MODEM 900P OK Note : GSM 900 MHz primary band |
| ATI3 Note : Revision identification | 440_09gm.Q2406A 1266500 020503 17:06 OK Note : Software release 4.40, generated on the 05 th of February 2003 |
| ATI6 Note : Modem data features | DATA RATES: AUTOBAUD,300,1200,1200/75,2400,480 0,9600,14400 DATA MODES : T/NT,ASYNCHRONOUS FAX CLASS 1,2 OK Note : Done |
| ATI7 Note : Modem voice features | SPEECH CODINGS: FR,EFR,HR OK Note : Done |

14.16.3 Defined values :

<n>

- 0 : Display manufacturer followed by model identification.
(equivalent to +CGMI and +CGMM).
 - 3 : Display revision identification
(equivalent to +CGMR).
 - 4 : Display modem configuration in RAM
(equivalent to &V0).
 - 5 : Display modem configuration in EEPROM
(equivalent to &V1).
 - 6 : Display modem data features.
Lists the supported data rates, data modes, and fax classes.
 - 7 : Display modem voice features.
- Other values : "OK" string is sent back.

14.17 Data / Commands Multiplexing +WMUX

14.17.1 Description

This specific command allows to manage the data / AT commands multiplexing mode. See appendix 19.13 for the Data / Commands multiplexing protocol description.

14.17.2 Syntax

Command syntax AT+WMUX=<mode>

| Command | Possible responses |
|--|---|
| AT+WMUX=? | +WMUX: (0-1) OK |
| AT+WMUX? | +WMUX: 0 OK Note : Data / Commands multiplexing disabled. |
| AT+WMUX=1 Note : Enable Data / Commands multiplexing. | OK |

14.17.3 Defined values

<mode>

0: Multiplexing disabled. When the product is online (data communication in progress), no AT command can be used (default).

1: Multiplexing enabled. Data flows and AT commands are multiplexed while in online mode (data communication in progress).

15 Specific AT commands

15.1 Cell environment description +CCED

15.1.1 Description :

This command can be used by the application to retrieve the parameters of the main cell and of up to six neighbouring cells.

There are two possible methods for the external application to ascertain these cell parameters :

- on request by the application or
- automatically by the product every 5 seconds.

Automatic mode is not supported during registration.

15.1.2 Syntax :

Command syntax: AT+CCED=<mode>[, <requested dump>]

| Command | Possible responses |
|--|---|
| AT+CCED=0 | +CCED: 208,20,0002,0418,37,706,24,,,0,,,0,208 ,20, 0006,989b,37,835,20,208,20,0002 ,02a9,37 ,831,12,208,20,0101,7966,34, 818,13,208,20,0006,9899,39,713,9,208 ,20, 0002 ,0a72,33,711,12,208,20,0101,03fb,36, 8 24,10,1 OK |
| AT+CCED=0,1 Note : Only Main cell request | +CCED: 208,20,0002,0418,37,706,25,,,0,,,0 OK |

15.1.3 Defined values :

<mode>

- 0 : One shot requested
- 1 : Automatic shots requested
- 2 : Stop automatic shots

<requested dump>

1 : Main Cell :

- **if the Cell Identity is available**
MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev, RxLev Full, RxLev Sub, RxQual, RxQual Full, RxQual Sub, Idle TS
- **if the Cell Identity is not available**
MCC, MNC, LAC, BSIC, BCCH Freq (absolute), RxLev, RxLev Full, RxLev Sub, RxQual, RxQual Full, RxQual Sub, Idle TS

2 : Neighbour1 to Neighbour6 :

- **if the Cell Identity is available**
MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev
- **if the Cell Identity is not available**
MCC, MNC, LAC,, BSIC, BCCH Freq (absolute), RxLev

4 : Timing Advance

Notes :

- Combination (addition of the values) of the requested dump is supported.
- Note that in idle mode, only RxLev measurements (on the main cell and on the neighbouring cells) are made. The value of these RxLev is set in the RxLev Full field for the main cell. The response will be:
+CCED :<value1>, ... , <valuen>
OK
- Where <value> is the ASCII string of the values (in decimal form except the LAC and CI values which are in hexadecimal form) of the parameters. If a field cannot be measured – or is meaningless – the parameter is not filled in (two consecutive commas are sent). If the <requested dump> parameter is not provided, the one of the last +CCED command (or 15 by default) will be used. Values of MCC/MNC are set to 0 in the case of “No service”.

15.2 Automatic RxLev indication +CCED

15.2.1 Description :

The CCED command has been extended to indicate the received signal strength indication (rssi) of the main cell. Its principle did not changed.

15.2.2 Syntax :

Command Syntax: AT+CCED=<mode>[, <requested dump>]

15.2.3 Defined values :

<mode>

0 : One shot requested
1 : Automatic shots requested
2 : Stop automatic shots

<requested dump>

8 : Main cell RSSI indications (RxLev), in a range from 0 to 31

Note :

- The response will be a +CSQ response and not a +CCED response. The 07.07 format for +CSQ is respected. The <ber> is not evaluated by this command, so the <ber> value will always be 99.
+CSQ :<rssi>, 99
OK
- When automatic shots are selected, this +CSQ response is sent every time the <rssi> measured by the product changes. Automatic shots are supported in idle mode and during communication.
- Combination (addition of the values) of the requested dump (1,2,4,8) are supported but the activation or deactivation of this flow (8) does not affect the other flows. Both +CCED and +CSQ responses may then be generated.
- If the <requested dump> parameter is absent, the last +CCED command parameter (or 15 by default) will be used.

15.3 General Indications +WIND

15.3.1 Description :

CENTEL has introduced a general mechanism to send unsolicited non-standardized indications to the application. These indications are:

- indication of a physical change on the SIM detect pin from the connector (meaning SIM inserted, SIM removed)
- indication during mobile originated call setup that the calling party is ringing.
- Indication of the availability of the product to receive AT commands after boot.

For each indication, a "bit flow" has to be indicated.

15.3.2 Syntax:

Command syntax: AT+WIND= <IndLevel >

| Command | Possible responses |
|--|--|
| AT+WIND? | +WIND: 0OK |
| AT+WIND=255 | OK |
| Note: The SIM has been removed | +WIND: 0 Note: The SIM presence pin has been detected as "SIM removed" |
| Note: The SIM has been inserted | +WIND: 1 Note: The SIM presence pin has been detected as "SIM inserted" |
| Note: The network service is available for an emergency call | +WIND: 7 |
| Note: The initialization has been completed | +WIND: 4 |

The AT+WIND? command is supported and indicates the <allowed bit flows>. AT+WIND settings are automatically stored in non volatile memory (EEPROM). This means the &W command does not need to be used and the selected flows are always activated after boot. Default value is 0: no flow activated, no indication. AT+WIND=? gives the possible value range (0-4095)

The unsolicited response will then be:

+WIND : <event> [,<idx>]

<idx>: Call identifier, defined in +CLCC command.

Or for event 10:

+WIND: <event>,<phonebook>,<status>,...,<phonebook>,<status>

Or for event 11:

+WIND: <event>,["<checksum of SM>"],["<checksum of FD>"],["<checksum of ON>"],["<checksum of SN>"],["<checksum of EN>"],["<checksum of LD>"]

15.3.3 Defined values :**<IndLevel>**

0 : no unsolicited "+WIND: <IndNb>" will occur (default value)

1 (bit 0) : Hardware SIM Insert / Remove indications (Rack open/close) or SIM presence after software reset

2 (bit 1) : Calling party alert indication

4 (bit 2) : Product is ready to process AT commands (except phonebooks, AOC, SMS), but still in emergency mode.

8 (bit 3) : the product is ready to process all AT commands, at the end of init or after swapping to ADN in case of FDN configuration

16 (bit 4) : a new call identifier has been created (after an ATD command, +CCWA indication)

32 (bit 5) : an active, held or waiting call has been released by network or other party

64 (bit 6) : Network service available indication

128 (bit 7) : Network lost indication

256 (bit 8) : Audio ON indication

512 (bit 9) : SIM Phonebooks reload status

1024 (bit 10) : Sim phonebooks checksum indication

2048 (bit 11) : Interruption indication (only if FTR_INT is activated)

Combination (addition of the values) is used to allow more than one indication

flow : $0 \leq \text{IndLevel} \leq 4095$

The response is OK if the values are in the previous range.

The supported events are: <event>

- 0 : The SIM presence pin has been detected as "SIM removed"
- 1 : The SIM presence pin has been detected as "SIM inserted"
- 2 : Calling party is alerting
- 3 : Product is ready to process AT commands (except phonebooks, AOC, SMS), at init or after AT+CFUN=1
- 4 : Product is ready to process all AT commands, end of phonebook init or swap (FDN to ADN)
- 5 : Call <idx> has been created (after ATD or +CCWA...)
- 6 : Call <idx> has been released, after a NO CARRIER, a +CSSU: 5 indication, or after the release of a call waiting
- 7 : The network service is available for an emergency call.
- 8 : The network is lost.
- 9 : Audio ON.
- 10 : Show reload status of each SIM phonebook after init phase (after Power-ON or SIM insertion).
- 11 : Show the checksum of SIM phonebooks after loading
- 12 : An interruption has occurred

Or for event 10:

<phonebook> : SIM phonebook

"SM"

"FD"

"ON"

"SN"

"EN"

<status> :

0 : Not Reloaded from SIM (no change since last init or SIM removal)

1 : Reloaded from SIM to internal memory (at least one entry has changed)

Or for event 11:

<checksum> : 128-bit "fingerprint" of the phonebook.

Note : If the service of the phonebook is not loaded or not present, the checksum is not displayed and two comas without checksum are displayed (,).

15.4 Analog digital converters measurements +ADC

15.4.1 Description:

This command gets the (DC level * 1024) of ADC A, ADC B, and possibly ADC C. These voltages are coded on 12 bits..

15.4.2 Syntax :

Command syntax : AT+ADC=<n>

Response syntax : +ADC: <ADCValA>,<ADCValB>[,<ADCValC>]

| Command | Possible responses |
|--|---|
| AT+ADC=? Note : Ask for the list of possible values | +ADC: (0-1) Note : possible values 0 or 1 |
| AT+ADC=0 Note : Select 2 converters (mode 0) | OK Note : 2 converters mode selected |
| AT+ADC? Note : Ask for the current values of converters in mode 0 | +ADC: 500,23 OK Note : Adc A, Adc B on 12 bits |
| AT+ADC=1 Note : Select 3 converters (mode 1) | OK Note : 3 converters mode selected |
| AT+ADC? Note : Ask for the current values of converters in mode 1 | +ADC: 712,23,23 OK Note: Adc A, Adc B, Adc C on 12 bits |

15.4.3 Defined values:

<n>

0 : Select 2 converters

1 : Select 3 converters

<ADCValA>

ADC A value, coded on 12 bits. The value returned includes the resistor bridge.

These values are updated every 10 seconds. Displayed on modes 0 and 1.

<ADCValB>

ADC B value, coded on 12 bits. Displayed on modes 0 and 1.

<ADCValC>

ADC C value, coded on 12 bits. Displayed only on mode 1.

15.5 Mobile Equipment event reporting +CMER

15.5.1 Description :

This command enables or disables sending of unsolicited result codes in the case of a key press.

15.5.2 Syntax :

Command Syntax: AT+CMER=<mode>,<keyp>,<disp>,<ind>,<bfr>

Response syntax (key press event report) : +CKEV : <key>, <press>

Response syntax (indicator event report) : +CIEV: <indresp>,<value>.

| Command | Possible responses |
|---|--|
| AT+CMER=,1 Note : Ask key press event report | OK |
| | +CKEV:12,1 +CKEV:12,0 Note : Key 12 has been pressed and released. |
| AT+CMER? | +CMER: 3,1,0,0,0 OK |

15.5.3 Defined values :

Important note : The parameters <mode>, <disp> and <bfr> are not handled.

<keyp> (keypad) :

0 : No keypad event reporting.

1 : Keypad event reporting are routed using unsolicited code. Only the key pressings not caused by +CKPD are indicated.

2 : Keypad event reporting are routed using unsolicited code. All key pressings are indicated.

Note: As AT software does not manage the emulation of key press, the values 1 and 2 lead to the same results.

<ind>

0 : no indicator event reporting

1 : indicator event reporting using unsolicited result code. Only the indicator events not caused by +CIND shall be indicated by the TA to the TE

2: indicator event reporting using unsolicited result code. All indicator events shall be directed from TA to TE

<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>

1: key press
0: key release

<indresp> : indicator order number (as specified for +CIND)

<value> : new value of the indicator

15.6 Indicator control +CIND

15.6.1 Description :

This command is used to set the values of ME indicators. If ME does not allow setting of indicators or ME is not currently reachable, an error code is returned.

15.6.2 Syntax :

Command Syntax: AT+CIND=[<ind>[,<ind>[,...]]]

Response syntax: +CIND: <descr>[,<descr>[,...]]

| Command | Possible responses |
|--|--|
| AT+CIND=[<ind>[,<ind>[,...]]] | +CME ERROR: <err> Note : ME not reachable |
| AT+CIND=[<ind>[,<ind>[,...]]] | OK |
| AT+CIND? Note: read ME indicators current values | +CIND: <descr>[,<descr>[,...]] OK |
| AT+CIND=? Note: read possible value for ME indicators | +CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1)) OK |

15.6.3 Defined values :

<ind>:

- 0: indicator is OFF or in state which can be identified as "OFF" state
- 1: indicator is ON or in a state that is more substantial than "OFF" state
- 2: this value is more substantial than 1, and so on.

Note: If the indicator is a simple ON/OFF style element, it has values 0 and 1.

<descr>:

- "battchg" : battery charge level (0 - 5)
- "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 MT (0 - 1)
 - 0 : memory locations are available
 - 1 : memory full

15.7 Mobile equipment control mode +CMEC

15.7.1 Description :

This command selects the equipment which operates ME keypad, writes to ME display and sets ME indicators. If operation mode is not allowed by the ME, +CME ERROR: <err> is returned

15.7.2 Syntax :

Command Syntax: AT+CMEC=[<keyp>[,<disp>[,<ind>]]]

Response syntax : +CMEC: <keyp>,<disp>,<ind>

| Command | Possible responses |
|-----------------------------------|---|
| AT+CMEC=[<keyp>[,<disp>[,<ind>]]] | +CME ERROR: <err> |
| AT+CMEC=[<keyp>[,<disp>[,<ind>]]] | OK |
| AT+CMEC? | +CMEC: 2,0,0 OK |
| AT+CMEC=? | +CMEC: (2),(0),(0) OK Note: no change allowed |

15.7.3 Defined values:

<keyp>:

- 0 : ME can be operated only through its keypad (execute command of +CKPD cannot be used)
- 1 : ME can be operated only from TE (with command +CKPD)
- 2 : ME can be operated from both ME keypad and TE

<disp>:

- 0 : only ME can write to its display (command +CDIS can only be used to read the display)
- 1 : only TE can write to ME display (with command +CDIS)
- 2 : ME display can be written by both ME and TE

<ind>:

- 0 : only ME can set the status of its indicators (command +CIND can only be used to read the indicators)
- 1 : only TE can set the status of ME indicators (with command +CIND)
- 2 : ME indicators can be set by both ME and TE

15.8 Read Language Preference +WLPR

15.8.1 Description :

Read a Language Preference value of EF-LP. The first indices should have the highest priority.

15.8.2 Syntax :

Command syntax: AT+WLPR=<index>

Response syntax: +WLPR: <value>

| Command | Possible responses |
|--|---|
| AT+WLPR? Note : Read command | +WLPR: 4 OK Note : Four language preferences are available in EF-LP |
| AT+WLPR=1 Note : Read first EF-LP index value | +WLPR: 5 OK Note : Language preference is 5 |

15.8.3 Defined values:**<index>**

offset in the available languages range (SIM dependant).

<value>

Exemple of values for language : (see 23038)

| <value> | Language |
|----------------------|-----------------|
| 0 | German |
| 1 | English |
| 2 | Italian |
| 3 | French |
| 4 | Spanish |
| 5 | Dutch |
| 6 | Swedish |
| 7 | Danish |
| 8 | Portuguese |
| 9 | Finnish |
| 10 | Norwegian |
| 11 | Greek |
| 12 | Turkish |
| 13 | Hungarian |
| 14 | Polish |
| 32 | Czech |
| 33 | Hebrew |
| 34 | Arabic |
| 35 | Russian |
| 36 | Icelandic |

15.9 Write Language Preference +WLPW

15.9.1 Description :

Write a Language Preference value in EF-LP

15.9.2 Syntax :

Command syntax: AT+WLPW=<index >,<value>

Response syntax: OK or +CME ERROR: <err>

| Command | Possible responses |
|---|---|
| AT+WLPW=1,5 <i>Note : Write Lang Pref equal to 5 in EF-LP with index 1</i> | OK <i>Note : EF-LP correctly updated</i> |

15.9.3 Defined values :

<index>:

offset in the available languages range (SIM dependant).

<value>

See <value> examples above.

15.10 Read GPIO value +WIOR

15.10.1 Description

Read the requested GPI or GPIO pin value.

- **Note** : by default (e.g. after a reset), the I/O ports configuration is set by the **+WIOM** command.
- This command is allowed only on a Gpio not allocated by an Open-AT embedded application or for bus operations.

15.10.2 Syntax

Command syntax: AT+WIOR=<index>

Response syntax: +WIOR: <value>

| Command | Possible responses |
|---|---|
| AT+WIOR=0 <i>Read I/O (number 0) value</i> | +WIOR: 0 OK <i>GPIO number 0 is reset</i> |

15.10.3 Defined values

<index>

Eight I/O ports are available. The <index> value is between 0 and 7.

<value>

0: I/O port number <index> is reset.

1: I/O port number <index> is set.

15.11 Write GPIO value +WIOW

15.11.1 Description

Set the requested GPO or GPIO pin value.

Note :

- by default (after a reset), the I/O ports configuration is set by the +WIOM command.
- This command is allowed only on a GPIO not allocated by the Open-AT embedded application or for bus operations.

15.11.2 Syntax

Command syntax: AT+WIOW=<index >,<value>

| Command | Possible responses |
|--|------------------------------------|
| AT+WIOW=2,0 <i>Reset I/O (number 2)</i> | OK <i>GPIO value is written</i> |

15.11.3 Defined values

<index>

Eight I/O ports are available. The <index> value is between 0 and 7.

<value>

- 0: I/O port number <index> is reset.
1: I/O port number <index> is set.

15.12 Input/Output Management +WIOM

15.12.1 Description

This **specific** command allows to set the default GPIOs configuration (input or output) after reset, and each GPIO default value (if set as an output) after reset.

Note :

- This command is allowed only on a GPIO not allocated by the Open-AT embedded application or for bus operations.

15.12.2 Syntax

Command Syntax AT+WIOM=[<GpioDir>],[<GpioVal>]

| Command | Possible responses |
|---|---|
| AT+WIOM? | +WIOM: 255,0 OK On reset, all GPIOs are set to 0, as an output. |
| AT+WIOM=? | +WIOM: (0-255),(0-255) OK Range allowed for the parameters. |
| AT+WIOM=254 Set GPIO 0 as an input, and all others as outputs. | OK |
| AT+WIOM=,128 Set GPIO8 (on P32X6 product) or GPO 3 (on Q24X6 product) default output value to 1. | OK |
| AT+WIOM? | +WIOM: 254,128 OK |

15.12.3 Defined values

<GpioDir> : Bit table parameter indicating each GPIO direction.

0 : input

1 : output (default value).

Default value : 255 (all GPIOs set as outputs).

<GpioVal> : Bit table parameter indicating each **output-configured GPIO value** (each bit gives the corresponding GPIO default value).

0 : reset (default value)

1 : set

Remark : the GPIOs set as inputs by the **<GpioDir>** parameter are not affected by the value set by the **<GpioVal>** parameter.

Notes :

- **<GpioDir>** bit values for GPI and GPO are ignored.

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- **<GpioVal>** bit values for GPI are ignored.
- Here is the corresponding table between Module GPIO Pin Names and parameters values (**<index>**) for AT commands:

| Param value for AT Commands | Wismo Quik Q24X3 Pin Names | Wismo Pac P32X3 Pin Names | Wismo Quik Q24X6 Pin Names | Wismo Pac P32X6 Pin Names |
|-----------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| 0 | GPIO 0 | GPIO 0 | GPIO 0 | GPIO 0 |
| 1 | GPO 1 | GPI | GPO 1 | GPI |
| 2 | GPO 2 | GPIO 2 | GPO 2 | GPIO 2 |
| 3 | GPI | GPIO 3 | GPI | GPIO 3 |
| 4 | GPIO 4 | GPIO 4 | GPIO 4 | GPIO 4 |
| 5 | GPIO 5 | GPIO 5 | GPIO 5 | GPIO 5 |
| 6 | (no GPIO affected) | (no GPIO affected) | GPO 0 | GPO 0 |
| 7 | (no GPIO affected) | (no GPIO affected) | GPO 3 | GPIO 8 |

15.13 Abort command +WAC

15.13.1 Description

This specific command allows SMS, SS and PLMN selection related commands to be aborted.

15.13.2 Syntax

Command syntax: AT+WAC

| Command Syntax | Return |
|----------------|--------|
| AT+WAC | |
| AT+WAC=? | OK |
| AT+WAC? | OK |

Example :

| Command | Possible responses |
|---|--|
| AT+COPS=? Note : Available PLMN | |
| AT+WAC Note : Abort the request of PLMN list | OK Note : PLMN list request aborted |

15.13.3 Defined values :

No parameter

15.14 Play tone +WTONE

15.14.1 Description :

This specific command allows a tone to be played on the current speaker or on the buzzer. Frequency, gain and duration can be specified.

