# GPRS AT Commands

## AT Commands
## Reference Guide

MultiTech Systems

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### This Command Set Applies to the Following Products:

MultiModem® GPRS (MTCBA-G)
MultiModem® GPRS-USB (MTCBA-G-U)
MultiModem® GPRS with Ethernet Interface (MTCBA-G-EN)
MMCModem™ GPRS (MTMMC-G)
SocketModem® GPRS (MTSMC-G)
MultiModem® iCell (MTCMR-G)

**PN S000293J, Revision J**

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### Revisions

| Revision Level | Date | Description |
|---|---|---|
| A | 07/15/03 | Initial release. |
| B | 03/08/04 | Added *Values* to each command. Added new commands. |
| C | 09/28/04 | Changed data/fax call to **ATD<nb>;** and voice call to **ATD<nb>**<br>Changed Autobauding is supported (operating from 2400 to **115200**) |
| D | 08/04/05 | Added "Length of Phone Numbers" section to Chapter 3. Changed maximum length of phone numbers to 60 digits. Added <mode> to +CMGF values. Added new command, +CMMS. Removed values 2 and 4 from \N. Increased I/O ports to ten in the index value of +WIOR and +WIOW. Added more text to +WRIM. Removed one note from +CGCONT. Changed the font size from 10 point to 9 point; this brought the manual under 200 pages. |
| E | 01/23/06 | Added ®and ™ to products listed on the cover. |
| F | 05/10/07 | Added the +WMBS, a command that supports quad band builds. Updated the Technical Support contact list. |
| G | 08/24/07 | Updated the +WIND command. |
| H | 01/16/08 | Updated the cover and MMCModem product name. |
| I | 09/25/08 | Updated the +ECHO commands and removed Fax commands. Removed all references to HR (Half Rate). Added four new Phonebook commands: WCOS, WPGW, WPGR, WPGS. Added SMS Command: WMCP. Updated to version 6.57d. |
| J | 01/16/09 | Added the MultiModem iCell to the list of products that use this command set. Removed references to fax commands. |

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# Chapter 1 – Introduction

## Scope of This Document

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

## 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 dialing 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

## Definitions

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

**Terminal Equipment (TE)** is the Man-Machine Interface of a GSM device (modem or handset). A **TE** can be a hanset MMI or the AT Command interface.

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 Multi-Tech product supporting the AT commands interface.

# Chapter 2 – AT Command Features

## Line Settings

A serial link handler is set with the following default values (factory settings):

- Autobaud
- 8 bits data
- 1 stop bit
- no parity
- RTS/CTS flow control

Please use the +IPR, +IFC and +ICF commands to change these settings.

## Command Line

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

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

# Chapter 3 – General Behaviors

## SIM Card Insertion and Removal Procedures

SIM card Insertion and Removal procedures are supported. Software functions rely 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 given immediately due to background initialization. Between the hardware SIM detect pin indicating “present” and the previous 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**.

When the hardware SIM detect pin is not managed, the software cannot know the state of the SIM (SIM inserted or SIM removed) except for the initialization of the modem. In this case, the SIM must be present in the rack before the initialization of the modem can be taken into account.

If the SIM is removed and it had been detected at the time of initialization of the modem, the following message is displayed: +CME ERROR: 13. If the SIM is inserted in the rack and it was not present at the time of the initialization of the modem, the state of the SIM remains unchanged (SIM removed). It will have to initialize the modem again so that it is detected.

## 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 comes just after the PIN is checked. After this response user data is loaded (in background). This means that some data may not be available just after 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, 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 switching from ADN to FDN (or FDN to ADN) and trying to read the relevant phonebook immediately,
- When asking for +CPIN? status immediately after SIM insertion and before the product has determined if the inserted card is a valid SIM Card.

## About the Length of Phone Numbers

Phone numbers can consist of up to 60 digits. The first 20 digits are stored in the SIM in the phonebook file ($EF_{ADN}$, $EF_{FDN}$ or $EF_{LND}$) corresponding to the selected phonebook. The next digits are stored in other extension SIM files ($EF_{EXT1}$ or $EF_{EXT2}$).