15.14.2 Syntax :

Command syntax: AT+WTONE=<mode>[,<dest>,<freq>,<gain>,<duration>]

Response syntax: OK or +CME ERROR: <err>

| Command | Possible responses |
|---|--------------------|
| AT+WTONE=1,1,300,9,50 Note : Play a tone | OK Note : Done |
| AT+WTONE=0 Note : Stop playing | OK Note : Done |
| AT+WTONE=? Note : Test command | OK Note : Done |
| AT+WTONE? Note : Current value | ERROR Note : |

15.14.3 Defined values :

<mode>

0: Stop playing.
1: Play a tone

<dest>: This parameter sets the destination (mandatory if <mode>=1)

1: Speaker
2: Buzzer

<freq> : This parameter sets tone frequency (in Hz) (mandatory if <mode>=1).

If **<dest>** = 1 (speaker), range is 1 Hz to 3999 Hz.

If **<dest>** = 2 (buzzer), range is **1 Hz to 3999 Hz**.

<gain> : This parameter sets the tone gain. The default value is 9.
Range of values is 0 to 15.

| <gain> | Speaker (db) | Buzzer (db) |
|---------------------|---------------------|--------------------|
| 0 | 0 | -0.25 |
| 1 | -0.5 | -0.5 |
| 2 | -1 | -1 |
| 3 | -1.5 | -1.5 |
| 4 | -2 | -2 |
| 5 | -3 | -3 |
| 6 | -6 | -6 |
| 7 | -9 | -9 |
| 8 | -12 | -12 |
| 9 | -15 | -15 |
| 10 | -18 | -18 |
| 11 | -24 | -24 |
| 12 | -30 | -30 |
| 13 | -36 | -40 |
| 14 | -42 | -infinite |
| 15 | -infinite | -infinite |

<duration>: This parameter sets tone duration (in unit of 100 ms).
Range of values is 0 to 50 (0 is default value, 1 -> 0,1 s., 50 -> 5 s.)

Remark : when **<duration>** = 0, the duration is infinite, and the tone should be stopped by AT+WTONE=0.

15.15 Play DTMF tone +WDTMF

15.15.1 Description :

This **specific** command allows a DTMF tone to be played on the current speaker. DTMF, gain and duration can be specified.

Remark : This command is only used to play a DTMF tone. To send a DTMF over the GSM network, use the +VTS command.

15.15.2 Syntax :

Command syntax: AT+WDTMF=<mode>[,<dtmf>,<gain>,<duration>]

Response syntax: OK or +CME ERROR: <err>

| Command | Possible responses |
|--|--|
| AT+WDTMF=1,"*",9,50 Note : Play a DTMF tone | OK Note : Done |
| AT+WDTMF=0 Note : Stop playing | OK Note : Done |
| AT+WDTMF=? Note : Test command | +WDTMF: (0-1),(0-9,*,#),(0-15),(0-50) OK Note : Done |
| AT+WDTMF? Note : Current value | ERROR Note : |

15.15.3 Defined values :

<mode>

0: Stop playing.

1: Play a DTMF tone

<dtmf> : This parameter sets the DTMF to play (mandatory if <mode>=1).

Value must be in {0-9,*,#}

<gain>: This parameter sets tone gain. The values are identical to those of the +WTONE (speaker) command. The default value is 9.

Range of values is 0 to 15 (see array on § 15.14.3)

<duration>: This parameter sets the tone duration (in unit of 100 ms).

Range of values is 0 to 50 (0 is default value, 1 -> 0,1 s., 50 -> 5 s.)

Remark : when **<duration>** = 0, the duration is infinite, and the DTMF tone can be stopped by AT+WDTMF=0.

15.16 CENTEL Downloading +WDWL

15.16.1 Description :

This specific command switches the product to download mode. Downloading is performed using the 1K-XMODEM protocol.

15.16.2 Syntax :

Command syntax: AT+WDWL

| Command | Possible responses |
|---|--|
| AT+WDWL Note : Switch on downloading mode | +WDWL: 0 Note : Start the downloading |
| | ... |
| | Note : Downloading in progress |
| | AT+CFUN=1 Note : Reset the product at the end |
| | OK Note : reset completed, new software running |

15.16.3 Defined values :

No parameter

15.17 CENTEL Voice Rate +WVR

15.17.1 Description :

This specific command allows the voice rate for bearer voice to be configured (available for outgoing calls only).

15.17.2 Syntax :

Command syntax : AT+WVR=<n>

| Command Syntax | Return |
|----------------|---|
| AT+WVR=? | +WVR: (0,2,3) Note : Half Rate available. |
| AT+WVR=? | +WVR: (0,1) Note : If EFR available. |
| AT+WVR=? | +WVR: (0) Note : If HR and EFR not available |
| AT+WVR=? | +WVR: (0-5) Note : If HR and EFR available |
| AT+WVR? | +WVR: <n> |

| Command | Possible responses |
|--|--------------------------------------|
| AT+WVR=1 Note : Configure voice type FR and EFR | OK Note : Bearer is configured |
| AT+WVR=6 Syntax error | +CME ERROR: 3 Note : Syntax error |
| AT+WVR? Note : Ask for the current value | +WVR: 1 OK |

15.17.3 Defined values :

<n> : Voice coding type.

0: FR

1: FR and EFR

2: FR, HR with HR preferred

3: HR, FR with FR preferred

4: EFR,HR with HR preferred

5: HR,EFR with EFR preferred.

15.18 Data Rate +WDR

15.18.1 Description :

This specific command allows the data rate for bearer data to be configured (available for outgoing calls only).

15.18.2 Syntax :

Command syntax : AT+WDR=<n>

| Command Syntax | Return |
|----------------|---|
| AT+WDR=<n> | OK |
| AT+WDR=? | +WDR: (0-2) Note : If Half Rate available. |
| AT+WDR=? | +WDR: (0) Note : If Half Rate not available. |
| AT+WDR? | +WDR: <n> |

| Command | Possible responses |
|--|-----------------------------------|
| AT+WDR=1 Note : Configure voice type FR,HR with HR preferred. | OK Note : Bearer is configured |
| AT+WDR=3 Syntax error | +CME ERROR: 3 Note : |
| AT+WDR? Note : Ask the current value | +WDR: 1 OK Note : |

15.18.3 Defined values :

<n>: Data coding type.

0: FR

1: FR, HR with HR preferred

2: HR, FR with FR preferred

15.19 Hardware Version +WHWV

15.19.1 Description :

This specific command gets the hardware version.

15.19.2 Syntax :

Command syntax : AT+WHWV

| Command | Possible responses |
|--|--|
| AT+WHWV Note : Request Hardware Version | Hardware Version 4.14 OK Note : Hardware version is 4.14 |
| AT+WHWV Note : Request Hardware Version | Hardware Version --- OK Note : No hardware version available |

15.19.3 Defined values :

No parameter

15.20 Date of Production +WDOP

15.20.1 Description :

This specific command gets the date of production. Format of the date is Week/Year (ww/yyyy).

15.20.2 Syntax :

Command syntax : AT+WDOP

| Command | Possible responses |
|--|--|
| AT+WDOP Note : Request Date of Production | Production date (W/Y): 01/2000 OK Note : Date of production is WEEK: 01 / YEAR: 2000(1 st week of year 2000) |
| AT+WDOP Note : Request Date of Production | Production date (W/Y): --/---- OK Note : No date of production available |

15.20.3 Defined values :

No parameter

15.21 CENTEL Select Voice Gain +WSVG

15.21.1 Description :

The product has 2 voice gain controllers, this specific command selects the microphone gain controller.

15.21.2 Syntax :

Command syntax : AT+WSVG = <n>

| Command | Possible responses |
|---|---|
| AT+WSVG=<n> | |
| AT+WSVG=0 Note : Select Controller 1 (Default) | OK Note : Controller 1 selected |
| AT+WSVG=1 Note : Select Controller 2 (Default) | OK Note : Controller 2 selected |
| AT+WSVG=? Note : Get the list of possible values | +WSVG: (0-1) Note : possible values 0 or 1 |
| AT+WSVG? Note : Get the current value | +WSVG: 1 Note : Controller 1 is selected |

15.21.3 Defined values

<n> Controller
0 : Controller 1 (Default)
1 : Controller 2

15.22 CENTEL Status Request +WSTR

15.22.1 Description :

This **specific** command returns some operation status. It can be used for example to check the state of the initialisation sequence; the different values returned are Not started, Ongoing, Finished.

15.22.2 Syntax :

Command syntax: AT+WSTR=<status>

Response syntax: +WSTR: <status>,<value>

| Command | Possible responses |
|--|---|
| AT+WSTR=<status> | +WSTR :<status>,<value> |
| AT+WSTR=1 Note : Select the status 1 (INIT SEQUENCE) | +WSTR: 1,2 OK Note : Init finished |
| AT+WSTR=2 Note : Select the status 2 (NETWORK STATUS) | +WSTR: 2,1 OK Note : The network is available |
| AT+WSTR=? Note : Ask for the list of possible values | +WSTR: (1-2) Note : possible values : 1 and 2 |

15.22.3 Defined values

<status>

1 : Initialisation sequence

<value>

0 : Not started
1 : On going
2 : Finished

2 : Network status

<value>

0 : No network
1 : Network available

15.23 CENTEL Scan +WSCAN

15.23.1 Description :

This specific command displays the received signal strength indication (<rss>) for a specified frequency (in absolute format). This command is not allowed during communication.

15.23.2 Syntax :

Command syntax: AT+WSCAN=<absolute frequency>

Response syntax: +WSCAN: <rss>

| Command | Possible responses |
|--|---|
| AT+WSCAN=50 Note : Request <rss> of absolute frequency 50 | +WSCAN: 23 OK Note : <rss> is 23. |
| AT+WSCAN=1025 Note : Request power of absolute frequency 1025 | CME ERROR: 3 Note : 1025 is not a valid absolute frequency |

15.23.3 Defined values

<absolute frequency> : frequency in absolute format<rss>

0 : -113 dBm or less

1 : -111 dBm

2-30 : -109 to -53 dBm

31 : -51dBm or more

99 : not known or not detectable

15.24 CENTEL Ring Indicator Mode +WRIM

15.24.1 Description :

This specific command sets the state of the Ring Indicator Mode.

- In pulse RI mode : an electrical pulse is sent on the Ring Indicator signal just before sending any unsolicited AT response, in order to lose no AT responses when client tasks are in sleep state. Still in RI mode, when receiving incoming calls, electrical pulses are sent on the RI signal.
- In up-down RI mode : no pulses are sent before unsolicited AT response. Up-down signals are sent when receiving an incoming call.

15.24.2 Syntax :

Command syntax: AT+WRIM=<n>

| Command | Possible responses |
|---|---|
| AT+WRIM=<n> | OK |
| AT+WRIM=0 Note : Select up-down RI mode | OK Note : up-down RI mode selected |
| AT+WRIM=1 Note : Select pulse RI mode | OK Note : pulse RI mode selected |
| AT+WRIM=? Note : Ask for the list of possible values | +WRIM: (0-1) OK Note : possible values 0 or 1 |
| AT+WRIM? Note : Ask for the current value | +WRIM: 1 OK Note : current RI mode is pulse RI. |

15.24.3 Defined values

<n>

0 : up-down RI mode

1 : pulse RI mode

15.25 CENTEL 32kHz Power down Mode +W32K

15.25.1 Description :

This specific command allows the 32kHz power down mode to be enabled or disabled.

Note :

- When power down mode is entered, the product uses a 32kHz internal clock during inactivity stages (despite of its nominal internal clock).
- When enabled, power down mode is active after 1 to 15 minutes. The mode is not stored in EEPROM : the command has to be repeated after a reset.

15.25.2 Syntax :

Command syntax : AT+W32K=<mode>

| Command | Possible responses |
|---|--|
| AT+W32K=1 Note : Enable 32kHz power down mode | OK Note : 32kHz power down mode is enabled |
| AT+W32K=0 Note : Disable 32kHz power down mode | OK Note : 32kHz power down mode is disabled |

15.25.3 Defined values

<mode> :

- 0 : Disable 32kHz power down mode
1 : Enable 32kHz power down mode

15.26 CENTEL Change Default Melody +WCDM

15.26.1 Description :

This specific command allows the selection of a manufacturer specific melody.. This default melody will be played for any new incoming voice call, either on the buzzer or on the speaker.

15.26.2 Syntax :

Command syntax : AT+WCDM=<melody>,<player>

| Command | Possible responses |
|--|---|
| AT+WCDM=0 Note : Select no melody | OK |
| AT+WCDM=5 Note : Select melody n° 5 | OK |
| AT+WCDM? Note : Indicate the current melody | +WCDM: 5,0 OK Note : Melody n° 5 is currently selected, and the buzzer is selected to play it. |
| | RING Note : An incoming call occurs, and the melody n° 5 is played on the buzzer. |
| AT+WCDM=,1 Note : Select the speaker to play the melody on. | OK |
| AT+WCDM? | +WCDM: 5,1 OK Note : Now the speaker is selected to play the melody if an incoming call occurs. |

15.26.3 Defined values

<melody>

0 : No melody (default)
1 - 10 : Melody 1 to 10

<player>

0 : Melody n° <melody> will be played on the buzzer for any new incoming voice call. (default)
1 : Melody n° <melody> will be played on the speaker for any new incoming voice call.

15.27 CENTEL Software version +WSSW

15.27.1 Description :

This specific command displays some internal software reference.

15.27.2 Syntax :

Command syntax : AT+WSSW

| Command | Possible responses |
|---|---|
| AT+WSSW <i>Note : Get Software version</i> | A00_00gm.2c 000000008F5DC6EA OK <i>Note : internal software information</i> |

15.27.3 Defined values :

No parameter

15.28 CENTEL Custom Character Set +WCCS

15.28.1 Description :

This specific command allows to edit and display the custom character set tables. These tables are used by the "CUSTOM" mode of +CSCS and the +WPCS commands. In this CUSTOM mode, when the user enters a string, it is converted into GSM alphabet using the Custom To GSM table. In a similar way, when the user requests a string display, the string is converted from GSM alphabet using the GSM To Custom table.

In edition mode, the session is terminated by <ctrl-Z>, or aborted by <ESC>. Only hexadecimal characters ('0'...'9', 'A'...'F') can be used. The number of characters entered must be equal to the edition range requested, otherwise the command will return "+CME ERROR: 3".

15.28.2 Syntax :

Command syntax : AT+WCCS=<mode>,<table>,<char 1>[,<char 2>]

| Command | Possible responses |
|---|---|
| AT+WCCS=0,0,120,130 Note : Display from character 120 to character 130 of the Custom To GSM conversion table | +WCCS: 11, 78797A2020202020097E05 OK Note : 11characters displayed |
| AT+WCCS=1,0,115<CR> 20<ctrl-Z> Note : Edit character 115 of the Custom To GSM conversion table | OK Note : Edition successful |
| AT+WCCS=1,1,0,4<CR> 40A324A5E8<ctrl-Z> Note : Edit the 5 first characters of the GSM To Custom conversion table | OK Note : Edition successful |
| AT+WCCS=1,1,200 Note : Edit character 200 of GSM To Custom conversion table | +CME ERROR: 3 Note : Index out of range |

15.28.3 Defined values

<mode>

0 : Display the table
1 : Edit the table

<table>

0 : Custom To GSM conversion table
1 : GSM To Custom conversion table

<char 1>, <char 2> : Character range to display/edit.

0-127 : for GSM To Custom conversion table

0-255 : for Custom To GSM conversion table

Note : If only <char 1> is provided, only this char is displayed/edited.
See section 19.2 for informative examples on phonebooks.

15.29 CENTEL LoCK +WLCK

15.29.1 Description :

This specific command allows the ME to be locked on a specific network operator.

Note: Test SIM cards (with MCC=001 & MNC=01) doesn't check these locks.

15.29.2 Syntax :

Command syntax: AT+WLCK=<fac>,<passwd>,<NetId>[,<GID1>[,<GID2>]]
[,<CnIType>[,<CnIData>]]

Response syntax: +WLCK: <status>

| Command | Possible responses |
|--|---|
| AT+WLCK="PN",12345678,20810 Note : Activate network lock on SFR (208,10) | OK Note : Network lockactivated |
| AT+WLCK="PS",12345678,208105923568974 Note : Activate SIM lock | OK Note : SIM lock activated |
| AT+WLCK="PU",12345678,2081035 Note : Activate Network Subset lock on SFR (208, 10, 35). | OK Note : Network Subset lock activated |
| AT+WLCK="PU",12345678,20810 | +CME ERROR: 3 Note: Need 7 digits of IMSI to perform a service provider lock |
| AT+WLCK="PP",12345678,20810,"E5" Note : Activate Service Provider lock on SFR (208, 10) and GID1 (0xE5). | OK Note : Service Provider lock activated. |
| AT+WLCK="PC",12345678,20810,"E5","10" Note : Activate Corporate lock on SFR(208, 10), GID1 (0xE5)and GID2 (0x10). | OK Note : Corporate lock activated. |
| AT+WLCK="PN",12345678,20810,0 Note : Activate Network lock on SFR (208, 10) using co-operative network list from SIM file EFCNL (must be present in SIM) | OK Note : Network lockactivated on SFR and co-operative network list present inSIM |
| AT+WLCK="PN",12345678,20801,1,"02F802FFFFFF02F801FFFFFF" Note : Activate Network lock on F ORANGE (208, 01) withmanual co-operative network list including SFR (208, 10) and Bouygues Telecom (208, 20) | OK Note : Network lockactivated on F ORANGE (primary network), SFR and Bouygues Telecom (co-operative networks) |

15.29.3 Defined values :**<fac> :**

"PS" : SIM lock facility with a 8 digits password (PCK).

"PN" : Network lock with a 8 digits password (NCK).

"PU" : Network subset lock with a 8 digits password (NSCK).

"PP" : Service provider lock with a 8 digits password (SPCK).

"PC" : Corporate lock with a 8 digits password (CCK).

<CnlType> : Type of lock for cooperative network list (CNL)

0 : Automatic (co-operative network list retrieved from EFCNL SIM file)

Note : EFCNL file must be present in SIM to use automatic mode.

1 : Manual (cooperative network list is given in the <CnlData> parameter)

<CnlData> : Co-operative network list (hexa string type) using same format as in EFCNL SIM file (ETSI GSM 11.11 or 3GPP 04.08).

Note : Only if <CnlType>= 1

15.30 CPHS command: +CPHS

15.30.1 Description

This **specific** command is used to activate, deactivate or interrogate a CPHS feature (e.g. Voice Mail Indicator, Mail Box Number...)

Note : This command may answer +CME ERROR: 3 if the CPHS feature is disabled (cf. +WFM command), or if the SIM card does not support this CPHS feature.

15.30.2 Syntax

Command syntax : AT+CPHS=<Mode>,<Fctld>[,<precision>]

| Command | Possible responses |
|--------------------------------------|---|
| AT+CPHS=<Mode>,<Fctld>[,<precision>] | OK |
| AT+CPHS=<Mode>,<Fctld>[,<precision>] | +CME ERROR: 3 |
| AT+CPHS? | +CPHS: <Fctld1>,<Status><CR<LF> +CPHS: <Fctld2>,<Status><CR<LF> ... +CPHS: <Fctldn>,<Status><CR<LF> |
| AT+CPHS=? | OK |

15.30.3 Defined values:

<Mode>

- 0 : Deactivate a CPHS feature
- 1 : Activate a CPHS feature
- 2 : Interrogate a CPHS status

Note : The deactivate or activate command has not effect for Alternate line service, Network Operator Name, CPHS information and Customer Profile Service features.

<Fctld>

- 1 : Voice Mail Indicator
- 2 : Mail Box Number
- 3 : Alternate Line Service
- 4 : Diverted Call Indicator
- 5 : Network Operator Name
- 6 : CPHS Information
- 7 : Customer Service Profile

Note : The Customer Service Profile and Alternate Line Service features are activated if the field is set in CPHS information and CSP files. The Network Operator Name is activated if at least one of the two format names exist (Long or Short format). This is done at initialization.

<precision> :

only used if <Mode>=2 and <FctId>= 5 to 7
 if <FctId>=5, this field is <type format> (See +WNON)
 if <FctId>=6, this field is <data field> (See +WCPI)
 if <FctId>=7, this field is <service> (See +WCSP)

<Status>

0 : CPHS feature disabled
 1 : CPHS feature enabled

15.30.4 Examples

```

AT+CPHS?                Interrogate the status of CPHS functionality
+CPHS: 1,0              The voice mail indicator functionality is deactivated
+CPHS: 2,0              The mail box number functionality is deactivated
+CPHS: 3,1              The Alternate Line Service functionality is activated
+CPHS: 4,0              The Divert Call Indicator functionality is deactivated
+CPHS: 5,1              The Network Operator Name functionality is activated
+CPHS: 6,1              The CPHS Information functionality is activated
+CPHS: 7,1              The Customer Service Profile functionality is activated
OK

AT+CPHS=3,1             Syntax error
+CME ERROR: 3

AT+CPHS=1,1             Activate the voice mail indicator functionality
OK

AT+ CPHS?               Interrogate the status of CPHS functionality
+CPHS: 1, 1             The voice mail indicator functionality is activated
+CPHS: 2, 0             The mail box number functionality is deactivated
+CPHS: 3, 1             The Alternate Line Service functionality is activated
+CPHS: 4, 0             The Divert Call Indicator functionality is deactivated
+CPHS: 5, 1             The Network Operator Name functionality is activated
+CPHS: 6, 1             The CPHS Information functionality is activated
+CPHS: 7, 1             The Customer Service Profile functionality is activated
OK

**** the message box contains 1 message ****
+WVMI: 1, 1             A message is waiting on Line 1
**** The message box contains a second message ***
+WVMI: 2, 1             A message is waiting on Line 2

AT+ CPHS=1, 4           Activate the divert call indicator functionality
OK

```

**** the call forwarding is active on Line 1 ****

+WDCI: 1,1 Call forwarding is activated on Line 1

AT+CPHS=2,1 Interrogate the status of voice mail indicator functionality

+WVMI: 1, 1 a message is waiting on LINE 1

+WVMI: 2, 1 a message is waiting on LINE 2

+WVMI: 3, 0 no Data waiting

+WVMI: 4, 0 no Fax waiting

OK

AT+CPHS=1,2 Activate the mail box number functionality

OK

AT+WALS=1 Interrogate the status of activated Line

+WALS: 2 The current line is number 2

OK

AT+CPHS=0,4 Deactivate the divert call indicator functionality

OK

AT+CPHS? Interrogate the status of CPHS functionality

+CPHS: 1, 1 The voice mail indicator functionality is activated

+CPHS: 2, 1 The mail box number functionality is activated

+CPHS: 3, 1 The Alternate Line Service functionality is activated

+CPHS: 4, 0 The Divert Call Indicator functionality is deactivated

+CPHS: 5, 1 The Network Operator Name functionality is activated

+CPHS: 6, 1 The CPHS Information functionality is activated

+CPHS: 7, 1 The Customer Service Profile functionality is activated

OK

AT+CPHS=2,2 Query current mail box numbers in SIM

+WMBN: 1," 19254 871 23 4",129,, 1 Mail box number for Line 1

+WMBN:2,,, 1 Mail box number for Line 2

+WMBN:3,,, 1 Mail box number for Data Line

+WMBN:4,,, 1 Mail box number for Fax Line

OK Only Line1 can be updated

15.31 Unsolicited result : CENTEL Voice Mail Indicator : +WVMI

15.31.1 Description

This unsolicited indication gives the status of the LINE 1, LINE 2, DATA or FAX mailboxes. The +CPHS command can be used to know the status of voice mail indicator for each line.