**Example:**

| Number of Digits | Nb of Records in $EF_{ADN}$ | Nb of Records in $EF_{EXT1}$ |
|---|---|---|
| 1 to 20 | 1 | 0 |
| 21 to 40 | 1 | 1 |
| 41 to 60 | 1 | 2 |

If there are no more free records in the $EF_{EXT1}$, the behavior is:

- if the user tries to store an entry that exceeds 20 digits: +CME: 20
- if the user tries to dial an number that exceeds 20 digits: +CME: 20

Since the maximum length for the numbers in the ADN, FDN, and LND phonebooks is 60 digits:

- if the user tries to dial a number that exceeds 60 digits: +CME: 3

Before the user can perform a call, the number of free records in the $EF_{EXT1}$ is checked for availability of free space to store this number.

- If there are free records left, the call is setup.
- Otherwise, +CME: 20 error is returned (Memory Full).

See Recommendation 3GPP 11.11 for more details.

# Chapter 4 – General AT Commands

## Manufacturer Identification +CGMI

**Description:** Displays the manufacturer identification.
**Values:** No parameters
**Syntax:** AT+CGMI

| Command | Possible responses |
|---|---|
| AT+CGMI<br><br>Note: Get manufacturer identification | WAVECOM MODEM<br>OK<br>Note: Command valid, Wavecom modem |

## Request Model Identification +CGMM

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

**Values:** No parameters

**Syntax**: AT+CGMM

| Command | Possible responses |
|---|---|
| AT+CGMM<br><br>Note: Get hardware version | MULTIBAND 900E 1800<br>OK<br>Note: Multiband: GSM 900 MHz extended band and DCS 1800 (default configuration) |
| AT+CGMM<br>Note: Get hardware version | 900E<br>OK<br>Note: 900 Extended |
| AT+CGMM<br>Note: Get hardware version | 1800<br>OK<br>Note: DCS |
| AT+CGMM<br>Note: Get hardware version | 1900<br>OK<br>Note: PCS |
| AT+CGMM<br>Note: Get hardware version | G850<br>OK<br>Note: GSM 850 |
| AT+CGMM<br>Note: Get hardware version | MULTIBAND G850 1900<br>OK<br>Note: Multiband: GSM 850 and PCS |

## Request Revision Identification +CGMR

**Description:** Displays the revised software version.

**Values:** No parameters

**Syntax:** AT+CGMR

| Command | Possible responses |
|---|---|
| AT+CGMR<br><br>Note: Get software version | 657_09gg.Q2406B 2015268 100506 17:01<br>OK<br>Note: Software release 6.57, generated on the 5th of October 2006 |

# Product Serial Number +CGSN

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

**Values:** No parameters

**Syntax:** AT+CGSN

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

# Select TE Character Set +CSCS

**Description:** Informs the modem which character set is used by the DTE. The modem can convert each character of entered or displayed strings. This is used to send, read or write short messages. See also +WPCS for the phonebooks' character sets.

**Values:** **<Character Set>**

- **GSM** GSM default alphabet.
- **PCCP437** PC character set code page 437.
- **CUSTOM** User defined character set (cf. +WCCS command).
- **HEX** Hexadecimal mode. No character set used; the user can read or write hexadecimal values.

**Default:** GSM alphabet

**Syntax:** AT+CSCS=<Character Set>

| Command | Possible responses |
|---|---|
| AT+CSCS="GSM"<br>Note: GSM default alphabet | OK<br>Note: Command valid |
| AT+CSCS="PCCP437"<br>Note: PC character set code | OK<br>Note: Command valid |
| AT+CSCS=?<br><br>Note: Get possible values | +CSCS: ("GSM","PCCP437","CUSTOM","HEX")<br>OK<br>Note: Possible values |

# Phonebook Character Set +WPCS

**Description:** Informs the modem which character set is used by the DTE for the phonebooks. The modem 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.

**Values:** **<Character Set>**

- **TRANSPARENT** Transparent mode. The strings are displayed and entered as they are stored in SIM or in ME.
- **CUSTOM** User defined character set (cf. +WCCS command).
- **HEX** Hexadecimal mode. No character set used; the user can read or write hexadecimal values.

**Syntax:** AT+WPCS=<Character Set>

| Command | Possible responses |
|---|---|
| AT+WPCS="TRANSPARENT"<br>Note: Transparent mode | OK<br>Note: Command valid |
| AT+WPCS="CUSTOM"<br>Note: Custom character set | OK<br>Note: Command valid |
| AT+WPCS=?<br><br>Note: Get possible values | +WPCS: ("TRANSPARENT","HEX","CUSTOM")<br>OK<br>Note: Possible values |

# Request IMSI +CIMI

**Description:** Reads and identifies the IMSI (International Mobile Subscriber Identity) of the SIM card. The PIN may need to be entered before reading the IMSI.

**Values:** No parameters

**Syntax:** AT+CIMI

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

# Card Identification +CCID

**Description:** Orders the product to read the EF-CCID file on the SIM card.

**Values:** No parameters

**Syntax:** AT+CCID

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

**Note:** 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.

# Capabilities List +GCAP

**Description:** Displays the complete list of capabilities.

**Values:** No parameters

**Syntax:** AT+GCAP

| Command | Possible responses |
|---|---|
| AT+GCAP<br><br>Note: Get capabilities list | +GCAP: +CGSM +FCLASS<br>OK<br>Note: Supports GSM commands |

# Repeat Last Command A/

**Description:** Repeats the previous command. Only the A/ command itself cannot be repeated.

**Values:** No parameters

**Syntax:** A/

| Command | Possible responses |
|---|---|
| A/<br>Note: Repeat last command | |

# Power Off +CPOF

**Description:** Stops the GSM software stack as well as the hardware layer or modem activity. The AT+CFUN=0 command is equivalent to +CPOF.

**Values:** No parameters

**Syntax:** AT+CPOF[=1]

| Command | Possible responses |
|---|---|
| AT+CPOF<br>Note: Stop GSM stack | OK<br>Note: Command valid |
| AT+CPOF=1<br>Note: Stop the modem | OK<br>Note: Command valid |

**Note:** After AT+CPOF[=1], the modem will not respond to AT commands. To reset it, use the hard reset.

**Note:** I n autobaud mode, after an AT+CPOF, unsolicited information that wakes up the modem is sent at 9600 bps until an AT command is sent. When an AT command is sent, the modem will synchronize to the sender's speed.

**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 baud.

# Set Phone Functionality +CFUN

**Description:** Selects the mobile station's level of functionality. When the application wants to stop the product with a power off, or if the application wants to force the product to execute an IMSI DETACH procedure, then it must send: AT+CFUN=0 (equivalent to AT+CPOF).

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

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

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

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.

**Values:** **<functionality level>**

**0** Set minimum funtionality; IMSI detach procedure

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

**Syntax:** AT+CFUN=<functionality level>

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

# Phone Activity Status +CPAS

**Description:** Returns the activity status of the mobile equipment.

**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)

**Syntax:** AT+CPAS

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

# Report Mobile Equipment Errors +CMEE

**Description:** Disables or enables the use of the "+CME ERROR: <xxx>" or "+CMS ERROR:<xxx>" result code instead of simply "ERROR". See the Appendix for *+CME ERROR Result Codes* description and +CMS ERROR result codes.

**Values:** **<error reporting flag>**

- **0** Disable ME error reports; use only << ERROR >>
- **1** Enable <<+CME ERROR: <xxx> >> or
  << +CMS ERROR: <xxx> >>

**Syntax:** AT+CMEE=<error reporting flag>

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

# Keypad Control +CKPD

**Description:** Emulates the modem keypad by sending each keystroke as a character in a <keys> string.

The supported GSM sequences are listed in the Appendix A.

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.

**Values:** **<keys>**

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

**Syntax:** AT+CKPD=<keys>

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

# Clock Management +CCLK

**Description:** Sets or gets the current date and time of the ME real-time clock.

**Values:** **<date and time string>**

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

Note: Valid years are 98 (for 1998) to 97 (for 2097). The second field is not mandatory. Default date/time is "98/01/01,00:00:00" (January 1st, 1998 / midnight).

**Syntax:** AT+CCLK=<date and time string>

| Command | Possible responses |
|---|---|
| AT+CCLK="00/06/09,17:33:00"<br>Note: set date to June 9th, 2000, and time to 5:33pm | OK<br>Note: Date/Time stored |
| AT+CCLK="00/13/13,12:00:00"<br>Note: Incorrect month entered | +CME ERROR 3 |
| AT+CCLK?<br>Note: Get current date and time | +CCLK: "00/06/09,17:34:23"<br>OK<br>Note: current date is June 9th, 2000 current time is 5:34:23 pm |