15.31.2 Syntax

Response syntax : +WVMI: <LineId>,<Status>

Response syntax (to AT+CPHS=2,1)

+WVMI = <LineId>,<Status>

| Command | Possible responses |
|--|---|
| AT+CPHS=1,1 Note : Activate the Voice Mail indicator feature. | OK |
| AT+CPHS=2,1 Note :Get the current status of Voice mail indicator. | +WVMI: 1,1 a message is waiting on LINE 1 +WVMI: 2,1 a message is waiting on LINE 2 +WVMI: 3,0 no Data waiting +WVMI: 4,0 no Fax waiting |
| AT+CPHS=2,1 | +CME ERROR: 3 Note :CPHS Feature is not allowed |
| AT+CPHS=1,1 Note :Activation of Voice mail indicator feature. | OK Note :The Voice mail indicator feature is activated |
| | +WVMI: 1,1 Note :A message is waiting on Line 1 |

15.31.3 Defined values

<LineId>

1 : Line 1
2 : Line 2
3 : Data
4 : Fax

<Status>

0 : No message waiting.
1 : At least one message is waiting

15.32 Unsolicited result : CENTEL diverted call indicator: +WDCI

15.32.1 Description

This indication provides the call forwarding flags. The +CPHS command can be used to know the status of Divert call indicator for each line.

15.32.2 Syntax

Response syntax: +WDCI:<Lineld>,<flag>

Response syntax (to AT+CPHS=2,4)

+WDCI = <Lineld>,<Status>

| Command | Possible responses |
|--|--|
| AT+CPHS=1,4 Note :Activate the Divert Call indicator feature. | OK |
| AT+CPHS=2,4 Note :Get the current status of Divert call indicator. | +WDCI: 1,1 divert call indicator is active on LINE 1 +WDCI: 2,1 divert call indicator is active on LINE 2 +WDCI: 3,0 divert call indicator is deactivate on Data +WDCI: 4,1 divert call indicator is active on Fax |
| AT+CPHS=2,4 | +CME ERROR: 3 Note :CPHS Feature is not allowed |
| AT+CPHS=1,4 Note :Activationof Divert call indicator feature. | OK Note :The Divert call indicator feature is activated |
| | +WDCI: 1,1 Note :Call forwarding is activate on Line 1 |

15.32.3 Defined values

<Lineld>

- 1 : Line 1
- 2 : Line 2
- 3 : Data
- 4 : Fax

<flag>, <status>

- 0 : Call forwarding is deactivated
- 1 : Call forwarding is activated

Note : The call forwarding SS is set by the AT+CCFC command.

15.33 CENTEL network operator name: +WNON

15.33.1 Description

This indication provides the name of the network operator (as a character string). This command is the response to the AT+CPHS=2,5[,<type format>] command.

15.33.2 Syntax

Command : AT+CPHS=2,5[,<type format>]

Response syntax : +WNON:<type format>,<operator name>

| Command | Possible responses |
|---|--|
| AT+CPHS=2,5 Note :Get the operator name | +WNON: 0,"Orange F" OK |
| AT+CPHS=2,5,1 Note :Get the short format operator name. | +WNON: 1,"Orange" OK |
| AT+CPHS=2,5,0 | +CME ERROR: 3 Note :When CPHS Feature is not allowed or format name no accessible |
| AT+CPHS=2,5,1 | +CME ERROR: 3 Note :When NON Feature is not allowed or format name no accessible |
| AT+CPHS=0,5 Note :Deactivation of Network Operator Name feature. | OK Note :No effect. |

15.33.3 Defined values

<type format>

- 0 : Long format operator name
- 1 : Short format operator name (default value)

<operator name>

The name of the operator, in long or short format

15.34 CENTEL CPHS information: +WCPI

15.34.1 Description

This indication provide CPHS information; ie. which data field are present in the SIM. This command is the response to the AT+CPHS 2,6[,<data field>] command.

15.34.2 Syntax

Command : AT+CPHS=2,6[,<data field >]

Response syntax : +WCPI: <data field>,<status>

| Command | Possible responses |
|---|---|
| AT+CPHS=2,6 Note :Get the current status for all CPHS info field | +WCPI: 0,"0033000F" OK |
| AT+CPHS=2,6,13 Note :Get the current status for Call Forward Activated indicator for Line 1. | +WCPI: 13,1 OK Note :Call Forward is active for Line 1. |
| AT+CPHS=2,6,22 Note :Get the current status for Line 2 Mailbox number. | +WCPI: 22,0 OK Note :Mailbox number for Line2 is not available. |
| AT+CPHS=2,6,17 | +CME ERROR: 3 Wrong data field |
| AT+CPHS=2,6,22 Note :Get the current status for Line 2 Mailbox number. | +CME ERROR: 3 Note :CPHS Feature is not allowed |
| AT+CPHS=0,6 Note :Deactivation of CPHS Info feature. | OK Note :No effect. |

15.34.3 Defined values

<data field> : value indicating the field of CPHS information (see appendix 19.14)

If **<precision>** field omitted in the AT+CPHS command, all field of CPHS Info will be displayed.

<status>

0 : data field is set

1 : data field is unset

When all CPHS information are requested, the status correspond to a bit field (see appendix 19.14)

Note : The field CSP service (<data field> = 1) is used to set or not the CSP feature at the initialisation.

15.35 CENTEL customer service profile: +WCSP

15.35.1 Description

This indication indicates if a service is accessible to the customer. This is the response to the AT+CPHS 2,7,<service > command.

15.35.2 Syntax

Command : AT+CPHS=2,7,<service>

Response syntax: +WCSP: <service>,<status>

| Command | Possible responses |
|--|--|
| AT+WCSP=? | ERROR |
| AT+WCSP? | ERROR |
| AT+CPHS=2,7 | +CME ERROR: 3 Note :Syntax error |
| AT+CPHS=2,7,9 Note :Get the current status for Barring of All Outgoing Calls. | +WCSP: 9,1 OK Note : Barring of All Outgoing Calls is customer accessible. |
| AT+CPHS=2,7,11 Note :Get the current status Barring of Outgoing International Calls | +WCSP: 11,1 OK Note :Barring of Outgoing International Calls is customer accessible. |
| AT+CPHS=2,7,2 Note :Get the current status Call forwarding on user Busy. | +CME ERROR: 3 Note :CPHS Feature is not allowed |
| AT+CPHS=0,7 Note :Deactivation of CPHS Info. | OK Note :No effect. |

15.35.3 Defined values

<service> value indicating the field of CSP field to display (see appendix 19.15, column External Value)

<status>

0 : service is not customer-accessible

1 : service is customer-accessible

Note : The field Alternate Line Service (CPHS Teleservices Group) is used to set or not the ALS feature at the initialisation.

15.36 CENTEL Battery Charge Management +WBCM

15.36.1 Description

This specific command allows the management of the battery charging operations (start and stop the charge, enable or disable unsolicited +WBCI Battery Charge Indications). It also sets the battery charge parameters.

15.36.2 Syntax

Command syntax : AT+WBCM=<Mode>[[<ChargeInd>][,<BattLevelMax>],
[<BattLevelMin>],[<TPulseInCharge>],
[<TPulseOutCharge>],[<BattIntRes>]]

| Command | Possible responses |
|---|--|
| AT+WBCM=0 Note :Stop the battery charging. | OK |
| AT+WBCM=1,1 Start the battery charging withcharge indications. | OK |
| | +WBCI: 2,4060 Note : Unsolicited charge indication: the current battery voltage is 4.06 V. (See +WBCIdescription) |
| AT+WBCM=1,0 Note :Start the battery charging without charge indications. | OK |
| AT+WBCM=2 Note :Get the battery voltage during the charging. | +WBCI: 2,4110 OK Note : See the description of+WBCI unsolicited response. The current battery voltage is 4.11 V. |

| Command | Possible responses |
|---|---|
| | +WBCI: 1 Note :The battery voltage has reached the max level. The battery is considered as charged and the charging is stopped. |
| AT+WBCM? | +WBCM: 0,0,4200,3300,100,5000,0 OK Note :Current values. |
| AT+WBCM=0,1 Note :Enable the battery charge unsolicited indications out of charge. | OK |
| | +WBCI: 3,4195 Note :The current battery voltage is 4.195 V. |
| AT+WBCM=3,0,3800,3000,500,3000,0 Note :Configure the battery charging parameters. | OK |
| AT+WBCM=? Note :Get the parameters range. | +WBCM: (0-3),(0-1),(4000-5000),(2800-3800), (100-10000),(100-10000),(0-255) OK |
| | +WBCI: 0 Note : The battery voltage has reached the min level. The battery is considered as discharged, and the product is turned off, with the +CPOFcommand behavior. |

15.36.3 Defined values

<Mode>

- 0 : Stop the battery charging (default).
- 1 : Start the battery charging.
- 2 : Get the current battery voltage.
- 3 : Set the battery charge parameters.

Note :

- When <Mode> = 0 or 1, only the <ChargeInd> parameter can be set.
- When <Mode> = 2, no additional parameter can be set.
- When <Mode> = 3, all others parameters can be set.

<ChargeInd>

- 0 : Disable the battery charge unsolicited indications (default value).
- 1 : Enable the battery charge unsolicited indications (see +WBCI description).

<BattLevelMax> : Maximum level for the battery voltage. When reached, the battery is considered as charged. The allowed range is [4000 ; 5000] (in mV, default value is 4200)

<BattLevelMin> : Minimum level for the battery voltage. When reached, the battery is considered as discharged, and the product is turned off (with the +CPOF command behavior). The allowed range is [2800 ; 3800] (in mV, default value is 3100)

Note :

The <BattLevelMax> and <BattLevelMin> parameters cannot be changed during the battery charging (when <Mode> = 1).

<TPulseInCharge> Time between pulses for the pulsed charge.

The pulse duration lasts one second. When the battery charging is started with unsolicited charging indications (<ChargeInd>= 1), +WBCI responses are returned by the ME with a period equals to (<Pulse Time> (= 1s.) +<TPulseInCharge>).

The allowed range is [100 ; 10000]. (unit is ms, default value is 100).

<TPulseOutCharge> Time between +WBCI unsolicited responses, when the battery charge is stopped with charging indications requested (<ChargeInd> = 1).

The allowed range is [100 ; 10000] (in ms, default value is 5000).

<BattIntRes> : Battery Internal Resistor.

This parameter must be set to have correct values with +WBCI unsolicited results.

The allowed range is [0 ; 255] (in m Ω , default value is 0)

Note :

When the <BattIntRes> parameter is changed, the product must be reset to take the modification into account.

15.37 Unsolicited result : CENTEL Battery Charge Indication +WBCI

15.37.1 Description

This unsolicited indication returns information about the battery charge (maximum level reached, current battery voltage).

15.37.2 Syntax

Unsolicited response syntax : +WBCI: <Status>[,<BattLevel>]

15.37.3 Defined values

<Status>

- 0 : Minimum battery level reached. The battery is considered as discharged.
The product is turned off (as with the +CPOF command).
- 1 : Maximum battery level reached. The battery is considered as charged.
The battery charging is stopped.
- 2 : Battery currently in charge.
- 3 : Battery currently out of charge.

<BattLevel> : Current battery voltage during or out of the charging.
The possible range is [2800 ; 5000]. (in mV)

Note :

<Status> = 2 and 3 are solicited, by the AT+WBCM=2 command, or unsolicited when the <ChargeInd> parameter of the +WBCM command is set to 1. With these <Status> values, the <BattLevel> parameter is also present.

15.38 Features Management +WFM

15.38.1 Description

This specific command allows some features to be enabled or disabled.

Note :

After a modification, the changes will be taken into account only after a **reset of the product**.

15.38.2 Syntax

Command syntax AT+WFM=<mode>[,<FtrID>]

Response syntax +WFM: <FtrID>,<status>,<resetFlag>

| Command | Possible responses |
|---|---|
| AT+WFM=2,"BI9001800" | +WFM: "BI9001800",1,0 OK Note : Dual-band mode 900/1800 is enabled |
| AT+WFM=1,11 Note : Enable the Mono-band 900 mode | +CME ERROR: 3 Note : Band selection are not allowed with AT+WFM command |
| AT+WFM=0,61 | +CME ERROR: 3 Note : <mode>=0 is not allowed on <FtrID> values with 2 digits |
| AT+WFM=0,"EFR" Note : Disable the Enhanced Full Rate feature | OK |

15.38.3 Defined values

<mode>

0 : disable feature <FtrID>

1 : enable feature <FtrID>

2 : interrogate the status of the <FtrID> feature.

If the <FtrID> parameter is not used, the status of all the features are listed (with several +WFM responses).

<FtrID>

| Numeric value | String value | Meaning |
|---------------|-----------------|---|
| 11 | "MONO900" | Mono-band mode 900 MHz (def. 0) |
| 12 | "MONO1800" | Mono-band mode 1800 MHz (def. 0) |
| 13 | "MONO1900" | Mono-band mode 1900 MHz (def. 0) |
| 14 | "BI9001800" | Dual-band mode 900/1800 MHz (def. 1) |
| 15 | "BI9001900" | Dual-band mode 900/1900 MHz (def. 0) |
| 16 | "MONO850" | Mono-band mode 850 MHz (def. 0) |
| 17 | "BI8501900" | Dual-band mode 850/1900 MHz (def. 0) |
| 18 | "QUADBAND" | Quad-band mode 850/900/1800/1900 MHz |
| 2 | "EFR": | Enhanced Full Rate feature (def. 1) |
| 31 | "NOHR_NOECHO" | HR and ECHO features are disabled |
| 32 | "HR" | Half Rate feature (def. 1) |
| 33 | "ECHO" | Echo Cancel (def. 0) |
| 4 | "DTXDATA" | Data with DTX feature (def. 1) |
| 5 | "DATA144" | Data 14.4 kbit/s feature (def. 1) |
| 61 | "SIM3VONLY" | 3V SIM voltage mode (def. 0) |
| 62 | "SIM5VONLY" | 5V SIM voltage mode |
| 63 | "SIM3AND5V" | Both 3 and 5V SIM voltage mode (def. 1) |
| 7 | "SIMREMOVE" | SIM removal feature (def. 1) |
| 81 | "NOINTERRUPT" | No management of interruption (def. 0) |
| 82 | "QUICKOFF" | Quick Off mode (def. 0) |
| 83 | "OFFWHENUNPLUG" | Off when unplug mode (def. 0) |
| 84 | "INTERRUPT" | interruption for customer (def. 1) |
| 9 | "SWITCHATT" | Switch Attenuation feature (def. 1) |
| A | "CPHS" | CPHS feature (def. 1) |
| B | "SIMSPEEDENH" | SIM speed enhancement feature (def.0) |
| C | "LOCA" | Location feature (def. 0) |

Notes :

- The +WFM response only use alphabetical values for the <FtrID> parameter.
- For<FtrID>values with two digits (like 1x, 6x or 8x), the<mode>0 value is not allowed. When a « xa » feature is enabled, enabling an other « xb » feature will automatically disable the « xa » feature. For example, if the "MONO900" feature is enabled, if the "BI9001800" feature is activated, the "MONO900"feature gets automatically disabled. Likewise, the "HR" feature and the "ECHO" feature are exclusive. If "NOHR_NOECHO" is activated, both features "HR" and "ECHO" are disabled.
- "MONO900", "MONO850", "MONO1800", "MONO1900", "BI9001900", "BI9001800", "BI8501900" and "QUADBAND" features are read-only. In order to change the Band selection use AT+WMBS command, see § 15.54.

<status>

0 : the <FtrID> feature is disabled
 1 : the <FtrID> feature is enabled

<resetFlag>

0 : the feature has not been modified since the last boot of the product.
 1 : the feature has been modified since the last boot of the product; a reset must be performed to

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take the modifications into account.

Note: If a feature is reset to its initial value after a modification, the <resetFlag> parameter will be reset to 0.

15.39 Commercial Features Management +WCFM

15.39.1 Description

This command enables ou disables CENTEL specific features. Disabling a feature can be done with no restriction, but a password is required to enable features.

Note : Once a feature successfully enabled or disabled, the product needs to be reset to take the modification into account.

15.39.2 Syntax

Command syntax AT+WCFM=<mode>,[<FtrMask>[,<Password>]]

| Command | Possible responses |
|---|---|
| AT+WCFM=0,"0A00" Note : Disable some features | OK |
| AT+WCFM=2 Note : Display of the feature status | 0000 OK |
| AT+WCFM=1,"0003","1234567890A BCDEF1234567890ABCDEF12345678 90ABCDEF1234567890ABCDEF" Note : Enable features | OK Note : The features are enabled (the password is correct) |
| AT+WCFM=1,"0050","1234567890A BCDEF1234567890ABCDEF12345678 90ABCDEF1234567890FFFFFF" Note : Enable features | +CME ERROR: 3 Note : Incorrect password |

15.39.3 Defined values

<mode>

0 : disable some features of <FtrMask>
1 : enable some features of <FtrMask>
2 : display the features state

<FtrMask> : features mask

16 bits hexadecimal string (4 characters from 0 (zero) to 'F')

<PassWord> : Password

256 bits hexadecimal string (64 characters from 0 (zero) to 'F')

15.40 CENTEL Customer storage mirror +WMIR

15.40.1 Description

This specific command allows to make a mirror copy of the current configuration parameters in the EEPROM. In case of memory problem for the storage, if a customer mirror already exists, this one will be restored. Otherwise, the CENTEL default mirrored parameters are restored.

15.40.2 Syntax

Command syntax AT+WMIR

| Command | Possible responses |
|---|--------------------|
| AT+WMIR=? | OK |
| AT+WMIR Note : Build the Customer Mirror | OK |

15.40.3 Defined values :

No parameter

15.41 CENTEL Change Default Player +WCDP

15.41.1 Description

This specific command allows the default melody player to be selected.

15.41.2 Syntax

Command syntax AT+WCDP = <player>

| Command | Possible responses |
|---|---------------------|
| AT+WCDP=? | +WCDP : (0-1) OK |
| AT+WCDP=0 Note : Select the speaker. | OK |
| AT+WCDP? | +WCDP: 0 OK |

15.41.3 Defined values :

<player>

0 : Buzzer
1 : Speaker

15.42 CENTEL CPHS Mail Box Number: +WMBN

15.42.1 Description

This specific command sets the different mailbox numbers in SIM. The +CPHS command can be used to know which mailbox numbers can be updated.

15.42.2 Syntax

Command syntax AT+WMBN = <Lineld>,<number>,<type>,<name>

Response syntax (to AT+CPHS=2,2)

+WMBN = <Lineld>,<number>,<type>,<name>,<status>

| Command | Possible responses |
|--|---|
| AT+WMBN=? | OK |
| AT+WMBN? | OK |
| AT+CPHS=2,2 Note : Get the current Mail Box Numbers in SIM | +WMBN: 1,"0123456789",129,"Maison",1 +WMBN: 2,"9876543210",129,"Travail",1 +WMBN: 3,,,,1 +WMBN: 4,,,,1 OK |
| AT+WMBN=1,"+33122334455",145 Note : Set mailbox number for line1. | OK Note : Mailbox number for Line1 is set. |
| AT+WMBN=2 Note : Erase mailbox number & name for line2 | OK |
| AT+CPHS=2,2 Note : Get the current Mail Box Numbers again | +WMBN: 1,"+33122334455",145,,1 +WMBN: 2,,,,1 +WMBN: 3,,,,1 +WMBN: 4,,,,1 OK |

15.42.3 Defined values

<LineId>

1 : Line 1
2 : Line 2
3 : Data
4 : Fax

<number> : Phone number in ASCII format.

<type> : TON/NPI
(Type of address byte in integer format).

<name> : name of mailbox.

Notes :

- For the<name> parameter all strings starting with "80", "81" or "82" are considered in UCS2 format. See the APPENDIX E: Coding of Alpha fields in the SIM for UCS2. If a wrong UCS2 format is entered, the string is considered as an ASCII string.
- The AT command +WPCS affect the format of the Mailbox <name> entry.

<status>

When checked with "AT+CPHS=2,2", it indicates if the number can be updated or not:

0 : Update is not possible
1 : Update is possible

15.43 CENTEL Alternate Line Service: +WALS

15.43.1 Description

This specific command allows to set and to get the active line. The +CPHS command can be used to know which line is activated.