# Alarm Management +CALA

**Description:** Sets the alarm date/time in the modem. The maximum number of alarms is 16.

**Note:** The date/time should be set with the AT+CCLK command prior to using AT+CALA.

**Values:** **<date and time string>** String format for alarms: "yy/MM/dd,hh:mm:ss" (see +CCLK)

**Note:** Seconds are taken into account.

**<index>** Offset in the alarm list, range 1 to 16

**Syntax:** AT+CALA=<date and time string> (set alarm)

AT+CALA="",<index> (delete alarm)

| Command | Possible responses |
|---|---|
| AT+CALA="00/06/09,07:30"<br>Note: set an alarm for June 9th, 2000 at 7:30 am | OK<br>Note: Alarm stored |
| AT+CALA="99/03/05,13:00:00"<br>Note: set an alarm for March 5th, 1999 at 1:00 pm | +CME ERROR 3<br>Note: Invalid alarm (date/time expired) |
| AT+CALA?<br><br>Note: list all alarms | +CALA: "00/06/08,15:25:00",1<br>+CALA: "00/06/09,07:30:00",2<br>+CALA: "00/06/10,23:59:00",3<br>Note: three alarms are set (index 1, 2, 3) |
| | +CALA: "00/06/08,15:25:00",1<br>Note: an alarm occurs (index 1) |
| AT+CALA="",3<br>Note: delete alarm index 3 | OK<br>Note: Alarm index 3 deleted |
| AT+CALA?<br>Note: list all alarms | +CALA: "00/06/09,07:30:00",2<br>Note: Only one alarm (index 2) |

# Chapter 5 – Call Control Commands

## Dial Command D

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

### Data Calls

For a data 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. **Note:** If a GPRS PPP session is already running, the setting of CSD (GSM data call) is not supported.

### Voice Calls

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.

### Emergency Calls

For **emergency calls:**

These Emergency Numbers are available without a SIM card:

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

These Emergency Numbers are available with a SIM card:

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

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

### International Numbers

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 Multi-Tech offices from another country, the AT command is:

**"ATD+17637853600;"**

Some countries/regions may have specific numbering rules for their GSM handset numbering.

**Values:**

| | |
|---|---|
| **<nb>** | Destination phone number |
| **<I>** | Optional parameter.<br>**<I>** means "invocation" (restrict CLI presentation)<br>**<i>** means "suppresssion" (allow CLI presentation) |
| **<mem>** | Phonebook (one of SM, LD, MC, ON, ME, RC, MT or SN). A default value can be selected by using the +CPBS command. |
| **<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. |

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 Dialing from a Phonebook** (stored in the SIM card) can be performed with the following commands:

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

**ATD> "BILL";** to call "BILL" from the selected phonebook

**ATD> mem <index>** allows direct dialing from a phonebook number
<mem> is **SM**, **LD**, **MC**, **ME**, **RC**, **MT** or **SN**.
See +CPBS command

**Syntax:** ATD<nb>[<I>][;]
ATD>[<mem>]<index>[<I>][;]
ATD>[<mem>]<name>[<I>][;]

| Command | Possible responses |
|---|---|
| AT+CPBS?<br>Note: Which phonebook is selected ? | +CPBS:"SM",8,10<br>Note: ADN phonebook is selected, 8 locations are used and 10 locations are available |
| ATD>SM6;<br>Note: Call index 6 from AND phonebook | OK<br>Note: Call succeeds |

When the **FDN phonebook** has been **locked**, only numbers beginning with the digits of FDN phonebook entries can be called.

For example, if "014629" is entered in the FDN phonebook all the phone numbers beginning with these 6 digits can be called.

The **CLIR supplementary service** subscription can be overridden for **this call only**.

**"I"** means **"invocation"** (restrict CLI presentation).

**"i"** means **"suppression"** (allow CLI presentation).

Control of CUG supplementary service information by **"G"** or **"g"** is allowed for **this call only**. The index and info values set with the +CCUG command are used.

An outgoing call attempt could be refused if the AOC service is active and credit has expired (NO CARRIER).

When trying to set up an outgoing call while there is an active call, the active call is first **put on hold**, then the call set up is carried out.

As per GSM 02.30, GSM sequences may be controlled using dial commands. These sequences can contain **"*", "#"**, but **";"** is forbidden.