15.43.2 Syntax

Command syntax AT+WALS = <CmdType>[,<LineId>]

Response syntax (to AT+CPHS=2,3)

+WALS = <LineId>

| Command | Possible responses |
|---|---|
| AT+WALS? | +WALS: 1 OK Note : Display the current active line |
| AT+WALS=? | +WALS: (0-1),(1-2) OK |
| AT+WALS = 0,1 Note : Activate Line 1 | +WALS: 1 OK |
| AT+WALS = 0,2 Note : Activate Line 2 | +CME ERROR: 3 Note : When the ALS feature is not allowed |
| AT+WALS = 1 Note : Get the current activate Line | +WALS: 1 Note : Display the current active line |
| AT+WALS = 1,2 | +CME ERROR: 3 Note : Syntax error |
| AT+CPHS=0,3 Note : Deactivation of ALS feature. | OK Note : No effect. |
| AT+CPHS=2,3 Note : Interrogate of ALS Feature | +WALS: 1 Note : Display the current active line +CME ERROR: 3 Note : in the case where the ALS feature is not allowed |

15.43.3 Defined values

<CmdType>

0 : Set active line
1 : Get active line

<LineId>:

Only used for <CmdType>= 0

1 : Line 1
2 : Line 2

15.44 CENTEL Open AT control command +WOPEN

15.44.1 Description

This specific command allows to start, stop, delete and get information about the current Open AT embedded application.

Note : This command is only available if the Open AT feature is enabled (cf +WCFM command).

15.44.2 Syntax

Command syntax AT+WOPEN=<Mode>

Response syntax +WOPEN: <Mode>[,<IntVersion>[<ExtVersion>]]

| Command | Possible responses |
|--|---|
| AT+WOPEN=? | +WOPEN: (0-4) OK |
| AT+WOPEN? | +WOPEN: 0 OK |
| AT+WOPEN=2 Note : Get the Open-AT library versions. | +WOPEN: 2, "AT v2.00", "AT v2.00" OK Note : Open-AT v2.00 library version. An embedded application has been downloaded on this product. |
| AT+WOPEN=3 | OK Note : The objects flash are erased |
| AT+WOPEN=1 Note : Start the embedded application. | OK +WIND: 3 Note : Product reset in order to start the embedded application. |
| AT+WOPEN = 3 | +CME ERROR: 532 Note : the embedded application is activated so the objects flash are not erased. |
| AT+WOPEN = 4 | +CME ERROR: 532 Note : the embedded application is activated so it cannot be erased |

| Command | Possible responses |
|---|---|
| AT+WOPEN=0 Note : Stop the embedded application. | OK +WIND: 3 Note : Product reset in order to stop the embedded application. |
| AT+WOPEN=3 | OK Note : The objects flash are erased |
| AT+WOPEN=4 | OK Note : the embedded application is erased |
| AT+WOPEN? | +CME ERROR: 3 Note : The Open AT feature is disabled. |

15.44.3 Defined values :

<Mode>

- 0 : Stop the Open-AT embedded application.
If the product was running, it resets.
- 1 : Start the Open-AT embedded application.
If the product was stopped, it resets.
- 2 : Get the Open AT library versions.
- 3 : Erase the objects flash of the Open-AT embedded application.
- 4 : Erase the Open-AT embedded application.

Note : Mode = 3 and 4 are only available if Open-AT embedded application is stopped (AT+WOPEN=0).

<IntVersion>

Ascii string giving the internal Open AT library version.

<ExtVersion>

Ascii string giving the external Open AT library version.

Note :

If no embedded application is loaded, the<ExtVersion>parameter does not appear.

15.45 CENTEL Reset +WRST

15.45.1 Description

This specific command resets the module after the time specified by the <delay> parameter.

15.45.2 Syntax

Command syntax : AT+WRST =<Mode>,<Delay>

Response syntax : +WRST: <Mode>,<Delay>,<RemainTime>

| Command | Possible responses |
|---|--|
| AT+WRST=? | OK |
| AT+WRST=0 Note : Disable timer | OK |
| AT+WRST=1,"001:03" Note : Enable timer and set delay at 1 hour 3 minutes | OK |
| AT+WRST? | +WRST: 1,"001:03","001:01" OK Note: Timer activated to reset after 1 hour and 3 minutes. At this point, 1 hour and 1 minute remain before next reset. |

15.45.3 Defined values :

<val1> :

0 : timer reset is disabled

1 : timer reset is enabled

<Delay>: sets the time before reset

Range "000:01"- "168:59" (format hhh:mm)

<RemainTime> : time before next reset

Range "000:01"- "168:59" (format hhh:mm)

15.46 Set Standard Tone +WSST

15.46.1 Description :

This specific command allows to set/get the sound level of the Standard Tones.

15.46.2 Syntax :

Command syntax : AT+WSST=[<sound level>],[<ring tone level>]

| Command | Possible responses |
|--|---|
| AT+WSST=0 Note : Set volume to Max. | OK |
| AT+WSST=15 Note : Set volume to Min. | OK |
| AT+WSST=,5 Note : Set ring tone level to 5 | OK |
| AT+WSST? Note : getcurrent standard tones sound level | +WSST: 15,5 OK Note : current standard tones level is 15 (mini.), and ring tone level is 5. |
| AT+WSST=? Note : supported parameters | +WSST: (0-15),(0-15) OK |

15.46.3 Defined values :

<sound level>

Range [0 ; 15]

0 : Maximum volume (default)

15 : Minimum volume

<ring tone level>

Range [0 ; 15]

0 : Maximum volume (default)

15 : Minimum volume

15.47 CENTEL Location +WLOC

15.47.1 Description :

This specific command can be used by the application to retrieve the following local informations : MCC-MNC, LAC, CI, Network measurement, BCCH channel list, Timing Advance, Date and Time.

Two ways exist for the external application to get these information : on request of the application, or automatically by the module every x seconds (x has to be a multiple of 5 different from 0).

The location feature has to be activated to get information.
if the feature is not activated,"ERROR" is sent.
If the data are not valid at the requested time, the network measurement, BCCH list and Timing Advance cannot be displayed ("," is displayed instead).

15.47.2 Syntax :

Command syntax : AT+WLOC =< mode > [,< time period/dump >]

| Command | Possible responses |
|--|--------------------|
| AT+WLOC=0 Note : stops the display of local information | OK |
| AT+WLOC=3,255 Note : set the wished information to display (255 -> complete information) | OK |

| Command | Possible responses |
|---|---|
| AT+WLOC=1 Note : displays once the local information | +WLOC: 02f802,0006,7772,f13101b04cf5127 8 91138e95a846d160,8b49d08d0797c 419e272e10889a0000093021703990 20403c1020a03c5020a03,00,010121 111349ff OK |
| AT+WLOC=2,6 Note : 6 is not a multiple of 5 | +CME ERROR:3 |
| AT+WLOC=2,10 Note : displays OK then the current local information immediately for the first time and then every 10 seconds. | OK +WLOC: 02f802,0006,7772,ed3001af4cf492780 b040889c74acc23,8b49d08d0797c419e2 72e1 0889a000009302160399020503c1020a0 3c5020 a03,00,010121111354ff +WLOC: 02f802,0006,7772,f02d01ae4cf41278 4b03c889c846dba5,8b49d08d0797c 419e272e10889a0000093021703990 20403c1020a03c5020903,00,010121 111404ff ... |
| AT+WLOC=? Note : The feature "loca" is not activated | +CME ERROR:3 |
| AT+WLOC? Note : The feature "loca" is not activated | +CME ERROR:3 |
| AT+WLOC=? Note : The feature "loca" is activated | OK |
| AT+WLOC? Note : The location is not in mode automatic, the period value is set to 5 seconds, the configuration value is set to 255 | +WLOC: 0,5,255 OK |
| AT+WLOC? Note : The location is in mode automatic, the period value is set to 10 seconds, the configuration value is set to 20 | +WLOC: 1,10,20 OK |

15.47.3 Defined values :**<mode>**

- 0 : Stop automatic shots
- 1 : One shot requested
- 2 : Automatic shots requested (every x seconds)
- 3 : Configuration of the wished information

for <mode> = 2 :

<time period> optional parameter –

Range : [5 - 255] – in seconds

it has to be a multiple of 5.

default value of time period : 5 seconds

The automatic mode for location is saved in EEPROM, so will be taken into account after an Init (+WLOC:··· will be displayed).

Fields of the response to AT+WLOC=1 or AT+WLOC=2 :

The format of these fields are as specified in 04.08 :

| Parameter | Type |
|---------------------|--|
| MCC-MNC | 3 bytes |
| LAC | 2 bytes |
| CI | 2 bytes |
| Network measurement | 16 bytes |
| BCCH channel list | Maximum 48 bytes (version V0) Or 129 bytes (version V1) |
| Timing Advance | 1 byte |
| Date and Time | 7 bytes : Date, time and timezone at STLK Format |

for mode = 3 :

<dump> optional parameter

Range : [1-255] (at least 1 bit set to 1).

- if bit 0 set to 1 (value 1) : DaT will be returned in the response
- if bit 1 set to 1 (value 2) : TA will be returned in the response
- if bit 2 set to 1 (value 4) : BCCH will be returned in the response
- if bit 3 set to 1 (value 8) : NetMeas will be returned in the response
- if bit 4 set to 1 (value 16) : CI will be returned in the response
- if bit 5 set to 1 (value 32) : LAC will be returned in the response
- if bit 6 set to 1 (value 64) : MNC-MCC will be returned in the response

Notes :

- After having downloaded the EEPROM configuration: default value of <dump> is 0xFF (all information returned).
- The <dump> value set with the command "at+wloc=3,xx" is saved in EEPROM, so it will be taken into account after an Init.

Fields of the response to AT+WLOC? :

The response is built as follows

+WLOC: <mode>,<timeperiod>,<dump>

<mode> :

0 : no automatic mode

1 : automatic mode

<timeperiod>, <dump> :see above.

15.48 CENTEL Bus Read +WBR

15.48.1 Description

This specific command allows to read a buffer from a specific bus (SPI, I2C Soft or Parallel).

Note : Bus configuration is set by the +WBM command.

15.48.2 Syntax

Command syntax : AT+WBR=<BusId>,<Size>[,<Address>[,<Opcode>]]

Response syntax : +WBR: <Data><CR><LF>

OK

| Command | Possible responses |
|---|-----------------------------|
| AT+WBR=0,9,"ABFF","C9" Note : Read 9 bytes from the SPI bus, after having sent the 0xC9 Opcode byte and ABFF Address. | +WBR: 0A5F98231012345678 OK |
| AT+WBR=1,5,"2A" Note : Read 5 bytes from the I2C Soft bus, at the 0x2A slave address. | +WBR: 0102030405 OK |
| AT+WBR=2,2,0 Read 2 bytes from the Parallel bus with the A2 pin set to 0. | +WBR: A000 OK |

15.48.3 Defined values

< BusId >

0 : SPI bus.
1 : I2C Soft bus.
2 : Parallel bus.

<Size>

Size of data to read, in bytes (**max 256 bytes**).

<Address>

- For SPI bus :
OnQ24X3 and P32X3 products :
Up to 2 address bytes as an ASCII hexadecimal string, usable only if the <opcode> byte is set. If the address field is not used, the parameter must not be set (default).
OnQ24X6 and P32X6 products :
Up to 4 address bytes as an ASCII hexadecimal string.
If the <address> field is not used, the parameter must not be set (default).
- For Parallel bus :
0 : set the A2 pin to 0 (default)
1 : set the A2 pin to 1
- For I2C Soft bus :
Slave address byte, in hexadecimal format (default is 0x00).
This is a 7-bits address, shifted to left from 1 bit, padded with the LSB set to 1 (to read), and sent first on the I2C bus before performing the read operation.

<Opcode> (for SPI bus only)

OnQ24X3 and P32X3 products :

Up to 1 opcode byte as an ASCII hexadecimal string. If the <opcode> field is not used, the parameter must not be set (default).

OnQ24X6 and P32X6 products :

Up to 4 opcode bytes as an ASCII hexadecimal string. If the <opcode> field is not used, the parameter must not be set (default).

15.49 CENTEL Bus Write +WBW

15.49.1 Description

This specific command allows to write a buffer on a specific bus (SPI, I2C soft or parallel).

Note : Bus configuration is set by the +WBM command.

15.49.2 Syntax

Command syntax: AT+WBW=<BusId>,<Size>[,<Address>]<CR>
<Data Buffer> <ctrl-Z >

| Command | Possible responses |
|--|--|
| AT+WBW=0,10<CR> 0123456789ABCDEF0123<ctrl-Z> Note : Write 10 bytes on the SPI bus. | OK Note : Data buffer is written on SPI bus. |
| AT+WBW=1,5<CR> 0246801234<ctrl-Z> Note : Write 5 bytes on the I2C Soft bus. | OK Note : Data buffer is written on I2C Soft bus. |
| AT+WBW=2,2,0<CR> 434F<ctrl-Z> Note : Write 2 bytes on the Parallel bus with the A2 pin set to 0. | OK Note : Data buffer is written on PARALLEL bus. |

15.49.3 Defined values

<BusId>

0 : SPI bus.
1 : I2C Soft bus.
2 : Parallel bus.

<Size>

Size of data buffer, in bytes. (max. 256 bytes)

<Address>

- For SPI bus :
Not Used
- For Parallel bus :
0 : set the A2 pin to 0 (default)
1 : set the A2 pin to 1
- For I2C Soft bus :
Slave address byte, in hexadecimal format (default "00").
This is a 7-bits address, shifted to left from 1 bit, padded with the LSB set to 0 (to write),
and sent first on the I2C bus before performing the writing operation.

<Data Buffer> : Data buffer to write on the specific bus.

This parameter must only contain hexadecimal characters (0-9, A-F) **Its length must be twice the <Size> parameter.**

15.50 CENTEL Bus Management +WBM

15.50.1 Description

This specific command allows to manage specific buses (SPI, I2C Soft, Parallel) with a given configuration.

15.50.2 Syntax

- Command Syntax for SPI bus

```
AT+WBM=<BusId>,<Mode>,[<Clock_Speed>],[<Clock_Mode>],
    [<ChipSelect>],[<ChipSelectPolarity>],[<LsbFirst>],
    [<Gpio ChipSelect>],[<Gpio Handling>]
```

- Command Syntax for I2C bus

```
AT+WBM=<BusId>,<Mode>,[<Scl_Gpio>],[<Sda_Gpio>]
```

- Command Syntax for parallel

The parameters depend on ChipSelect configuration :

if CS is Gpio 5 :

```
AT+WBM=<BusId>,<Mode>,[<Chip_Select>],[<Order>],[<Gpio_NbWaitS tate>]
```

if CS is LCD_EN

```
AT+WBM=<BusId>,<Mode>,[<Chip_Select>],[<Order>],
    [<LCDEN_AddressSetupTime>],
    [<LCDEN_SignalPulseDuration>],
    [<LCDEN_PolarityControl>]
```

| Command | Possible responses |
|---|-------------------------------|
| AT+WBM=0,1,1,3,1,0,1 Open SPI bus with configuration : (on Q24X3 product) Clock Speed : 812 kHz Clock Mode : 3 ChipSelect : LCDEN ChipSelectPolarity : LOW LsbFirst : MSB | OK |
| AT+WBM=1,1,0,4 Open I2C Soft bus with configuration : Scl Gpio : 0 Sda Gpio : 4 | OK |
| AT+WBM=2,1,0,1,10, 31,0 Open PARALLEL bus with configuration : (on P32X3 product) ChipSelect : LCDEN Order: Direct LcdenAddressSetUpTime: 10 LcdenSignalPulseDuration : 31 PolarityControl : low | OK |
| AT+WBM=0,2 | +WBM: 0,1,1,3,1,0,1,0,0 OK |
| AT+WBM=1,0 Close I2C bus. | OK |
| AT+WBM=1,2 | +WBM: 0,0,0,4 OK |
| AT+WBM=1,1 Open I2C Soft bus with the last configuration : Scl Gpio : 0 Sda Gpio : 4 | OK |
| AT+WBM = 1,2 | +WBM: 1,1,0,4 OK |

15.50.3 Defined values

<BusId>

- 0 : SPI bus.
- 1 : I2C bus.
- 2 : Parallel bus. (Only on Wismo Pac products)

<Mode>

- 0 : close bus.
- 1 : open bus.
- 2 : get bus status.

15.50.3.1 for SPI bus :**<Clock Speed>**

| Q24X3 and P32X3 products | | Q24X6 and P32X6 products | |
|--------------------------|-----------|--------------------------|-----------|
| Value | Frequency | Value | Frequency |
| 0 (default) | 101 kHz | 0 (default) | 13 MHz |
| 1 | 812 kHz | 1 | 6,5 MHz |
| 2 | 1,625 MHz | 2 | 4,33 MHz |
| 3 | 3,25 MHz | 3 | 3,25 MHz |
| | | 4 | 2,6 MHz |
| | | 5 | 2,167 MHz |
| | | 6 | 1,857 MHz |
| | | 7 | 1,625 MHz |
| | | 8 | 1,44 MHz |
| | | 9 | 1,3 MHz |
| | | 10 | 1,181 MHz |
| | | 11 | 1,083 MHz |
| | | 12 | 1 MHz |
| | | 13 | 926 kHz |
| | | 14 | 867 kHz |
| | | 15 | 812 kHz |

<Clock Mode>

- 0 : rest state is 0, the data is valid on rising edge (default value).
- 1 : rest state is 0, the data is valid on falling edge.
- 2 : rest state is 1, the data is valid on rising edge.
- 3 : rest state is 1, the data is valid on falling edge.

<ChipSelect> (default 0)

0 : GPIO (default value)

Note : See <GpioChipSelect> and <GpioHandling> parameters.

1 : SPI_EN on Q24X3 and P32X3 products

Note :

on Q24X6 product, the SPI_EN pin is replaced by the GPO 3 output (Gpio ChipSelect = 7, refer to +WIOM command)

on P32X6 product, the SPI_EN pin is replaced by the GPIO 8 output (Gpio ChipSelect = 7, refer to +WIOM command)

2 : SPI_AUX on Q24X3 and P32X3 products

Note :

on Q24X6 and P32X6 products, the SPI_AUX pin is replaced by the GPO 0 output (Gpio ChipSelect = 6, please refer to the +WIOM command)

<ChipSelectPolarity>

- 0 : LOW (Chip select signal is valid on low state). (Default value).
- 1 : HIGH (Chip select signal is valid on high state)

<LsbFirst>

- 0 : LSB (Data are sent with LSB first)
- 1 : MSB (Data are sent with MSB first) (default value)

<Gpio ChipSelect > if ChipSelect = GPIO (default GPIO 0, see § 15.12.3)

The GPIO value is between 0 and 7.
It must be a GPIO or a GPO (not a GPI), and not allocated by any Open-AT embedded application.
Please refer to +WIOM command

<Gpio Handling > if ChipSelect = GPIO

- 0 : SPI BYTE (GPIO signal pulse on each written or read byte)
- 1 : SPI FRAME (GPIO signal works as a standard Chip Select signal) (default value)

15.50.3.2 for I2C bus :**<Scl Gpio> (default value is 0)**

The Scl GPIO value is between 0 and 7.
It must be a GPIO (not a GPI or GPO) and not allocated by an Open-AT embedded application.

<Sda Gpio> (default value is 4)

The Sda GPIO value is between 0 and 7.
It must be a GPIO (not a GPI or GPO) and not allocated by an Open-AT embedded application.

15.50.3.3 for Parallel bus (only on Pac products) :**<ChipSelect> (default value is 1)**

- 0 : GPIO 5 (it must not be allocated by any Open-AT application)
- 1 : LCDEN (same pin as SPI_EN, and Gpio 8 on P32X6 products (it must not be allocated by any Open-AT application))

<Order> (default value is 0)

- 0 : DIRECT
- 1 : REVERSE

<LCDEN AddressSetupTime> if ChipSelect = LCDEN (default value is 0)

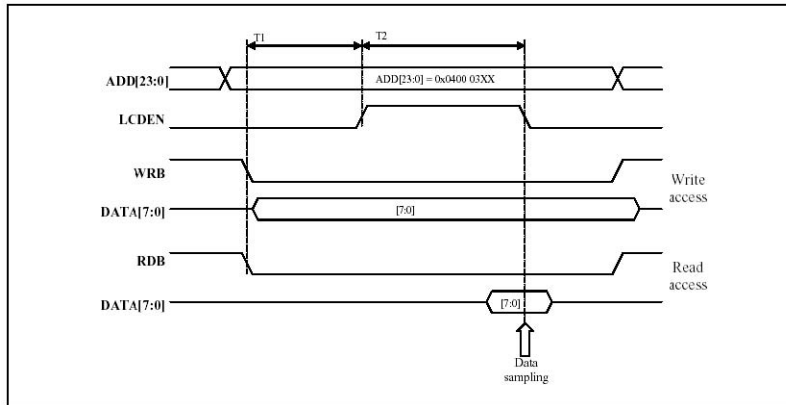
The **<Lcd AddressSetupTime>** value is between 0 and 31.

The resulting time is :

For P32X3 product: $(X * 38.5)$ ns ;

For P32X6 product : $(1 + 2 X) * 19$ ns.

This is the time between the setting of an address on the bus, and the activation of the LCD_EN pin (T1 on the figure bellow).



<LCDEN SignalPulseDuration> if ChipSelect = LCDEN (default value is 0)

The <Lcd LcdenSignalPulseDuration> value is between 0 and 31.

The resulting time is :

For P32X3 product: $(X + 1.5) * 38.5 \text{ ns}$;

For P32X6 product: $(1 + 2 * (X + 1)) * 19 \text{ ns}$

(Warning, for this product, the 0 value is considered as 32).

This is the time during which the LCD_EN signal is valid (T2 on the figure above).