If the sequence is not supported or fails, +CME ERROR: <err> is returned. In the case, where the FDN phonebook is activated, the sequences concerning call forwarding are allowed only if they are written in the FDN. See Codes and Values Appendix for the list of supported sequences.

| Command | Possible responses |
|---|---|
| ATD*#21#<br>Note: Check any call forwarding status | +CCFC: 0,7<br>Note: No call forwarding |
| ATD**61*+33146290800**25#<br>Note: Register call forwarding on no reply, with no reply timer fixed at 25 s. | OK<br>Note: done |
| ATD*2#<br>Note: Bad sequence | +CME ERROR 3 |

# Hang-Up Command H

**Description:** The ATH (or ATH0) command disconnects the remote user. In the case of multiple calls, all calls are released (active, on-hold and waiting calls). The specific ATH1 command has been appended to disconnect the current outgoing call, only in dialing or alerting state (i.e., ATH1 can be used only after the ATD command, and before its terminal response (OK, NO CARRIER, ...)
It can be useful in the case of multiple calls.

**Values:** **<n>**

**0** Ask for disconnection (default value)

**1** Ask for outgoing call disconnection

**Syntax:** ATH<n>

| Command | Possible responses |
|---|---|
| ATH<br>Note: Ask for disconnection | OK<br>Note: Every call, if any, is released |
| ATH1<br>Note: Ask for outgoing call disconnection | OK<br>Note: Outgoing call, if any, is released |

# Answer a Call A

**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.

**Values:** No parameters.

**Syntax:** ATA

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

# 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).

# Extended Error Report +CEER

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

**Values:** No parameters

**Syntax:** AT+CEER

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

**Note:** "NO CARRIER" indicates that the AT+CEER information is available for failure diagnosis.

# DTMF Signals +VTD, +VTS

## +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 70 ms ± 5 ms according to 3GPP 23.014).

**Values:** **<n>** tone duration.
This refers to an integer <n> that defines the length of tones emitted as a result of the +VTS command. This does not affect the D command.
A value different than zero causes a tone of duration <n> *100 milliseconds.
A value of zero (default value) causes a tone duration of 70 ms ± 5 ms.
Note: The value is used modulo 256.

**Syntax:** AT+VTD=<n>

| Command | Possible responses |
|---|---|
| AT+VTD=6<br>Note: To define 600 ms tone duration | OK<br>Note: Command valid |
| AT+VTD=0<br>Note: To set the default value (70 ms ± 5 ms) | OK |
| AT+VTD?<br>Note: Query current tone duration | AT+VTD: <n><br>OK |
| AT+VTD=? | AT+VTD: <0-255><br>OK |

### +VTDS

**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.

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

**Syntax:** Command Syntax: AT+VTS=<Tone>

| Command | Possible responses |
|---|---|
| AT+VTS=A | OK<br>Note: Command valid |
| AT+VTS=11<br>Note: To set the default value | +CME ERROR: 3<br>Note: If the <Tone> is wrong |
| AT+VTS=4 | +CME ERROR: 3<br>Note: If there is no communication |
| AT+VTS="1";+VTS="3";+VTS="#"<br>OK<br>Note: Sed tone sequence 13# | |

## Redial Last Telephone Number DL

**Description:** This command redials the last number used in the ATD command. The last number dialed is displayed followed by ";" for voice calls only.

**Values:** No parameters

**Syntax:** ATDL

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

# Automatic Dialing with DTR %D

**Description:** This command enables and disables:

- Automatic dialing of the phone number stored in the first location of the ADN phonebook, (or FDN phonebook, if it is activated using the +CLCK command).
- Automatic sending of the short message (SMS) stored in the first location of the SIM.

The number is dialed when the DTR OFF switches ON.
The short message is sent when DTR OFF switches ON.

**Values:**

**<n> (0-2)** Enables or disables automatic message transmission or number dialing. Informs the product that the number is a voice number rather than a data number.

**%D0** Disables automatic DTR number dialing / message transmission.

**%D1;** Enables automatic DTR dialing if DTR switches from OFF to ON. Dials the phone number in the first location of the ADN phonebook (or FDN phonebook, if it is activated using the +CLCK command). **Voice call with semicolon.**

**%D1** Activates automatic DTR dialing if DTR switches from OFF to ON. Dials the phone number in the first location of the ADN phonebook (or FDN phonebook, if it is activated using the +CLCK command). **Data call without semicolon.**

**%D2** Activates automatic DTR message transmission if DTR switches from OFF to ON. Sends the short message in the first location of the SIM.

**Note:** If the first location is empty:

- AT%D1 and AT%D2 commands will receive an OK response.
- The DTR ON event will trigger a CME ERROR: 21 or a CMS ERROR: 321

**Syntax:** Command Syntax: AT%D<n>[;]

| Command | Possible responses |
|---|---|
| AT%D1;<br>Note: Activates DTR number dialing | OK<br>Note: Command has been executed |
| **DTR is OFF**<br>**DTR switches ON**<br>Note: Number in the ADN's first location is dialed automatically<br>**DTR switches OFF**<br>Note: The product goes on-hook | OK |
| AT%D2<br>Note: Activates DTR short message sending | OK<br>Note: Command has been executed |
| **DTR is OFF**<br>**DTR switches ON**<br>Note: The first short message is being sent | +CMSS: x |
| AT%D1; | OK |
| **DTR is OFF**<br>**DTR switches ON**<br>Note: No phone number in the ADN phonebook's first location (or FDN phonebook if it's activated using the +CLCK command) | +CME ERROR: 21 |
| AT%D2; | OK |
| **DTR is OFF**<br>**DTR switches ON**<br>Note: No short message in the first location of the SIM | +CME ERROR: 321 |

# Automatic Answer S0

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

**Values:**

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

**Syntax:** Command Syntax: ATS0=<value>

| Command | Possible responses |
|---|---|
| ATS0=2<br>Note: Automatic answer after 2 rings | OK |
| ATS0?<br><br>Note: Current value | 002<br>OK<br>Note: always 3 characters padded with zeros |
| ATS0=0<br>Note: No automatic answer | OK<br>Note: Command valid |

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

# Incoming Call Bearer +CICB

**Description:** This command sets the type of incoming calls when no incoming bearer is given (see +CSNS).
**Note:** Setting the +CICB command affects the current value of +CSNS.

**Values:** **<mode>**
**0** Data
**2** Speech

**Syntax:** AT+CICB=<mode>

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

# Single Numbering Scheme +CSNS

**Description:** Selects the bearer to be used when an modem single numbering scheme call is set up (see +CICB).
**Note:** Setting the +CSNS command affects the current value of +CICB.

**Values:** **<mode>**
**0** Voice
**4** Data

**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 | Note: Default incoming bearer: voice call |
| AT+CSNS=? | Note: Test command | +CSNS: (0,2,4) | Note: Voice or data default incoming bearer |

# Gain Control +VGR, +VGT

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

**Values:** **<Rgain>** is the reception gain
**<Tgain>** is the transmission gain

**Syntax:** AT+VGR=<Rgain> and AT+VGT=<Tgain>

| Command | Possible responses | |
|---|---|---|
| AT+VGR=25 | OK | Note: Command valid |
| AT+VGT=45 | OK | Note: Command valid |
| AT+VGR?<br>Note: Interrogate value | +VGR: 128<br>OK | Note: Default receive gain |
| AT+VGR=?<br>Note: Test command | +VGR: (0-255)<br>OK | Note: Possible values |
| AT+VGT?<br>Note: Interrogate value | +VGT: 32<br>OK | Note: Default transmit gain |
| AT+VGT=?<br>Note: Test command | +VGT: (0-255)<br>OK | Note: Possible values |

**Note:** For the **AT+VGT?** command with controller 1, the value is the lower value of range; whereas, with controller 2, the value corresponds to the entered value using AT+VGT=xx.

**The application sends the following:**

| AT+VGR=<val> | for receive gain |
|---|---|
| 0 to 15 | +6 db |
| 16 to 31 | +4 db |
| 32 to 47 | +2 db |
| 48 to 63 | +0 db |
| 64 to 79 | -2 db |
| 80 to 95 | -4 db |
| 96 to 111 | -6 db |
| 112 to 127 | -8 db |
| 128 to 143 | -10 db |
| 144 to 159 | -12 db |
| 160 to 175 | -14 db |
| 176 to 191 | -16 db |
| 192 to 207 | -18 db |
| 208 to 223 | -20 db |
| 224 to 255 | -22 db |

| AT+VGT=<val> **Controller 1** | for transmit gain **Controller 1** |
|---|---|
| 0 to 31 | +30 db |
| 32 to 63 | +33 db |
| 64 to 95 | +36 db |
| 96 to 127 | +39 db |
| 128 to 159 | +42 db |
| 160 to 191 | +45 db |
| 192 to 223 | +48 db |
| 224 to 255 | +51 db |