<LCDEN PolarityControl> if ChipSelect = LCDEN (default value is 0)

0 : LOW (LCD_EN signal is valid on low state)

1 : HIGH (LCD_EN signal is valid on high state)

<GPIO NbWaitState> if ChipSelect = GPIO (default value is 0)

This is the time during which the data is valid on the bus.

0 : 62 ns

1 : 100 ns

2 : 138 ns

3 : 176 ns

Notes :

- If one or two IOs are needed by a bus, they are not available any more for the +WIOR , +WIOW, +WIOM commands. When the corresponding bus is closed, these commands resume the control of the IOs.
- A bus may not be available for an open operation if an Open-AT embedded application has opened it before with the same parameters. In this case, the +WBM command will return +CME ERROR: 3.

15.51 CENTEL Hang-up +WATH

15.51.1 Description

This specific command is used by the application to disconnect the remote user, specifying a release cause and the location. In the case of multiple calls, all calls are released (active, on-hold and waiting calls).

15.51.2 Syntax

Command Syntax AT+WATH=<RelCause>,<location>

| | |
|--|---|
| AT+WATH=31 Note : Ask for disconnection with release cause=normal and location=USER | OK Note : Every call, if any, are released |
| AT+WATH=? | +WATH: (1-127),(0-5,7,10) |
| AT+WATH=17,2 Note : Ask for disconnection with release cause=user busy and location=public network serving the local user | OK Note : Every call, if any, are released |

15.51.3 Defined values

<RelCause> :

decimal value from 1 to 127 (see the table in appendix 18.4 "Failure Cause from GSM 04.08 recommendation)

<location> :

optional parameter (default value =0)
values as defined in 04.08

- 0 : user
- 1 : private network serving the local user
- 2 : public network serving the local user
- 3 : transit network
- 4 : public network serving the remote user
- 5 : private network serving the remote user
- 7 : international network
- 10 : network beyond interworking point

Notes :

"AT+WATH=0" has the same behaviour as "ATH"

15.52 Write IMEI +WIMEI

15.52.1 Description

The download of the IMEI is available through this specific command. This operation is possible only if the module contains the default IMEI.

The IMEI can only be downloaded once.

No password is needed. If the download is not correct, only CENTEL can reset the IMEI.

15.52.2 Syntax

Command syntax AT+WIMEI=<IMEI>

| Command | Possible responses |
|---|--|
| AT+WIMEI? <i>Request IMEI</i> | +WIMEI: 123456789012345 OK <i>Note: Default IMEI present in EEPROM</i> |
| AT+WIMEI=123456789099995 <i>First Download</i> | OK |
| AT+WIMEI=12345 <i>First Download with wrong length of the string</i> | +CME ERROR: 24 |
| AT+WIMEI=1234567899999996 <i>Try to overwrite an IMEI already downloaded</i> | +CME ERROR: 3 |
| AT+WIMEI? <i>Request IMEI</i> | +WIMEI: 1234567890999995 OK <i>Note: IMEI present in EEPROM</i> |
| AT+WIMEI=? | OK <i>Note: Command valid</i> |

15.52.3 Defined values

<IMEI>

14 or 15 digits as defined by GSM 03.03.

15.53 Write IMEI SVN: +WSVN

15.53.1 Description

The update of the IMEI SVN is available through this **specific** command.

15.53.2 Syntax

Command syntax : AT+WSVN=<IMEISVN>

| Command | Possible responses |
|---|---|
| AT+WSVN? Note: Request IMEI SVN | +WSVN: 10 OK Note: IMEI SVN present in EEPROM |
| AT+WSVN=11 Note: Update the IMEI SVN | OK |
| AT+WSVN=256 | +CME ERROR: 24 Note: wrong length of the string. 1 <= IMEI SVN <= 255 |
| AT+WSVN=? | +WSVN: (1-255) OK Note: Command valid |

15.53.3 Defined values

<IMEI SVN> IMEI SVN value between 1 and 255

15.54 CENTEL multi-band selection command: +WMBS

15.54.1 Description

This command permits to select the GSM bands on which the module have to work. This command is allowed only if the selected bands are supported. The module have to be reset to take this change into account.

15.54.2 Syntax

Command syntax : AT+WMBS=<Band>

| Command | Possible responses |
|----------------|---|
| AT+WMBS=<Band> | OK Note: Band mode selected |
| AT+WMBS=<Band> | +CME ERROR: 3 Note: Band not allowed |
| AT+WMBS? | +WMBS:<Band>,<ResetFlag> OK Note: current selected band mode is returned |
| AT+WMBS=? | +WMBS: (0,3,4) OK Note: Only 850 mono-band or 850-1900 bi-band are available |
| AT+WMBS=? | +WMBS: (0,1,2,3,4,5,6) OK Note: all bands are available |

15.54.3 Defined values

<Band> : frequency band configuration to be supported

- 0 : mono-band mode 850 MHz
- 1 : mono-band mode 900 MHz
- 2 : mono-band mode 1800 MHz
- 3 : mono-band mode 1900 MHz
- 4 : dual-band mode 850/1900 MHz
- 5 : dual-band mode 900/1800 MHz
- 6 : dual-band mode 900/1900 MHz

<ResetFlag>

- 0 : the feature was not modified since the last boot of the product.
- 1 : the feature has been modified since the last boot of the product : it has to be reset in order to take the modification into account.

15.55 Centel Matrix +TMTX

15.55.1 Description:

This command return **GB2312** character matrix in 12*12 mode.

15.55.2 Syntax :

Command syntax : AT+TMTX=<**Mode**>, <**Unicode_data**>

Response syntax : + TMTX: < character matrix in HEX mode>

| Command | Possible responses |
|--|--|
| AT+TMTX=? Note : Ask for the list of possible values | +TMTX: (1),<unicode_data> Note : Mode must be 1 |
| AT+TMTX=1, 4f60597d Note : Get 6123 and 6124 character matrix | +TMTX: 14,00,14,00,27,E0,28,20,69,20,B1,00,25,40, 25,20,25,20,29,20,21,00,23,00 20,00,23,E0,20,20,F8,40,48,80,48,80,4B,E0 ,88,80,50,80,20,80,50,80,89,80 OK |

15.55.3 Defined values:

< Mode >

1 : Get Unicode data matrix

<Unicode_data>

Unicode data which included in **GB2312** CHARSET, the max characters count is 5.

16 SIM TOOLKIT

16.1 Overview of SIM Application ToolKit

16.1.1 Summary

SIM ToolKit, also known as "SIM Application ToolKit" introduces functionalities, which open the way to a broad range of value added services. The principle is to allow service providers to develop new applications (e.g.. for banking, travel, ticket booking, etc.) for subscribers and to download them into the SIM.

This solution allows new services to be accessible to the user by adding new SIM-based applications without modifying the handset.

16.1.2 Functionality

SIM Toolkit refers to the functionalities described in the GSM Technical specification 11.14. It introduces twenty five commands for the SIM. Three classes of increasing ToolKit functionalities have been defined, with class 1 offering a subset of commands and class 3 offering the full range of commands (See table 1 in APPENDIX B).

The SIM Application Toolkit supports:

- profile download,
- proactive SIM,
- data download into SIM.
- menu selection,
- call control by SIM.

16.1.3 Profile download

The Profile Download instruction is sent by the customer application to the SIM as part of the initialization. It is used to indicate which SIM Application Toolkit features is supported by the customer application.

The AT command used for this operation is +STSF (SIM ToolKit Set Facilities).

16.1.4 Proactive SIM

A proactive SIM provides a mechanism whereby the SIM can ask the customer application to perform certain actions.

These actions include:

- display menu,
- display given text,
- get user input,
- send a short message,
- play the requested tone,
- set up a call,
- provide location information.

This mechanism allows SIM applications to generate powerful menu-driven sequences on the customer application and to use services available in the network.

The commands used for this operation are:

- +STIN (SIM Toolkit Indication),
- +STGI (SIM Toolkit Get Information),
- +STGR (SIM Toolkit Give Response).

16.1.5 Data Download to SIM

Data downloading to the SIM (SMS, phonebook ...) allows data or programs (Java applets) received by SMS or by Cell Broadcast to be transferred directly to the SIM Application.

This feature does not need any AT command. It is transparent to the customer application.

16.1.6 Menu Selection

A set of menu items is supplied by the SIM Application Toolkit. The menu selection command can then be used to signal to the SIM Application which menu item is selected.

The commands used for this operation are +STIN, +STGI and +STGR.

16.1.7 Call control by SIM

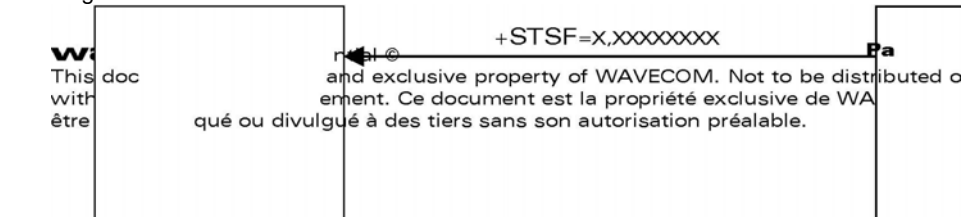
The call control mechanism allows the SIM to check all dialed numbers, supplementary service control strings and USSD strings before connecting to the network. This gives the SIM the ability to allow, bar or modify the string before the operation starts.

The commands used for this operation are :

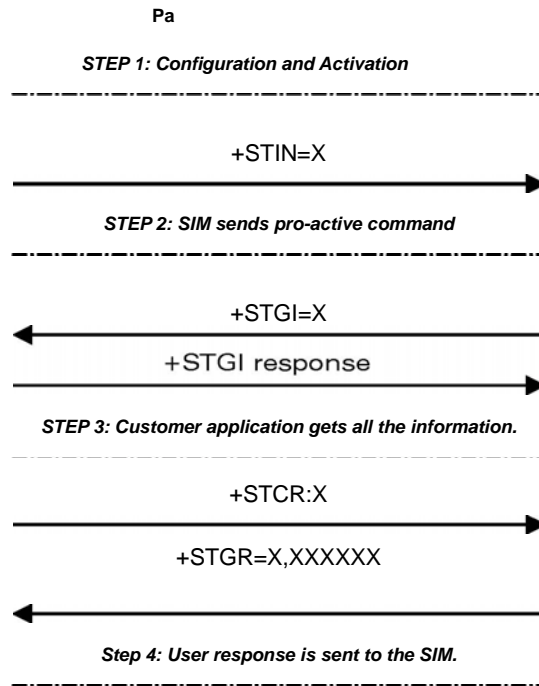
- +STCR (SIM Toolkit Control Response),
- +STGR (SIM Toolkit Give Response).

16.2 Messages exchanged during a SIM ToolKit operation.

The following scheme shows the SIM Toolkit commands and unsolicited results that are exchanged.



+STSF=X,XXXXXXXX



On the first step, the customer application informs the CENTEL product which facilities are supported. This operation is performed with the +STSF (*SIM Toolkit Set Facilities*) command, which also allows to activate or deactivate the SIM Toolkit functionality.

On the second step, an unsolicited result +STIN (*SIM Toolkit indication*) is sent by the product, indicating to the customer application which command type the SIM Application Toolkit is running on the SIM card. The last SIM Toolkit indication can be requested by the +STIN? command.

On the third step, the customer application uses the +STGI (*SIM Toolkit Get Information*) command to get all the information about the SIM Toolkit command, returned by a +STIN message.

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On the fourth step, the customer application uses the +STGR (SIM Toolkit Give Response) to send its response (if any) to the SIM Toolkit Application.

The +STCR (*SIM Toolkit Control response*) indication is an unsolicited result sent by the SIM when Call control functionality is activated and before the customer application has performed any outgoing call, SMS, SS, or USSD.

16.3 SIM TOOLKIT COMMANDS

16.3.1 SIM Toolkit Set Facilities (+STSF)

16.3.1.1 Description

This command allows SIM Toolkit facilities to be activated, deactivated or configured.

16.3.1.2 Syntax

Command syntax :

+STSF=<mode>[,<config>][, <Timeout>][, <AutoResponse>]

| Command | Possible responses |
|--------------|-------------------------|
| +STSF=<Mode> | OK +CME ERROR: <err> |
| +STSF? | +STSF: <Mode> |
| +STSF=? | +STSF: (0-1) OK |

16.3.1.3 Defined values

<mode>

0 : Deactivates the SIM Toolkit functionalities.

1 : Activates the SIM Toolkit functionalities.

16.3.1.4 Error codes

+CME ERROR: 3 Operation not allowed. This error is returned when a wrong parameter is entered.

16.3.2 SIM ToolKit Indication (+STIN)

16.3.2.1 Unsolicited result

In order to allow the customer application to identify the pro-active command sent via SIM ToolKit, a mechanism of unsolicited SIM ToolKit indications (+STIN) is implemented.

Syntax : +STIN: <CmdType>

<CmdType>

- 0 : a 'Setup Menu' pro-active command has been sent from the SIM.
- 1 : a 'Display Text' pro-active command has been sent from the SIM.
- 2 : a 'Get Inkey' pro-active command has been sent from the SIM.
- 3 : a 'Get Input' pro-active command has been sent from the SIM.
- 4 : a 'Setup Call' pro-active command has been sent from the SIM.
- 5 : a 'Play Tone' pro-active command has been sent from the SIM. (*)
- 6 : a 'Sel Item' pro-active command has been sent from the SIM.
- 7 : a 'Refresh' pro-active command has been sent from the SIM. (*)
- 8 : a 'Send SS' pro-active command has been sent from the SIM. (*)
- 9 : a 'Send SMS' pro-active command has been sent from the SIM. (*)
- 10 : a 'Send USSD' pro-active command has been sent from the SIM. (*)
- 11 : a 'SETUP EVENT LIST' pro-active command has been sent from the SIM.
- 98 : timeout when no response from user.
- 99 : a "End Session" has been sent from the SIM.

(*) if the automatic response parameter is activated, this indication is followed by the corresponding +STGI response.

16.3.2.2 Last SIM toolkit indication

The last SIM toolkit indication sent by the SIM can be requested by the AT+STIN? command. This command is only usable between the sending of the STIN indication by the SIM (step 2 : see section 16.2) and the response of the user with the +STGI command (step 3).

Command syntax : +STIN?

| Command | Possible responses |
|--|--|
| +STIN? Note : Ask for the last SIM toolkit indication sent by the SIM | +STIN: 0 OK Note : the last SIM toolkit indication was a Setup Menu |
| +STGI=0 | Note : Display the SIM toolkit application menu |
| +STIN? Note : Ask for the last SIM toolkit indication sent by the SIM | +CME ERROR: 4 Note : operation not supported, the +STGI command has been already used |

16.3.3 SIM ToolKit Get Information (+STGI)

16.3.3.1 Description

This command allows to get the information (text to display, Menu information, priorities...) of a pro-active command sent from the SIM.

The information is returned only after receiving a SIM Toolkit indication (+STIN).

16.3.3.2 Syntax

Command syntax : +STGI=<CmdType>

| Command | Possible responses |
|--------------------------------|-----------------------------------|
| +STGI=<CmdType> See Table 1 | +CME ERROR: <err> +STIN: index |
| +STGI=? | +STGI: (0-11) OK |

Table 1

| Cmd Type | Description | Possible responses |
|----------|--|--|
| 0 | Get information about 'Setup Menu' pro-active command. | +STGI: <Alpha Identifier menu> +STGI: <Id1>,<NbItems>,<Alpha Id1 Label>,<Help Info>[,<NextActionId>]<CR><LF> +STGI: <Id2>,<NbItems>,<Alpha Id2 Label>,<Help Info>[,<NextActionId>]<CR><LF> [...] No action expected from SIM. |
| 1 | Get information about 'Display text' pro-active command. | +STGI: <Prior>,<Text>,<ClearMode> No action expected from SIM. |
| 2 | Get information about 'Get Inkey' pro-active command. | +STGI: <Format>,<HelpInfo>[,<TextInfo>] SIM expects key pressed (+STGR). |
| 3 | Get information about 'Get Input' pro-active command. | +STGI: <Format>,<EchoMode>,<SizeMin>,<SizeMax>,<HelpInfo>[,<TextInfo>] SIM expects key input (+STGR). |
| 4 | Get information about 'Setupt call' pro-active command. | +STGI: <Type>,<CalledNb>,<SubAddress>,<Class> SIM expects user authorization (+STGR). |

| | | |
|---|--|---|
| 5 | Get information about 'Play Tone' pro-active command. | +STGI: <ToneType>[,<TimeUnit>,<TimeInterval>,<TextInfo>] No action. |
|---|--|---|

| Cmd Type | Description | Possible responses |
|----------|--|--|
| 6 | Get information about 'Sel Item' pro-active command. | +STGI: <DefaultItem>, <Alpha Identifier menu><CR><LF> +STGI: <Id1>,<NbItems>,<Alpha Id1 Label>,<Help Info>[,<NextActionId>]<CR><LF> +STGI: <Id2>,<NbItems>,<Alpha Id2 Label>,<Help Info>[,<NextActionId>]<CR><LF> [...] SIM expects an item choice (+STGR). |
| 7 | Get information about 'Refresh' pro-active command. | +STGI: <RefreshType> No action (Refresh done automatically by product). |
| 8 | Get information about 'Send SS' pro-active command. | +STGI:<TextInfo> No action (Send SS done automatically by product). |
| 9 | Get information about 'Send SMS' pro-active command. | +STGI: <TextInfo> No action (Send SMS done automatically by product). |
| 10 | Get information about 'Send USSD' pro-active command. | +STGI: <TextInfo> No action (Send USSD done automatically by product). |
| 11 | Get information about 'SETUP EVENT LIST' proactive command. | +STGI: <Evt> |

16.3.3.3 Defined values

Values when CmdType=0 (Setup menu)

Alpha identifier of the main menu.

<Alpha Identifier menu>

<Idx> (1-255)

Menu item Identifier.

<NbItems> (1-255)

Number of items in the main menu.

<Alpha Idx Label>

Alpha identifier label of items in ASCII format.

<HelpInfo>

- 0: No help information available.
1: Help information available.

<NextActionId>

Contains a pro-active command

identifier.(see the table in APPENDIX D)

Compared to other commands the customer application can always get information about setup menu after having received the +STIN:0 indication.

Values when CmdType=1 (Display text)

<Prior>

- 0: Normal priority of display.
1: High priority of display.

<Text> Text to display in ASCII format.

<ClearMode>

- 0: Clear message after a delay (3 seconds)
1: Wait for user to clear message.

Values when CmdType=2 (Get Inkey)

<Format>

- 0: Digit (0-9, *, #, and +)
1: SMS alphabet default.
2: UCS2

<HelpInfo>

- 0: No help information available.
1: Help information available.

<TextInfo> Text information in ASCII format.

Values when CmdType=3 (Get Input)**<Format>**

| | |
|----|--------------------------|
| 0: | Digit (0-9, *, #, and +) |
| 1: | SMS alphabet default. |
| 2: | UCS2 |
| 3: | Unpacked format. |
| 4: | Packed format. |

<EchoMode>

| | |
|----|-----------|
| 0: | Echo off. |
| 1: | Echo on. |

| | |
|--------------------------------|--------------------------|
| <SizeMin> (1-255) | Minimum length of input. |
| <SizeMax> (1-255) | Maximum length of input. |

<HelpInfo>

| | |
|----|--------------------------------|
| 0: | No help information available. |
| 1: | Help information available. |

<TextInfo> Text information in ASCII format.

Values when CmdType=4 (Setup Call)**<Type>**

| | |
|----|---|
| 0: | Set up call but only if not currently busy on another call. |
| 1: | Set up call, putting all other calls (if any) on hold. |
| 2: | Set up call, disconnecting all other calls (if any). |

<CalledNb> Called party number in ASCII format.

<SubAddress> Called party sub-address in ASCII format.

<Class>

| | |
|----|-------------|
| 0: | Voice call. |
| 1: | Data call. |
| 2: | Fax call |

Values when CmdType=5 (Play tone)**<ToneType>**

| | |
|-----|---------------------|
| 0: | Tone Dial. |
| 1: | Tone Busy. |
| 2: | Tone Congestion. |
| 3: | Tone Radio ack |
| 4: | Tone Dropped. |
| 5: | Tone Error. |
| 6: | Tone Call waiting. |
| 7: | Tone Ringing. |
| 8: | Tone General beep. |
| 9: | Tone Positive beep. |
| 10: | Tone Negative beep. |

<TimeUnit>

- 0: Time unit used is minutes.
- 1: Time unit used is seconds.
- 2: Time unit used is tenths of seconds.

<TimeInterval> (1-255) Time required expressed in units.**<TextInfo>** Text information in ASCII format.

Values when CmdType=6 (Sel Item)

| | |
|-------------------------------|--|
| <DefaultItem> (1-255) | Default Item Identifier. |
| <Alpha Identifier menu> | Alpha identifier of the main menu. |
| <Idx> (1-255) | Identifier items. |
| <NbItems> (1-255) | Number of items in the menu. |
| <Alpha Idx Label> | Alpha identifier label of items in ASCII format. |
| <HelpInfo> | |
| 0: | No help information available. |
| 1: | Help information available. |
| <NextActionId> | Contains a pro-active command identifier. |
| (see the table in APPENDIX D) | |

Values when CmdType=7 (Refresh)

<RefreshType>

| | |
|----|---|
| 0: | SIM initialization and full file change notification. |
| 1 | File change notification. |
| 2 | SIM initialization and file change notification. |
| 3 | SIM initialization. |
| 4 | SIM reset. |

Values when CmdType=8 (Send SS)

<TextInfo> Text information in ASCII format.

Values when CmdType=9 (Send SMS)

<TextInfo> Text information in ASCII format.

Values when CmdType=10 (Send USSD)

<TextInfo> Text information in ASCII format.