| AT+VGT=<val> **Controller 2** | for transmit gain **Controller 2** |
|---|---|
| 0 | +0 db |
| 1 | +0,5 db |
| 2 | +1 db |
| 3 | +1,5 db |
| … | … |
| 19 | +9,5 db |
| 20 | +10 db |
| 21 | +10.5 db |
| 22 | +11 db |
| 23 | +11.5 db |
| … | |
| 58 | +29 db |
| 59 | +29.5 db |
| 60 | +30 db |
| 61 | +30,5 db |
| 62 | +31 db |
| … | … |
| 101 | +50,5 db |
| 102 to 127 | +51 db |
| 128 to 243 | -6,5 db |
| 244 | -6 db |
| 245 | -5,5 db |
| 246 | -5 db |
| … | … |
| 255 | -0,5 db |

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.

# Microphone Mute Control +CMUT

**Description:** This command mutes the microphone input on the product (for the active microphone set with the +SPEAKER command). This command is only allowed during a call.

**Values:** **<mode>**

- **0** microphone mute off (default value).
- **1** microphone mute on.

**Syntax:** AT+CMUT=<mode>

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

# Speaker & Microphone Selection +SPEAKER

**Description:** This **specific** command selects the speaker and the microphone set.

**Values:** **<ActiveSpkMic>**

- **0** Speaker One, Micro One
- **1** Speaker Two, Micro Two

**Syntax:** AT+SPEAKER=<ActiveSpkMic>

| Command | Possible responses |
|---|---|
| AT+SPEAKER=0<br>Note: Speaker ONE and Micro ONE | OK<br>Note: Command valid |
| AT+SPEAKER? | +SPEAKER: 0<br>OK<br>Note: Speaker ONE and Micro ONE are active |
| AT+SPEAKER=? | +SPEAKER: (0,1)<br>OK |

# Echo Cancellation +ECHO

**Description:** This command enables, disables or configures 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.

**Notes:**

- You can activate/deactivate the echo cancellation during a call without resetting the product if the <AlgoId> parameter is not changed, but have to used the syntax with all parameters: AT+ECHO=1,6,30,8000,256 for instance.
- To use Echo Cancellation 6, the ECHO feature must be activated.
- Note that Echo Cancellation algorithms may not be available on some modems:

| Modem | Algorithm 6 Support | Algorithm 3 Support |
|---|---|---|
| Q24 Plus (AMR) | Yes | No |

**Values:**

**<mode>**

**0** Deactivate Echo
**1** Activate Echo
When mode = 1 is choosen, **AlgoId** is mandatory.

**<status>**

**0** Echo Deactivated
**1** Echo Activated for Mic/Spk One
**2** Echo Activated for Mic/Spk Two
**3** Reset the product
**Note:** <Status> does not indicate the currently selected speaker. If Echo is activated, it indicates the speaker for which Echo parameters are set. Echo can be activated on a non-selected speaker.

**<AlgoId>**

**1** Echo cancellation 1
**6** Echo cancellation 6: AEC algorithm
Note that Echo Cancellation algorithms may not be available on some modems. Refer to the description above.

- **Echo Cancellation 1 (*4 parameters*):**
  - **<Volout>** Specifies the maximum attenuation of the switch
    **0** 31 db (default)
    **1** 29 db
    **2** 27 db
    **3** 25 db
    …
    **14** 3 db
    **15** 1 db
  - **<Step>** Specifies the attenuation step between attenuation and no attenuation.
    **0** 1 db
    **1** 2 db
    **2** 3 db
    **3** 4 db (default)
  - **<PcmThRel>** Specifies the relative threshold between max and min energy information. The allowed range is [0 - 31]. Default = 10.
  - **<PcmThMax>** Specifies threshold of max energy information. The allowed range is [0 - 31]. Default = 7.