Values when CmdType=11 (Setup Event List)

<Evt>

| | |
|----|---|
| 1: | Reporting asked for an 'Idle Screen' event. |
| 2: | Reporting asked for an 'User Activity' event. |
| 3: | Reporting asked for 'Idle Screen' and 'User Activity' events. |
| 4: | Cancellation of reporting event. |

Rem : For the UCS2 format texts are displayed in Hexa Ascii format. Example : When the SIM sends a TextString containing 0x00 0x41 the text displayed is "0041".

16.3.3.4 Error codes

- + CME ERROR: 3 **Operation not allowed.** This error is returned when a wrong parameter is detected.
- +CME ERROR: 4 **Operation not supported.** This error is returned when the user wants to get information about a SIM Toolkit proactive command (with SIM Toolkit functionality not activated.)
- +CME ERROR: 518 **SIM Toolkit indication not received.** This error is returned when the SIM Toolkit indication (+STIN) has not been received.

16.3.3.5 Example

Initially, all facilities are activated, the PIN is not required and SIM toolkit functionality is activated.

```

AT+CMEE=1                    Enable the reporting of mobile equipment errors
OK
AT+WIND=15                   Set CENTEL indications
OK
AT+STSF?
+STSF: 1,"5FFFFFFF7F",3      SIM Toolkit functionality activated with all facilities.
OK
+STIN: 0                     The main menu has been sent from the SIM.
AT+STIN?
+STIN: 0
OK
AT+STGI=0                    Get information about the main menu
+STGI: "SIM TOOLKIT MAIN MENU" Main menu contains 3 items.
+STGI: 1,3,"BANK",0
+STGI: 2,3,"QUIZ",0
+STGI: 3,3,"WEATHER",0
OK
AT+STIN?
+CME ERROR: 4

```

16.3.4 Unsolicited Result : SIM ToolKit Control Response (+STCR)

When the customer application makes an outgoing call or an outgoing SMS and if the call control facility is activated, CALL CONTROL and SMS CONTROL responses can be identified. This is also applicable to SS calls.

Syntax : +STCR: <Result>[,<Number>,<MODestAddr>,<TextInfo>]

Option :

<Result>

- 0: Control response not allowed.
- 1: Control response with modification.

<Number> Called number, Service Center Address or SS String in ASCII format.

<MODestAddr> MO destination address in ASCII format.

<TextInfo> Text information in ASCII format.

16.3.5 SIM ToolKit Give Response (+STGR)

16.3.5.1 Description

This command allows the application/user to select an item in the main menu, or to answer the following proactive commands :

- GET INKEY Key pressed by the user.
- GET INPUT Message entered by the user.
- SELECT ITEM Selected item.
- SETUP CALL User confirmation.
- DISPLAY TEXT User confirmation to clear the message.
- SETUP EVENT LIST Reporting events.

It is also possible to terminate the current proactive command session by sending a Terminal Response to the SIM, with the following parameters :

- BACKWARD MOVE Process a backward move
- BEYOND CAPABILITIES Command beyond ME capabilities
- UNABLE TO PROCESS ME is currently unable to process command
- NO RESPONSE No response from the user
- END SESSION User abort.

16.3.5.2 Syntax

Command syntax : +STGR=<CmdType>[,<Result>,<Data>]

| Command | Possible responses |
|--|-------------------------|
| +STGR=<CmdType>[,<Result>,<Data>] | OK +CME ERROR: <err> |
| For GetInput with <Result>=1: +STGR=3,1<CR> <Data><Ctrl Z> | OK +CME ERROR: <err> |
| For GetInkey with <Result>=1 +STGR=2,1,.<Data>. | OK +CME ERROR: <err> |
| +STGR=? | OK |

16.3.5.3 Defined values

<CmdType>

Item selection in the main menu.

0:

- 1:** User confirmation to clear a 'Disp Text'.
- 2:** Response for a 'Get Inkey'.
- 3:** Response for a 'Get Input'.
- 4:** Response for a 'Setup call'.
- 6:** Response for a 'Sel Item'.
- 11** Reponse for a 'Setup event list'.
- 95** Backward move
- 96** Command beyond ME capabilities
- 97** ME currently unable to process command
- 98** No response from the user.
- 99** User abort.

Values when CmdType=0 (Select an item from the main menu)

<Result>

- 1:** Item selected by the user.
- 2:** Help information required by user.

<Data> Contains the item identifier of the item selected by the user.

Values when CmdType=1 (Confirm the display text clearing)

No values.

Values when CmdType=2 (Get Inkey)

<Result>

- 0:** Session ended by user.
- 1:** Response given by the user.
- 2:** Help information required by user.

<Data> Contains the key pressed by the user.

Values when CmdType=3 (Get Input)**<Result>**

- 0: Session ended by user.
- 1: Response given by the user.
- 2: Help information required by user.

<Data> Contains the string of characters entered by the user.

Note:

For Inputs in UCS2 format, the data are entered in ASCII format. Example : For "8000410042FFFF"entered, the SIM receives 0x000x41 0x00 0x42 with UCS2 DCS. (See the Appendix E about the different UCS2 syntaxes).

Values when CmdType=4 (Setup call)**<Result>**

- 0: User refuses the call.
- 1: User accepts call.

Values when CmdType=6 (Select Item)**<Result>**

- 0: Session terminated by the user
- 1: Item selected by the user
- 2: Help information required by the user
- 3: Return to the back item

<Data> Contains the item identifier selected by the user

Values when CmdType=11 (Setup Event List)**<Result>**

- 1: Idle screen available.
- 2: User activity event.

Sending a Terminal Response to the SIM :

Values when CmdType=95 (Backward Move)

Values when CmdType=96 (Command beyond ME capabilities)

Values when CmdType=97 (ME currently unable to process command)

Values when CmdType=98 (No response from the user)

Values when CmdType=99 (SIM Toolkit Session aborting by the user)

No values.

It is possible to send a Terminal Response after the +STIN indication (step 2, cf § 16.2), or after the +STGI command (step 3).

Note :

For the SETUP MENU Proactive Command, it is only possible to send a Terminal Response after the +STIN: 0 indication, not after a +STGI=0request.

All of the Terminal Responses are not possible with all of the Proactive Commands. Compatibility between available Terminal Responses and Proactive Commands is given in Appendix B, Table 2. If a Terminal Response is attempted during a incompatible Proactive Command session, a +CME ERROR: 3 will be returned.

16.3.5.4 Possible error codes

- + CME ERROR: 3 **Operation not allowed.** This error is returned when a wrong parameter is detected.
- +CME ERROR: 4 **Operation not supported.** This error is returned when the user gives a response with SIM ToolKit functionality not activated. Or if the SIM Toolkit indication (+STIN) has not been received.

16.3.5.5 Example

Initially, all facilities are activated, the PIN is not required and the SIM toolkit functionality is activated.

| | |
|---|--|
| +STIN: 0 | The main menu has been sent from the SIM. |
| AT+STGI=0 | Get information about the main menu |
| +STGI: 1,3,"BANK",0 | The main menu contains 3 items. |
| +STGI: 2,3,"QUIZ",0 | |
| +STGI: 3,3,"WEATHER",0 | |
| OK | |
| AT+STGR=0,1,1 | The item 2 of the main menu has been selected. |
| OK | |
| +STIN: 6 | The Sel item menu has been sent from the SIM. |
| AT+STGI=6 | Get information about the BANK menu |
| +STGI: 1,"BANK" | The BANK menu contains two items. |
| +STGI: 1,2,"PERSONAL ACCOUNT ENQUIRY",1 | |
| +STGI: 2,2,"NEWS",0 | |
| OK | |
| AT+STGR=6,1,1 | Select Item 1. |
| OK | |
| +STIN: 3 | User request to enter Password sent. |
| AT+STGI=3 | Get information about this request. |
| +STGI: 0,0,4,4,0,"Enter Account Password:" | |
| OK | |
| AT+STGR=3,1<CR> | The user enters the Password. |
| >0000<Ctrl Z> | |
| OK | |
| +STIN:1 | A text info has been sent from the SIM. |
| AT+STGI=1 | Get information about this text. |
| +STGI: 0,"Password correct, please wait for response",0 | |
| OK | |
| +STIN: 9 | SIM requests a bank account update from bank server via the network (SEND SMS) |
| AT+STGI=9 | Get all information about the SEND SMS |
| +STGI: "Send account balance of user, authorization ok" | |
| OK | |

***** After a short period of time. *****
+STIN: 5 Transaction is complete: BEEP
+STGI=5 Get information about the Tone
+STGI: 9,1,1
+STIN: 1 Display text indication
AT+STGI=1
+STGI: 0,"Your account balance is 1000 \$",0
OK

17 GPRS commands

GPRS commands are not available under GSM-only software.

17.1 Define PDP Context +CGDCONT

17.1.1 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 CENTEL software.

A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

17.1.2 Syntax

| Command | Possible response(s) |
|---|---|
| AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp>]]]]]] | OK ERROR |
| AT+CGDCONT? | +CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <data_comp>, <head_comp> [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <data_comp>, <head_comp> [...]] OK |
| AT+CGDCONT=? | +CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s) [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s) [...]] OK |
| AT+CGDCONT: 1, "IP", "internet"; +CGDCONT=2, "IP", "abc.com" | OK |
| AT+CGDCONT=? | +CGDCONT : (1-4),"IP",,,(0-1),(0-1) +CGDCONT : (1-4),"PPP",,0,0 OK |

17.1.3 Defined values

<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. Range of values is 1 to 4.

<PDP_type>: (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

- IP: Internet Protocol
- PPP : Point to Point Protocol

<APN>: (Access Point Name) a string parameter, which is a logical name that is used to select the GGSN or the external packet data network.

If the value is null or omitted, then the subscription value will be requested.

<PDP_address>: a string parameter that identifies the MT in the address space applicable to the PDP.

If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, a dynamic address will be requested. The read form of the command will return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the **+CGPADDR** command.

<d_comp>: a numeric parameter that controls PDP data compression

- 0 : OFF (default if value is omitted)
- 1 : ON
- Other values are reserved.

<h_comp>: a numeric parameter that controls PDP header compression

- 0 : OFF (default if value is omitted)
- 1 : ON
- Other values are reserved.

Notes :

- The data compression algorithm provided in SNDCP is V.42bis.
- 4 cids are available to specify 4 PDP contexts but only 11 NSAPI are available for PDP activation. Due to CENTEL Choice, 4 PDP contexts can be specified with only one activated at the same time.

17.2 Quality of Service Profile (Requested) +CGQREQ

17.2.1 Description

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT command, the +CGQREQ command is effectively an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

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

The read command returns the current settings for each defined context. The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

17.2.2 Syntax

| Command | Possible Response(s) |
|---|---|
| AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]] | OK ERROR |
| AT+CGQREQ? | +CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> [...]] OK |
| AT+CGQREQ=? | +CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [...] OK |
| AT +CGQREQ=1,1,4,5,2,14 | OK |
| AT+CGQREQ=? | +CGQREQ:"IP",(1-3),(1-4),(1-5),(1-9),(1-31) +CGQREQ:"PPP",(1-3),(1-4),(1-5),(1-9),(1-31) OK |
| AT+CGQREQ? | +CGQREQ: 1,1,4,5,2,14 OK |

17.2.3 Defined values

<cid>: numeric parameter which specifies a particular PDP context definition. Range of values is 1 to 3

<precedence>: numeric parameter which specifies the precedence class

- 0 : Subscribed precedence (Subscribed by the Network by default if value is omitted)
- 1 : High priority (Service commitments shall be maintained ahead of precedence classes 2 and 3)
- 2 : Normal priority (Service commitments shall be maintained ahead of precedence class 3.)
- 3 : Low priority (Service commitments shall be maintained after precedence classes 1 and 2)

<delay>: numeric parameter which specifies the delay class

- 0 : Subscribed
- 1 : Delay class 1
- 2 : Delay class 2
- 3 : Delay class 3
- 4 : Delay class 4

| Delay Class | Delay (maximum values) |
|-------------|------------------------|
|-------------|------------------------|

| | SDU size: 128 bytes | | SDU size: 1024 bytes | |
|------------------|---------------------------|---|---------------------------|---------------------------|
| | Mean Transfer Delay (sec) | 95 percentile Delay (sec) | Mean Transfer Delay (sec) | 95 percentile Delay (sec) |
| 1. (Predictive) | Subscribed | Subscribed by the Nwk / default if value is omitted | | |
| | < 0.5 | | < 2 | < 7 |
| 2. (Predictive) | < 5 | < 25 | < 15 | < 75 |
| 3. (Predictive) | < 50 | < 250 | < 75 | < 375 |
| 4. (Best Effort) | Unspecified | | | |

<reliability>: numeric parameter which specifies the reliability class

- 0 : Subscribed
- 1 : Up to 1 000 (8 kbit/s).
- 2 : Up to 2 000 (16 kbit/s).
- 3 : Up to 4 000 (32 kbit/s).
- 4 : Up to 8 000 (64 kbit/s).
- 5 : Up to 16 000 (128 kbit/s).
- 6 : Up to 32 000 (256 kbit/s).
- 7 : Up to 64 000 (512 kbit/s).
- 8 : Up to 128 000 (1 024 kbit/s).
- 9 : Up to 256 000 (2 048 kbit/s).

| Reliability Class | GTP Mode | LLC Frame Mode | LLC Data Protection | RLC Block Mode | Traffic Type |
|-------------------|----------------|---|---------------------|----------------|---|
| 0 | Subscribed | Subscribed by the Nwk / default if value is omitted | | | |
| 1 | Acknowledged | Acknowledged | Protected | Acknowledged | Non real-time traffic, error-sensitive application that cannot cope with data loss. |
| 2 | Unacknowledged | Acknowledged | Protected | Acknowledged | Non real-time traffic, error-sensitive application that can cope with infrequent data loss. |
| 3 | Unacknowledged | Unacknowledged | Protected | Acknowledged | Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS. |
| 4 | Unacknowledged | Unacknowledged | Protected | Unacknowledged | Real-time traffic, error-sensitive application that can cope with data loss. |
| 5 | Unacknowledged | Unacknowledged | Unprotected | Unacknowledged | Real-time traffic, error non-sensitive application that can cope with data loss. |

NOTE: For real-time traffic, the QoS profile also requires appropriate settings for delay and throughput.

<peak>: numeric parameter which specifies the peak throughput class

- 0 : Subscribed
- 1 : Up to 1 000 (8 kbit/s).
- 2 : Up to 2 000 (16 kbit/s).
- 3 : Up to 4 000 (32 kbit/s).
- 4 : Up to 8 000 (64 kbit/s).
- 5 : Up to 16 000 (128 kbit/s).
- 6 : Up to 32 000 (256 kbit/s).
- 7 : Up to 64 000 (512 kbit/s).
- 8 : Up to 128 000 (1 024 kbit/s).
- 9 : Up to 256 000 (2 048 kbit/s).

<mean>: numeric parameter which specifies the mean throughput class

0 : Subscribed by the Nwk / default if value is omitted

1 : 100 (~0.22 bit/s).

2 : 200 (~0.44 bit/s).

3 : 500 (~1.11 bit/s).

4 : 1 000 (~2.2 bit/s).

5 : 2 000 (~4.4 bit/s).

6 : 5 000 (~11.1 bit/s).

7 : 10 000 (~22 bit/s).

8 : 20 000 (~44 bit/s).

9 : 50 000 (~111 bit/s).

10 : 100 000 (~0.22 kbit/s).

11 : 200 000 (~0.44 kbit/s).

12 : 500 000 (~1.11 kbit/s).

13 : 1 000 000 (~2.2 kbit/s).

14 : 2 000 000 (~4.4 kbit/s).

15 : 5 000 000 (~11.1 kbit/s).

16 : 10 000 000 (~22 kbit/s).

17 : 20 000 000 (~44 kbit/s).

18 : 50 000 000 (~111 kbit/s).

31 : Best effort.

If a value is omitted for a particular class, then it is considered to be unspecified.

17.3 Quality of Service Profile (Minimum acceptable) +CGQMIN

17.3.1 Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the **+CGDCONT** command, the +CGQMIN command is an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

17.3.2 Syntax

| Command | Possible Response(s) |
|--|---|
| AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]] | OK ERROR |
| AT+CGQMIN? | +CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> [...]] OK |
| AT+CGQMIN=? | +CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [...]] OK |
| AT +CGQMIN=1,1,4,5,2,31 | OK |
| AT+CGQMIN=? | +CGQMIN:"IP",(1-3),(1-4),(1-5),(1-9),(1-31) +CGQMIN:"PPP",(1-3),(1-4),(1-5),(1-9),(1-31) OK |
| AT+CGQMIN? | +CGQMIN: 1,1,4,5,2,14 OK |

17.3.3 Defined values

<cid>: a numeric parameter which specifies a particular PDP context .

<precedence>: a numeric parameter which specifies the precedence class.

<delay>: a numeric parameter which specifies the delay class.

<reliability>: a numeric parameter which specifies the reliability class.

<peak>: a numeric parameter which specifies the peak throughput class.

<mean>: a numeric parameter which specifies the mean throughput class. If a value is omitted for a particular class then this class is not checked.

17.4 GPRS attach or detach +CGATT

17.4.1 Description

The execution command is used to attach the MT to, or detach the MT from the GPRS service. After the command has completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved because the GPRS is not supported by the an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

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

The read command returns the current GPRS service state.
The test command is used for requesting information on the supported GPRS service states.

17.4.2 Syntax

| Command | Possible Response(s) |
|---------------------|--|
| AT+CGATT= [<state>] | OK ERROR |
| AT+CGATT? | +CGATT: <state> OK |
| AT+CGATT=? | +CGATT: (list of supported <state>s) OK |
| AT +CGATT=1 | OK |

17.4.3 Defined Values

<state>: indicates the state of GPRS attachment

- 0 : detached
- 1 : attached
- Other values are reserved and will result in an ERROR response to the execution command.

17.5 PDP context activate or deactivate +CGACT

17.5.1 Description

The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged.

If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

If the MT is not GPRS attached when the activation form of the command is executed, the MT first performs a GPRS attach and then attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

If no <cid>s are specified the activation form of the command activates the first activable defined contexts.

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

One PDP contexts can be activated through CENTEL software at the same time.

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

17.5.2 Syntax

| Command | Possible Response(s) |
|---|---|
| AT+CGACT=[<state> [,<cid>[,<cid>[,...]]]] | OK ERROR |
| AT+CGACT? | +CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]] OK |
| AT+CGACT=? | +CGACT: (list of supported <state>s) OK |
| AT +CGACT=1,1 | OK |
| AT+CGACT? | +CGACT: 1, 1 OK |
| AT+CGACT=? | +CGACT: (0-1) OK |

17.5.3 Defined Values

<state>: indicates the state of PDP context activation

- 0 : deactivated
- 1 : activated
- Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context.

Before the activation of the context, the MT has to attached himself to the GPRS network if necessary.

17.6 Enter data state +CGDATA

17.6.1 Description

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

If the <cid> value is not defined to the MT, it will return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.25ter online data state.

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 no <cid> is given, the MT attempts to activate the context with available information. The other context parameters are set to their default values (No APN, default QOS parameters, dynamic IP address requested).

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 MT returns the final result code OK.

In case of abnormal termination or start up, the V.25ter command state is reentered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.

This command may be used in both normal and modem compatibility modes.

Remark : This command has the same effects than ATD*99***.

17.6.2 Syntax

| Command | Possible Response(s) |
|-------------------|----------------------|
| AT+CGDATA=[<cid>] | CONNECT ERROR |
| AT+CGDATA=? | +CGDATA: OK |
| AT+CGDATA=? | +CGDATA: OK |
| AT +CGDATA=1 | CONNECT |

17.6.3 Defined Values

<cid>: a numeric parameter which specifies a particular PDP context definition.

17.7 GPRS mobile station class +CGCLASS

17.7.1 Description

The set command is used to set the MT to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned.

The read command returns the current GPRS mobile class.

The test command is used for requesting information on the supported GPRS mobile classes.

17.7.2 Syntax

| Command | Possible Response(s) |
|---|--|
| AT+CGCLASS= [<class>] | OK ERROR |
| AT+CGCLASS? | +CGCLASS: <class> OK |
| AT+CGCLASS=? | +CGCLASS: (list of supported <class>s) OK |
| AT +CGCLASS="CG" Note : EnterGPRS class Cmode | OK |
| AT +CGCLASS="CC" Note : EnterGSMmode | OK |
| AT +CGCLASS="A" Note : Chosen class not supported. | +CME ERROR: 150 |
| AT+CGCLASS=? | +CGCLASS: ("CG","CC") OK |
| AT+CGCLASS? | +CGCLASS: "CC" OK |

17.7.3 Defined Values

<class>: a string parameter which indicates the GPRS mobile class (in descending order of functionality)

- A class A (highest)
- B class B
- CG class C in GPRS only mode
- CC class C in circuit switched only mode (lowest)

Other values are reserved and will result in an ERROR response to the set command.

If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a GPRS detach request is sent to the network.

If the MT is GSM attached when the set command is issued with a <class> = CG specified, a GSM detach request is sent to the network.

Class A is not supported by CENTEL GPRS software.

Remark : During switch-On in CG class, the MS always performs an automatic GPRS attach (the ATTACH-STATUS parameter of +WGPRS is ignored).
But if the MS is not already GPRS attached when switching from B/CC class to CG class then no automatic GPRS attach is performed.

Example about automatic attachment (see remark above) :

```
AT+CGCLASS?  
+CGCLASS: "B"  
OK  
AT+CGATT?  
+CGATT: 0  
OK  
AT+CGCLASS="CG"  
OK  
AT+CGATT?  
+CGATT: 0  
OK  
AT+CGATT=1  
OK  
AT+CPOF  
OK  
AT+CFUN=1  
OK  
AT+CGCLASS?  
+CGCLASS: "CG"  
OK  
AT+CGATT?  
+CGATT: 1  
OK
```

17.8 Select service for MO SMS messages +CGSMS

17.8.1 Description

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

17.8.2 Syntax

| Command | Possible Response(s) |
|---------------------|---|
| +CGSMS= [<service>] | OK ERROR |
| +CGSMS? | +CGSMS: <service> OK |
| +CGSMS=? | +CGSMS: (list of currently available <service>s) OK |
| AT +CGSMS=0 | OK |
| AT+CGSMS=? | +CGSMS: (0-3) OK |

17.8.3 Defined Values

<service>: a numeric parameter which indicates the service or service preference to be used

- 0 : GPRS
- 1 : Circuit switched
- 2 : GPRS preferred (use circuit switched if GPRS is not available)
- 3 : Circuit switched preferred (use GPRS if circuit switched not available)
- Other values are reserved and will result in an ERROR response to the set command.

17.9 GPRS event reporting +CGEREP

17.9.1 Description

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the GPRS MT or the network.

<mode> controls the processing of unsolicited result codes specified within this command.

Read command returns the current mode and buffer settings

Test command returns the modes and buffer settings supported by the MT as compound values.

17.9.2 Syntax

| Command | Possible response(s) |
|------------------|--|
| +CGEREP=[<mode>] | OK ERROR |
| +CGEREP? | +CGEREP: <mode>,<bfr> OK |
| +CGEREP=? | +CGEREP: (list of supported <mode>s), (list of supported <bfr>s) OK |

17.9.3 Defined values

<mode>:

- 0 : buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
- 2 : buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE

<bfr>

- 0 : MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 entered. Only this case is supported by CENTEL.
- 1 : MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 2 is entered. This case is not supported by CENTEL.

With CENTEL's software, a combination of all modes is implemented. When serial link is available, indications are forwarded directly to the TE. If serial link is reserved (e.g. in on-line data mode), if MT result code buffer is full, the oldest ones can be discarded.

Defined events

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

+CGEV: REJECT <PDP_type>, <PDP_addr>

A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.

+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]

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

+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]

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

+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]

The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV: NW DETACH

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

+CGEV: ME DETACH

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

+CGEV: NW CLASS <class>

The network has forced a change of MS class. The highest available class is reported.

+CGEV: ME CLASS <class>

The mobile equipment has forced a change of MS class. The highest available class is reported.

17.10 GPRS network registration status +CGREG

17.10.1 Description

The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>] when <n>=2 and there is a change of the network cell.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac> and <ci> are returned only when <n>=2 and MT is registered in the network.

17.10.2 Syntax

| Command | Possible response(s) |
|----------------|--|
| AT+CGREG=[<n>] | OK +CGREG: stat>[,<lac>,<ci>] |
| AT+CGREG? | +CGREG: <n>,<stat>[,<lac>,<ci>] OK +CME ERROR: <err> |
| AT+CGREG=? | +CGREG: (list of supported <n>s) OK |

17.10.3 Defined values

<n>:

- 0 : disable network registration unsolicited result code
- 1 : enable network registration unsolicited result code +CGREG: <stat>
- 2 : enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>]

<stat>:

- 0 : not registered, ME is not currently searching a new operator to register to
- 1 : registered, home network
- 2 : not registered, but ME is currently searching a new operator to register to
- 3 : registration denied
- 4 : unknown
- 5 : registered, roaming

<lac>:

string type; two byte location area code in hexadecimal format.

<ci>:

string type; two byte cell ID in hexadecimal format

17.11 Request GPRS IP service 'D'

17.11.1 Description

This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN.

The V.25ter 'D' (Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocol. The MT return 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 behaviour 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.

If <cid> is supported, its usage is the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may then be used in the modem initialisation AT command string to set values for for PDP type, APN, QoS etc...

If <cid> is not supported or is supported but omitted, the MT attempt to activate the context using the 'Empty PDP type' (GSM 04.08). (No PDP address or APN is sent in this case and only one PDP context subscription record is present in the HLR for this subscriber.)

17.11.2 Syntax

| Command | Possible Response(s) |
|-------------------------------|----------------------|
| D* <GPRS_SC_IP> [*** <cid>] # | CONNECT ERROR |

17.11.3 Defined Values

<GPRS_SC_IP>: (GPRS Service Code for IP) a digit string (value 99), which identifies a request to use the GPRS with IP (PDP types IP and PPP)

<cid>: a digit string which specifies a particular PDP context definition.

Example

```
ATD*99***1#
CONNECT
ATD*99***2#
ERROR
```

17.12 Network requested PDP context activation

In this mode of operation, the MT behaves like an answering modem and accepts the normal V.25ter commands associated with answering a call. If GPRS-specific configuration commands are required, they may be sent to the MT as part of the modem initialisation commands. The +CGAUTO command is used to select modem compatibility mode.

17.12.1 Automatic response to a network request for PDP context activation 'S0'

The V.25ter 'S0=n' (Automatic answer) command may be used to turn off (n=0) and on (n>0) the automatic response to a network request for a PDP context activation.

When the 'S0=n' (n>0) command is received, the MT attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code RING to the TE, followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

NOTE. The 'S0=n' (n=0) command does not perform an automatic GPRS detach.

17.12.2 Manual acceptance of a network request for PDP context activation 'A'

The V.25ter 'A' (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING. The MT responds with CONNECT, enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <cid> value specified. It is an error to issue the 'A' command when there is no outstanding network request.

17.12.3 Manual rejection of a network request for PDP context activation 'H'

The V.25ter 'H' or 'H0' (On-hook) command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING. The MT responds with OK. It is an error to issue the 'H' command when there is no outstanding network request.

NOTE: This is an extension to the usage of the 'H' command that is described in ITU-T V.25ter.

17.13 Automatic response to a network request for PDP context activation +CGAUTO

17.13.1 Description

The set command disables or enables an automatic positive response (autoanswer) to the receipt of a Request PDP Context Activation message from the network. It also provides control over the use of the V.25ter basic commands 'S0', 'A' and 'H' for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.

The test command returns values of <n> supported by the MT as a compound value.

When the +CGAUTO=0 command is received, the MT will not perform a GPRS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request.

When the +CGAUTO=1 command is received, the MT will attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with <cid> values specified.

17.13.2 Syntax

| Command | Possible response(s) |
|-------------|----------------------|
| +CGAUTO=<n> | OK ERROR |
| +CGAUTO? | +CGAUTO: <n> OK |
| +CGAUTO=? | +CGAUTO: (0-3) OK |

17.13.3 Defined values

<n>:

- 0 turn off automatic response for GPRS only
- 1 turn on automatic response for GPRS only
- 2 modem compatibility mode, GPRS only
- 3 modem compatibility mode, GPRS and circuit switched calls (default)

For <n> = 0 GPRS network requests are manually accepted or rejected by the +CGANS command.

For <n> = 1 GPRS network requests are automatically accepted according to the description above.

For <n> = 2, automatic acceptance of GPRS network requests is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Incoming circuit switched calls can be neither manually nor automatically answered.

For <n> = 3, automatic acceptance of both GPRS network requests and incoming circuit switched calls is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Circuit switched calls are handled as described elsewhere in this specification.

NOTE. In class C GPRS the modem can't receive simultaneously GPRS and GSM incoming calls.

Example

```
AT+CGAUTO=?  
+CGAUTO: (0-2)  
OK
```

```
AT+CGAUTO?  
+CGAUTO: 2  
OK
```

```
AT+CGAUTO=0  
OK
```

17.14 Manual response to a network request for PDP context activation +CGANS

17.14.1 Description

The execution command requests the MT to respond to a network request for GPRS PDP context activation which has been signalled to the TE by the RING or +CRING: unsolicited result code. The <response> parameter allows the TE to accept or reject the request.

If <response> is 0, the request is rejected and the MT returns OK to the TE.

If <response> is 1, the following procedure is followed by the MT.

PDP context activation procedures take place prior to or during the PDP startup.

One <cid> may be specified in order to provide the values needed for the context activation request.

During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message.

If a <cid> is given his informations must matching with the PDP type and PDP address in the network request as follows –

The PDP type must match exactly.

The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

If any of this information is in conflict, the command will fail.

The context is activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition. An APN may or may not be required, depending on the application.

If no <cid> is given, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the MT returns the final result code OK

In the event of an erroneous termination or a failure to startup, the V.25ter command state is re-entered and the MT returns the final result code

NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported. It is also an error to issue the +CGANS command when there is no outstanding network request.

This command may be used in both normal and modem compatibility modes.

17.14.2 Syntax

| Command | Possible response(s) |
|------------------------------|---|
| +CGANS=[<response>, [<cid>]] | OK ERROR |
| +CGANS=? | +CGANS: (list of supported <response>s), (list of supported <L2P>s) OK |

17.14.3 Defined values

<response>: is a numeric parameter which specifies how the request should be responded to.

0 reject the request

1 accept and request that the PDP context be activated

If <response> is omitted it is assumed to be 0. Other values are reserved and will result in the ERROR response.

<cid>: a numeric parameter which specifies a particular PDP context definition.

Example

```
+CRING: GPRS "IP", "122.41.74.238"
```

```
AT+CGANS=1
```

```
CONNECT
```

```
AT+CGANS=?
```

```
+CGANS: (0-1)
```

```
OK
```

17.15 Show PDP address +CGPADDR

17.15.1 Description

The execution command returns a list of PDP addresses for the specified context identifiers.

The test command returns a list of defined <cid>s

17.15.2 Syntax

| Command | Possible response(s) |
|---------------------------------|---|
| +CGPADDR=[<cid> [,<cid> [...]]] | +CGPADDR: <cid>,<PDP_addr> [<CR><LF>+CGPADDR: <cid>,<PDP_addr> [...]] OK |
| +CGPADDR=? | +CGPADDR: (list of defined <cid>s) OK |

17.15.3 Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition. If no <cid> is specified, the addresses for all defined contexts are returned.

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

Example

In this example 3 Cids are defined.

```
AT+CGPADDR=1
+CGPADDR=1,"107.210.5.4"
OK
```

```
AT+CGPADDR=?
+CGPADDR: (1,2,4)
OK
```

```
AT+CGPADDR
+CGPADDR: 1,
+CGPADDR: 2,"10.3.73.151"
+CGPADDR: 4,
```

17.16 Cellular result codes +CRC

17.16.1 Description :

This command enables a more detailed ring indication, in case of incoming call (voice or data). Instead of the string "RING", an extended string is used to indicate which type of call is ringing (e.g. +CRING: VOICE).

These extended indications are :

| | |
|------------------|---|
| +CRING: ASYNC | for asynchronous transparent |
| +CRING: RELASYNC | for asynchronous non-transparent |
| +CRING: VOICE | for normal speech. |
| +CRING : FAX | for fax calls |
| +CRING: GPRS | GPRS network request for PDP context activation |

If the MT is unable to announce to the TE the network's request (for example it is in V.25ter online data state) the MT rejects the request. No corresponding unsolicited result code is issued when the MT returns to a command state.

17.16.2 Syntax

See 11.5

17.16.3 Defined values

No parameter.

17.17 Service reporting control +CR

17.17.1 Description :

This command enables a more detailed service reporting, in case of data incoming or outgoing call. Before sending the CONNECT response to the application, the GSM module will precise the type of data connection that have been established.

These report types are :

| | |
|----------------|----------------------------------|
| +CR: ASYNC | For asynchronous transparent |
| +CR: REL ASYNC | For asynchronous non-transparent |
| +CR: GPRS | For GPRS |

17.17.2 Syntax

Command syntax : AT+CR

| Command | Possible responses |
|---|----------------------------|
| AT+CR=0 Note : Extended reports disabled | OK Note : Command valid |
| AT+CR=1 Note : Extended reports enabled | OK Note : Command valid |

17.17.3 Defined values

No parameter.

17.18 Extended error report +CEER

17.18.1 Description

This command gives the reason of the call release when the last call setup (originating or answering) failed.

New indication for GPRS is the reason of the last unsuccessful PDP context activation and the last GPRS detach or PDP context activation.

17.18.2 Syntax

Command syntax : AT+CEER

| Command | Possible responses |
|---|--|
| ATD123456789 ; Note : Outgoing voice call | NO CARRIER Note : Call setup failure |
| AT+CEER Note : Ask for reason of release | +CEER : Error <xxx> OK Note : <xxx>is the cause information element values form GSM recommendation 04.08 or specific Call accepted |

The cause information element from GSM 04.08 is given below in chapter 22 for specific GPRS failure causes.

The "NO CARRIER" indicates that the AT+CEER information is available for a failure diagnostic.

17.18.3 Defined values

No parameters.

17.19 GPRS PARAMETERS CUSTOMIZATION: +WGPRS

17.19.1 Description

This command modify some CENTEL GPRS parameters as the ATTACHSTATUS (the ME does or not perform automatically a GPRS attachment after initialisation), the PDP-INIT-STATUS (activate or not automatically some define PDP Contexts after initialisation) and the use or not of NAT (IP address translation on PPP).

In addition, this command permits to set automatically "ACTIVABLE" some define PDP contexts after init.

IMPORTANT NOTE : The Wismo must be rebooted to activate the new setup.

17.19.2 Syntax

Command syntax : AT+WGPRS

| Command | Possible responses |
|-------------------------------------|--|
| AT+WGPRS=<mode>,<parameter>,[<cid>] | OK ERROR |
| AT+WGPRS=? | +WGPRS: <mode>, <parameter1>,[<cid>] [<cr><lf>+wgprs: </cr><lf>+wgprs: <mode>, <parameter>,[<cid>] [...]] OK |
| AT+WGPRS? | +WGPRS:<mode>(list of supported <parameter>),[(list of supported <cid>)]<CR><LF>+WGPRS:<mode>(list of supported <parameter>),[(list of supported <cid>)] [...]] OK |

17.19.3 Defined Values

<mode>: a numeric parameter which specifies a CENTEL GPRS parameter.

- 0 : ATTACH-STATUS (the ME don't make automatically a GPRS attachment after init)
- 1 : PDP-INIT-STATUS (activate automatically some define PDP Contexts after init)
- 2 : Set ACTIVABLE automatically after init a define PDP context
- 3 : NAT

<parameter> : a numeric parameter that controls the <mode>

- 0 : OFF
- 1 : ON

<cid> : (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. Range of values is 1 to 32.

Remark

When the module is set in "CG" class, the ME always make automatically a GPRS attachment after init, so AT+WGPRS? always give +WGPRS: 0,0 for the parameter 0.

Example

```
AT+WGPRS=2,1,3
OK
AT+WGPRS=?
+WGPRS: (0-3),(0-1),(0-4)
OK
AT+WGPRS?
+WGPRS: 0,0
+WGPRS: 1,0
+WGPRS: 2,1,1
+WGPRS: 2,0,2
+WGPRS: 2,0,3
+WGPRS: 2,0,4
+WGPRS: 3,1
OK
<CR><LF>
```

17.20 GPRS service quality: +CGQREQ

17.20.1 Description

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network. The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT command, the +CGQREQ command is effectively an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

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

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The read command returns the current settings for each defined context.
 The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

IMPORTANT NOTE : The Wismo must be rebooted to activate the new setup.

17.20.2 Syntax

Command syntax : AT+CGQREQ

| Command | Possible responses |
|--|---|
| AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak>[,<mean>]]]]]] | OK ERROR |
| AT+CGQREQ=? | +CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [...]] OK |
| AT+CGQREQ? | +CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> [...]] OK |

17.20.3 Defined Values

<cid>: numeric parameter which specifies a particular PDP context definition.
Range of values is 1 to 3

<precedence>: numeric parameter which specifies the precedence class
0 : Subscribed precedence (Subscribed by the Network by default if value is omitted)

1 : High priority (Service commitments shall be maintained ahead of precedence classes 2 and 3)

2 : Normal priority (Service commitments shall be maintained ahead of precedence class 3.)

3 : Low priority (Service commitments shall be maintained after precedence classes 1 and 2)

<delay>: numeric parameter which specifies the delay class

0 : Subscribed

1 : Delay class 1

2 : Delay class 2

3 : Delay class 3

4 : Delay class 4

<reliability>: numeric parameter which specifies the reliability class

0 : Subscribed

1 : Up to 1 000 (8 kbit/s).

2 : Up to 2 000 (16 kbit/s).

3 : Up to 4 000 (32 kbit/s).

4 : Up to 8 000 (64 kbit/s).

5 : Up to 16 000 (128 kbit/s).

6 : Up to 32 000 (256 kbit/s).

7 : Up to 64 000 (512 kbit/s).

8 : Up to 128 000 (1 024 kbit/s).

9 : Up to 256 000 (2 048 kbit/s).

<peak>: numeric parameter which specifies the peak throughput class

0 : Subscribed

1 : Up to 1 000 (8 kbit/s).

2 : Up to 2 000 (16 kbit/s).

3 : Up to 4 000 (32 kbit/s).

4 : Up to 8 000 (64 kbit/s).

5 : Up to 16 000 (128 kbit/s).

6 : Up to 32 000 (256 kbit/s).

7 : Up to 64 000 (512 kbit/s).

8 : Up to 128 000 (1 024 kbit/s).

9 : Up to 256 000 (2 048 kbit/s).

<mean>: numeric parameter which specifies the mean throughput class

0 : Subscribed by the Nwk / default if value is omitted

1 : 100 (~0.22 bit/s).

2 : 200 (~0.44 bit/s).

3 : 500 (~1.11 bit/s).

4 : 1 000 (~2.2 bit/s).

5 : 2 000 (~4.4 bit/s).

6 : 5 000 (~11.1 bit/s).

7 : 10 000 (~22 bit/s).
 8 : 20 000 (~44 bit/s).
 9 : 50 000 (~111 bit/s).
 10 : 100 000 (~0.22 kbit/s).
 11 : 200 000 (~0.44 kbit/s).
 12 : 500 000 (~1.11 kbit/s).
 13 : 1 000 000 (~2.2 kbit/s).
 14 : 2 000 000 (~4.4 kbit/s).
 15 : 5 000 000 (~11.1 kbit/s).
 16 : 10 000 000 (~22 kbit/s).
 17 : 20 000 000 (~44 kbit/s).
 18 : 50 000 000 (~111 kbit/s).
 31 : Best effort.

17.21 QUALITY OF service Profile (Minimum acceptable) : +CGQMIN

17.21.1 Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT command, the +CGQMIN command is an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

17.18.2 Syntax

Command syntax : AT+CGQMIN

| Command | Possible responses |
|---|--|
| AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]] | OK ERROR |
| AT+CGQMIN? | +CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> [...]] OK |
| AT+CGQMIN=? | +CGQMIN: <PDP_type>, (list of supported |

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```

<precedence>s), (list of supported <delay>s),
(list of supported <reliability>s) , (list of
supported <peak>s), (list of supported
<mean>s)
[<CR><LF>+CGQMIN: <PDP_type>, (list of
supported <precedence>s), (list of supported
<delay>s), (list of supported <reliability>s) ,
(list
of supported <peak>s), (list of supported
<mean>s)
[...]]
OK

```

17.18.3 Defined values

<cid>: a numeric parameter which specifies a particular PDP context .
<precedence>: a numeric parameter which specifies the precedence class.
<delay>: a numeric parameter which specifies the delay class.
<reliability>: a numeric parameter which specifies the reliability class.
<peak>: a numeric parameter which specifies the peak throughput class.
<mean>: a numeric parameter which specifies the mean throughput class.
 If a value is omitted for a particular class then this class is not checked.

17.20 Full AT GPRS commands examples

17.20.1 Activation of an IP PDP context

Example 1 :

```
AT +CGDCONT=1, "IP", "internet"; +GCDCONT=2, "IP", "abc.com"
OK
ATD*99***1#
CONNECT
```

Example 2 :

```
AT +CGCLASS="CG"
OK
+CGREG: 1
AT +CGDCONT=1, "IP", "internet"
OK
AT +CGQREQ=1,1,4,5,2,14
OK
AT +CGQMIN=1,1,4,5,2,14
OK
AT +CGATT=1
OK
AT +CGACT=1,1
OK
```

Remark about +CGDATA :the goal of this command is the same than

```
ATD*99***
AT +CGDATA=1
CONNECT
.....
      Data transfer
.....
+CGEV: NW DETACH
```

17.20.2 Network request

```
AT+CGAUTO=0
OK
+CRING: GPRS "IP", "211.45.89.152"
AT+CGANS=1
CONNECT
.....Data transfer
```

18. TCP/IP

18.1 AT+ CIPSTART

| AT+CIPSTART Start up a connection | |
|--|---|
| | Response |
| | This Command will start the process of establishing a connection. there are two kinds of connection: TCP And UDP. For establishing a connection, it is necessary to know IP address or Domain name and port of remote server. |
| | 1) If format is right OK |
| AT+ CIPSTART | Otherwise |
| = "TCP"/"UDP",IP_AD | ERROR |
| DRESS/"DOMAIN_NA | 2) If Connection is established Successfully |
| ME",PORT | CONNECT OK |
| | Otherwise |
| | CONNECT FAIL |
| | Parameter |
| | "TCP" / "UDP" : |
| | "TCP" Establish a TCP connection |
| | "UDP" Establish a UDP connection |
| | IP_ADDRESS: remote server IP address |
| | "DOMAIN_NAME": remote server Domain Name |
| | PORT: remote server port |
| Reference | Note |

18.2 AT+CIPSEND

| AT+CIPSEND Send data | |
|---------------------------------------|---|
| AT+CIPSEND<CR | Response |
| > | This Command is used to send data on the TCP or UDP connection that has been established already. Ctrl-Z is used as a termination symbol. |
| Back of ">", Text is entered <Ctrl-Z> | There are at most 1024 bytes that can be sent each time. |
| | 1) OK |
| | 2) If sending successfully SEND SUCCESS |
| | 3) If error is occurred SEND FAIL |
| | Response |
| | This command is used to send fixed length of data. in this way termination symbol is not used any more. |
| | 1) OK |

| | |
|---------------------------------|--|
| | 2) If sending successfully SEND SUCCESS |
| | 3) If error is occurred SEND FAIL |
| AT+ CIPSEND =< data length > | |
| | Parameter < data length > the length of data that would be sent |
| Reference | Note : length less than 1024 |

18.3 AT+CIPCLOSE

| | |
|--------------------|---|
| AT+CIPCLOSE | Close connection |
| Action command | Response |
| AT+ CIPCLOSE | |
| | This command is used to close TCP or UDP connection. After this command, data can not be sent or received any more. However, the PDP context is still active when connecting GPRS network and CSD is still connected when connecting GSM network. |
| | Parameter none |
| Reference | Note |

18.4 AT+CIPSHUT

| | |
|-------------------|---|
| AT+CIPSHUT | Detach from GPRS network |
| Action command | Response |
| AT+ CIPSHUT | |
| | This command is used to shut down connection After this command executed, it will generally get a different IP address when starting up a new connection. |
| | OK |
| | Parameter none |
| Reference | note |

18.5 AT+CLPORT

| | |
|---------------------|--|
| AT+CLPORT | Set local TCP or UDP port |
| AT+ CLPORT = | Response |
| "TCP"/"UDP", "PORT" | |
| T" | This command is used to set local port for connection. In default, Local port 2020 is used for TCP connection and 3030 is used for UDP connection. |
| | Parameter "TCP" : Set local TCP port |

| | |
|-----------|---|
| | "UDP": Set local UDP port |
| Reference | Note "PORT": port number range from 0 to 65535 |

18.6 AT+CSTT

| | |
|---|---|
| AT+CSTT Set APN, user name, password for GPRS attachment | |
| AT+ CSTT = | Response |
| <APN>, <USER ID>, <PASSWORD> | This command is used to set APN, user name and password for GPRS attachment OK |
| | Parameter APN= "CMNET" , access point name USER ID= " " , PASSWORD= " " |
| Reference | Note |

18.7 AT+CIICR

| | |
|--|---|
| AT+CIICR Attach to GPRS network | |
| Test command AT+ CIICR | Response |
| | This command is used to activate a PDP context or establish a CSD connection for wireless connection OK, |
| | Parameter none |
| Reference | Note |

18.8 AT+CIFSR

| | |
|--------------------------------------|--|
| AT+CIFSR Get local IP address | |
| Test command AT+ CIFSR | Response |
| | This command is used to get local IP address assigned by GPRS or GSM network If wireless connection has been established successfully: <IP Address> Otherwise OK |
| | Parameter none |
| Reference | Note |

18.9 AT+CIPSTATUS

| AT+CIPSTATUS Action command | Query Status Response |
|---------------------------------------|--|
| AT+ CIPSTATUS | This command is used to query current status of connection progress. |
| | State |
| 0 IP INITIAL | Initializing state |
| 1 IP START | starting state |
| 2 IP CONFIG | |
| 3 IP IND | activating PDPcontext/establishing CSD connection |
| 4 IP GPRSACT | PDP context activated/CSD connection established |
| 5 IP STATUS | local IP address got |
| 6 TCP/UDP CONNECTING | connecting |
| 7 IP CLOSE | connection closed |
| 8 CONNECT OK | TCP/UDP connection established |
| Reference | Note |

18.10 AT+CIPHEAD

| AT+CIPHEAD Test command | Set whether add a header to data received Response |
|-----------------------------------|---|
| AT+ CIPHEAD=? | +CIPHEAD:(0-NO HEADER,1-ADD HEADER) |
| AT+CIPHEAD? | OK Response <mode> OK |
| | Parameter See set command |
| | Response This command is used to add a header to data received from TCP/UDP connection,distinguishing data received by other way such as SMS OK, ERROR |

AT+ CIPHEAD =<
mode >

Parameter
<mode>

0 no header
1 set header,

Reference

Note
The header format is "+IPD(data length):"

18.11 AT+CIPATS

AT+ CIPATS Set auto send timer

Test command

Response

AT+ CIPATS=?

+CIPATS:(0-NOT AUTO SEND,1-AUTO SEND)

AT+ CIPATS =
<mode>,<time>

OK
Parameter
<mode>

0 not set timer of sending data
1 set timer of sending data

<time>

time of sending data timer. unit of second

Reference

Note

18.12 AT+CIPSPRT

AT+CIPSEND Set prompt of '>' when sending data

Test command

Response

AT+ CIPSPRT=?

+CIPSPRT: (0-NOT PROMPT,1-PROMPT)

AT+CIPSPRT?

OK
Parameter
See set command
Response
<send_prompt>

OK

AT+ CIPSPRT =
<send_prompt>

Parameter
See set command
Response
OK,
ERROR

Parameter
< send_prompt >

0 no prompt after issuing AT+CIPSEND command
1 with ">" prompt after issuing AT+CIPSEND command

Reference

Note

18.12 AT+CIPCSGP

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

带格式的：项目符号和编号

18.14 TCP/IP Examples

18.14.1 以 GPRS 方式连接到 SERVER 端 IP 地址并开始传送数据

1. AT+CIPCSGP=1,"CMNET"
2. AT+CIPSTART="TCP", 218.246.2.150,2020
3. AT+CIPSEND
4. AT+CIPCLOSE

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5. AT+CIPSHUT

18.14.2 以 CSD 方式连接到 SERVER 端 IP 地址并开始传送数据

1. AT+CIPCSGP=0,17201,172,172,2
2. AT+CIPSTART="TCP", 218.246.2.150,2020
3. AT+CIPSEND
4. AT+CIPCLOSE
5. AT+CIPSHUT

18.14.3 连接到 SERVER 端 UDP 地址并开始传送数据

1. AT+CIPSTART="UDP", 218.246.2.150,3030
2. AT+CIPSEND
3. AT+CIPCLOSE
4. AT+CIPSHUT

19 GSM string

19.1 Call forwarding

| description | Command | reponses |
|--|-------------------------------|--|
| Register and activate unconditional call forwarding | **21*PhoneNumber# | OK |
| Interrogate unconditional call forwarding | *#21# | +CCFC:0,1, "+8613911078256",145 OK |
| Active unconditional call forwarding. | *21# | OK |
| Deactivate unconditional call forwarding. | #21# | OK |
| Unregistered and deactivate unconditional call forwarding. | ##21# | OK |
| Register and activate unconditional call forwarding | **61*PhoneNumber*time# | OK |

| | | |
|---|--------------------------|--|
| Interrogate call forwarding on no answer. | *#61# | +CCFC: 0,1,"+8613911078256",145 OK +CCFC: 1,1,"+861064345558",145 OK |
| Active call forwarding on no answer | *61# | OK |
| Deactivate call forwarding on no answer. | #61# | OK |
| Unregistered and deactivate call forwarding on no answer. | ##61# | OK |
| Register and activate call forwarding on not reachable. | **62*PhoneNumber# | OK |
| Interrogate call forwarding on not reachable. | *#62# | +CCFC: 0,1,"+8613911078256",145 OK +CCFC: 1,1,"+8613911078256",145 OK |
| Active call forwarding on not reachable. | *62# | OK |
| Deactivate call forwarding on not reachable. | #62# | OK |
| Unregistered and deactivate call forwarding on not reachable. | ##62# | OK |
| Interrogate call forwarding on busy | *#67# | +CCFC: 0,1,"+8613911078256",145 OK +CCFC: 1,1,"+8613911078256",145 OK |
| Register and activate call forwarding on busy. | **67*PhoneNumber# | OK |
| Active call forwarding on busy | *67# | OK |
| Deactivate call forwarding on busy | #67# | OK |
| Unregistered and deactivate call forwarding on busy | ##67# | OK |

| | | |
|--|---------------|----|
| Unregistered and deactivate all call forwarding | ##002# | OK |
| Unregistered and deactivate all call forwarding | ##004# | OK |

19.2 Change/unlock password (PIN and PIN2)

| description | Command | PIML reponses |
|-----------------|----------------------------|-------------------|
| Change PIN code | **04*OLDPIN*NEWPIN*NEWPIN# | OK |
| Unlock PIN code | **05*PUK*NEWPIN*NEWPIN# | No test condition |

19.3 Call waiting

| description | Command | PIML reponses |
|---------------------------------|---------|--------------------------------------|
| Active call waiting | *43# | OK |
| Deactivate call waiting | #43# | OK |
| Interrogate call waiting status | *#43# | +CCWA: 1,1 OK +CCWA: 0,7 OK |

19.4 Call barring

| Description | Command | PIML response |
|--|----------------|--|
| Active call barring of outgoing call | *33*Password# | OK |
| Interrogate call barring of outgoing call. | *#33* | +CLCK: 1,7 +CLCK: 1,7 +CLCK: 1,1 +CLCK: 1,2 |
| Deactivate call barring of outgoing call . | #33*Password# | OK |
| Active call barring of outgoing international call | *331*Password# | OK |
| Interrogate call barring of outgoing international call. | *#331* | +CLCK: 1,7 +CLCK: 1,7 +CLCK: 1,1 +CLCK: 1,2 |
| Deactivate call barring of outgoing international call . | #331*Password# | OK |
| Active call barring of outgoing international | *332*Password# | OK |

| | | |
|--|--------------------------------|--|
| calls except to HPLMN | | |
| Interrogate call barring of outgoing international calls except to HPLMN | *#332* | +CLCK: 1, 7 +CLCK: 1, 7 +CLCK: 1, 1 +CLCK: 1, 2 |
| Deactivate call barring of outgoing international calls except to HPLMN | #332*Password# | OK |
| Active call barring of incoming calls | *35*Password# | OK |
| Interrogate call barring of incoming calls . | *#35* | +CLCK: 1, 1 +CLCK: 1, 7 +CLCK: 1, 2 +CLCK: 1, 7 |
| Deactivate call barring of incoming calls . | #35*Password# | OK |
| Active call barring of incoming calls if roaming. | *351*Password# | OK |
| Interrogate call barring of incoming calls if roaming.. | *#351* | +CLCK: 1, 1 +CLCK: 1, 7 +CLCK: 1, 2 +CLCK: 1, 7 |
| Deactivate call barring of incoming calls if roaming | #351*Password# | OK |
| Deactivate all call barring service | #330*Password# | OK |
| Deactivate all outgoing call barring service | #333*Password# | OK |
| Deactivate all call barring service | #330*Password# | OK |
| Change password for call barring | **03*330*OLDPWD*NEWPWD*NEWPWD# | OK |
| | **03**OLDPWD*NEWPWD*NEWPWD# | OK |
| | *03*330*OLDPWD*NEWPWD*NEWPWD# | OK |
| | *03**OLDPWD*NEWPWD*NEWPWD# | OK |

19.5 Number presentation

| description | Command | PIML reponses |
|-------------|---------|---------------|
|-------------|---------|---------------|

| | | |
|--|-------|--------------------------------------|
| Interrogate incoming call status | *#30# | +CLIP: 0,7 OK +CLIP: 1,7 OK |
| Interrogate send my mobile phone number status | *#31# | +CLIR: 0 OK +CLIR: 1 OK |
| Get IMEI number. | *#06# | 000000 00 000000 0 |
| | | |

20 Appendixes

20.1 ME error result code : +CME ERROR: <error>

| <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 |
| 21 | Invalid index | +CPBR, +CPBW, ATD>[mem]index, +WMGO |
| 22 | Not found | +CPBF, +CPBP, +CPBN, +CGSN, +WOPN, ATD>[mem]"name" |
| 24 | Text string too long | +CPBW, +CPIN, +CPIN2, +CLCK, +CPWD |
| 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 personalization PIN required (Network lock) | All GSM 07.07 commands (+CME ERROR: 40) |

| <error> | Meaning | Resulting from the following commands |
|---------|---|---------------------------------------|
| 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 |

20.2 Message service failure result code: +CMS ERROR : <er>

<er> is defined as below :

| <er> | Meaning | Resulting from the following commands |
|----------|---|--|
| 1 to 127 | Error cause values from the GSM recommendation 04.11 Annex E2 | +CMGS, +CMSS |
| 301 | SMS service of ME reserved | +CSMS (with +CMS: ERROR 301) |
| 302 | Operation not allowed | All SMS commands (+CMSS, +CMGL, +CPMS,+CSMP... |
| 303 | Operation not supported | All SMS commands |
| 304 | Invalid PDU mode parameter | +CMGS, +CMGW |
| 305 | Invalid text mode parameter | +CMGS, +CMGW, +CMSS |
| 310 | SIM not inserted | All SMS commands |
| 311 | SIM PIN required | All SMS commands |
| 312 | PH-SIM PIN required | All SMS commands |
| 313 | SIM failure | All SMS commands |
| 316 | SIM PUK required | All SMS commands |
| 317 | SIM PIN2 required | All SMS commands |
| 318 | SIM PUK2 required | All SMS commands |
| 321 | Invalid memory index | +CMGR, +CMSS, +CMGD |
| 322 | SIM memory full | +CMGW |
| 330 | SC address unknown | +CSCA?, +CMSS, +CMGS |
| 340 | no +CNMA acknowledgement expected | +CNMA |

20.3 Specific error result codes

| <error> | Meaning | Resulting from the following commands |
|---------|---------|---------------------------------------|
|---------|---------|---------------------------------------|

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| | | |
|-----|---|--|
| 500 | unknown error. | All commands |
| 512 | MM establishment failure (for SMS). | +CMGS, +CMSS (+CMS ERROR: 512) |
| 513 | Lower layer failure (for SMS) | +CMGS, +CMSS (+CMS ERROR: 513) |
| 514 | CP error (for SMS). | +CMGS, +CMSS (+CMS ERROR: 514) |
| 515 | Please wait, init or command processing in progress. | All commands (" +CME ERROR: 515" ERROR: 515") or "+CMS |
| 517 | SIM Toolkit facility not supported. | +STGI |
| 518 | SIM Toolkit indication not received. | +STGI |
| 519 | Reset the product to activate or change a new echo cancellation algo. | +ECHO, +VIP |
| 520 | Automatic abort about get plmn list for an incoming call. | +COPS=? |
| 526 | PIN deactivation forbidden with this SIM card. | +CLCK |
| 527 | Please wait, RR or MM is busy. Retry your selection later. | +COPS |
| 528 | Location update failure. Emergency calls only. | +COPS |
| 529 | PLMN selection failure. Emergency calls only. | +COPS |
| 531 | SMS not sent : the <da> is not in FDN phonebook, and FDN lock is enabled. (for SMS) | +CMGS, +CMSS (+CMS ERROR: 531) |
| 532 | the embedded application is activated so the objects flash are not erased | +WOPEN |
| 533 | Missing or Unknown APN | ATD*99 +GACT +CGDATA |

20.4 Failure Cause from GSM 04.08 recommendation (+CEER)

| Cause value | Diagnostic |
|-------------|---|
| 1 | Unassigned (unallocated) number |
| 3 | No route to destination |
| 6 | Channel unacceptable |
| 8 | Operator determined barring |
| 16 | Normal call clearing |
| 17 | User busy |
| 18 | No user responding |
| 19 | User alerting, no answer |
| 21 | Call rejected |
| 22 | Number changed |
| 26 | Non selected user clearing |
| 27 | Destination out of order |
| 28 | Invalid number format (incomplete number) |
| 29 | Facility rejected |
| 30 | Response to STATUS ENQUIRY |
| 31 | Normal, unspecified |
| 34 | No circuit/channel available |
| 38 | Network out of order |
| 41 | Temporary failure |
| 42 | Switching equipment congestion |

| | |
|-----|--|
| 43 | Access information discarded |
| 44 | Requested circuit/channel not available |
| 47 | Resources unavailable, unspecified |
| 49 | Quality of service unavailable |
| 50 | Requested facility not subscribed |
| 55 | Incoming calls barred with in the CUG |
| 57 | Bearer capability not authorized |
| 58 | Bearer capability not presently available |
| 63 | Service or option not available, unspecified |
| 65 | Bearer service not implemented |
| 68 | ACM equal to or greater than ACMmax |
| 69 | Requested facility not implemented |
| 70 | Only restricted digital information bearer capability is available |
| 79 | Service or option not implemented, unspecified |
| 81 | Invalid transaction identifier value |
| 87 | User not member of CUG |
| 88 | Incompatible destination |
| 91 | Invalid transit network selection |
| 95 | Semantically incorrect message |
| 96 | Invalid mandatory information |
| 97 | Message type non-existent or not implemented |
| 98 | Message type not compatible with protocol state |
| 99 | Information element non-existent or not implemented |
| 100 | Conditional IE error |
| 101 | Message not compatible with protocol state |
| 102 | Recovery on timer expiry |
| 111 | Protocol error, unspecified |
| 127 | Interworking, unspecified |

| Cause value | Diagnostic |
|-------------|--|
| 224 | MS requested detach |
| 225 | PDP unsuccessful activation cause MMI ignore |
| 226 | NWK requested Detach |
| 227 | Unsuccessful attach cause NO SERVICE |
| 228 | Unsuccessful attach cause NO ACCESS |
| 229 | Unsuccessful attach cause GPRS SERVICE REFUSED |
| 230 | PDP deactivation requested by Nwk |
| 231 | PDP deactivation cause LLC link activation failed |
| 232 | PDP deactivation cause NWK reactivation with same TI |
| 233 | PDP deactivation cause GMM abort |
| 234 | PDP deactivation cause LLC or SNDSCP failure |
| 235 | PDP unsuccessful activation cause GMM error |
| 236 | PDP unsuccessful activation cause NWK reject |
| 237 | PDP unsuccessful activation cause NO NSAPI available |
| 238 | PDP unsuccessful activation cause SM refuse |

All other values in the range 0 to 31 shall be treated as cause 31.

All other values in the range 32 to 47 shall be treated as cause 47.

All other values in the range 48 to 63 shall be treated as cause 63.

All other values in the range 64 to 79 shall be treated as cause 79.

All other values in the range 80 to 95 shall be treated as cause 95.

All other values in the range 96 to 111 shall be treated as cause 111.

All other values in the range 112 to 127 shall be treated as cause 127.

20.5 Specific Failure Cause for +CEER

| Cause value | Diagnostic |
|-------------|--|
| 240 | FDN is active and number is not in FDN |
| 241 | Call operation not allowed |
| 252 | Call barring on outgoing calls |
| 253 | Call barring on incoming calls |
| 254 | Call impossible |
| 255 | Lower layer failure |

20.6 GSM 04.11 Annex E-2: Mobile originating SM-transfer

These error causes could appear for SMS commands (+CMGS, +CMSS, +CMGD...)

Cause no 1: "Unassigned (unallocated) number"

This cause indicates that the destination requested by the Mobile Station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

Cause no 8: "Operator determined barring"

This cause indicates that the MS has tried to send a mobile originating short message when the MS's network operator or service provider has forbidden such transactions.

Cause no 10: "Call barred"

This cause indicates that the outgoing call barred service applies to the short message service for the called destination.

Cause no 21: "Short message transfer rejected"

This cause indicates that the equipment sending this cause does not wish to accept this short message, although it could have accepted the short message since the equipment sending this cause is neither busy nor incompatible.

Cause no 27: "Destination out of service"

This cause indicates that the destination indicated by the Mobile Station cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signaling message was unable to be delivered to the remote user; e.g., a physical layer or data link layer failure at the remote user, user equipment off-line, etc.

Cause no 28: "Unidentified subscriber"

This cause indicates that the subscriber is not registered in the PLMN (e.g.. IMSI not known)

Cause no 29: "Facility rejected"

This cause indicates that the facility requested by the Mobile Station is not supported by the PLMN.

Cause no 30: "Unknown subscriber"

This cause indicates that the subscriber is not registered in the HLR (e.g.. IMSI or directory number is not allocated to a subscriber).

Cause no 38: "Network out of order"

This cause indicates that the network is not functioning correctly and that the condition is likely to last a relatively long period of time; e.g., immediately reattempting the short message transfer is not likely to be successful.

Cause no 41: "Temporary failure"

This cause indicates that the network is not functioning correctly and that the condition is not likely to last a long period of time; e.g., the Mobile Station may wish to try another

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short message transfer attempt almost immediately.

Cause no 42: "Congestion"

This cause indicates that the short message service cannot be serviced because of high traffic.

Cause no 47: "Resources unavailable, unspecified"

This cause is used to report a resource unavailable event only when no other cause applies.

Cause no 69: "Requested facility not implemented"

This cause indicates that the network is unable to provide the requested short message service.

Cause no 81: "Invalid short message transfer reference value"

This cause indicates that the equipment sending this cause has received a message with a short message reference which is not currently in use on the MS-network interface.

Cause no 95: "Invalid message, unspecified"

This cause is used to report an invalid message event only when no other cause in the invalid message class applies.

Cause no 96: "Invalid mandatory information"

This cause indicates that the equipment sending this cause has received a message where a mandatory information element is missing and/or has a content error (the two cases are undistinguishable).

Cause no 97: "Message type non-existent or not implemented"

This cause indicates that the equipment sending this cause has received a message with a message type it does not recognize either because this is a message not defined or defined but not implemented by the equipment sending this cause.

Cause no 98: "Message not compatible with short message protocol state"

This cause indicates that the equipment sending this cause has received a message such that the procedures do not indicate that this is a permissible message to receive while in the short message transfer state.

Cause no 99: "Information element non-existent or not implemented"

This cause indicates that the equipment sending this cause has received a message which includes unrecognized information elements because the information element identifier is not defined or it is defined but not implemented by the equipment sending the cause. However, the information element is not required to be present in the message so that the equipment sends the cause to process the message.

Cause no 111: "Protocol error, unspecified"

This cause is used to report a protocol error event only when no other cause applies.

Cause no 127: "Interworking, unspecified"

This cause indicates that there has been interworking with a network which does not provide causes for actions it takes; thus, the precise cause for a message which is being sent cannot be ascertained. All values other than specified should be treated as error Cause No 41