- **Echo Cancellation 6 (*12 parameters*):**
  - **<AlgoParam>** High value leads to high echo attenuation but the full-duplex quality will be less efficient.
    The allowed range is [ 0 - 63 ]. (**30** by default)
  - **<NoiseThres>** indicates the noise threshold. Low value leads to high noise attenuation. The threshold 32767 indicates no noise attenuation. The allowed range is [0 - 32767]. The default is **50**. The values above 512 have no effect (noise reduction will be disabled)
  - **<NmbTaps>** indicates the Number of Taps of the Adaptive Filter. The allowed range is [2 - 256].
    The default is **256**.
    64 taps = short Echo
    256 taps = long Echo

- **<ConvergenceTime1> Convergence time in quiet condition:**
  This parameter expresses duration as the number of GSM speech frames (20 ms each) containing far end speech, upon which the switch only mechanism must run in quiet conditions. The allowed range is [162 - 32767].
  The default is **200**.
- **<ConvergenceTime2> Convergence time in noise condition:**
  This parameter is the same as ConvergenceTime1 but for the *noise* condition. The allowed range is [162 - 32767].
  The default is **550**.

  ***Important Note: <ConvergenceTime2> must be greater than or equal to <ConvergenceTime1>***
- **<NoiseLevelMAX> Upper bound of the noise floor estimate:**
  This parameter is expressed as an integer of 16 bits and corresponds to the rounded value of the noise floor estimate expressed in dB (log2). The allowed range is [NOISE_LEVEL_MIN+1 - 31] with NOISE_LEVEL_MIN being a constant (NOISE_LEVEL_MIN=4 in the current implementation).
  The default is **15**.
- **<DetectionThreshold> Far-end speech detection threshold:**
  In order to detect far end speech on the loudspeaker's signal, the SNR is computed regarding the far end signal power and the far end signal noise floor level. This parameter specifies a threshold on the SNR above which the switch mechanism will be activated. This parameter is expressed as an integer of 16 bits and must be in the range [0 - 32767].
  The default is **32767**.
- **<CNGAdjust> Comfort noise volume gain:**
  Although the comfort noise volume will self adjust to the estimated ambient noise level, it is possible to artificially reduce its level. This parameter is expressed in fixed point as a signed Q15, meaning that 32767 stands for 1.0, and 0 for 0.0. It ranges fro 0 to 32767. Setting this value to 0 means no comfort noise.
  The default is **32767**.
- **<CNGParam1>, <CNGParam2>: 16 bits comfort noise AR2 coefficients:**
  The user will set the AR2 coefficients for a specific car. Their value will be estimated on a recorded noise sequence by means of a tool provided by Wavecom (C or Matlab source code) The recorded sequence shall be made in the noisy conditions and contain noise only.
  The allowed range is [0 - 65535].
  The default for **CNGParam1** is **27484**.
  The default for **CNGParam2** is **38697**.
- **<CNGGain>: 16 bits comfort noise AR2 gain coefficients:**
  This specifies the gain of the AR2 filter used for comfort noise generation. It will be estimated by the same tools use to estimate **<CNGParam1>** and **<CNGParam2>.**
  It is represented as a Q15 of 16 bits. The allowed range is [0 - 32767].
  The default is **7311**.
- **<SOMValue>: Switch attenuation value at the beginning of the call:**
  This parameter will range from 1 to 16 and set the depth of the attenuation of the transmit audio signal when speech is detected on the distant side.
  The default is **4**.
- **<NoiseEstimate>: Value of the noise floor estimate written by the DSP (only in case of active communication):**
  The allowed range is [0 - 32] when a communication is active. Otherwise, the returned value is 65535.

  **Notes:**
  - The field **<NoiseEstimate>** is present only for Algold 6 and only in the response to AT+ECHO?
  - When a new algoid is selected, AT+ECHO? returns 3 for the mode. The changes will be taken into account after a reset.

**Syntax:** **Command Syntax:**

For AlgoId=1:
AT+ECHO=<mode>[,<AlgoId>[,<VolOut>,<Step>,<PcmThRel>,<PcmThMax>]]

For AlgoId=6:
AT+ECHO=<mode>[,<AlgoId>[,<AlgoParam>,<NoiseThres>,<NmbTaps>,<ConvergenceTime1>,<ConvergenceTime2>,<NoiseLevelMAX>,<DetectionThreshold>,<CNGAdjust>,<CNGParam1>,<CNGParam2>,<CNGGain>,<NmbDelay>]]

**Response Syntax:**

For AlgoId=1:
ECHO: <status>,<AlgoId>,<VolOut>,<Step>,<PcmThRel>,<PcmThMax>

For AlgoId=6:
ECHO: <status>,<AlgoId>,<AlgoParam>,<NoiseThres>,<NmbTaps>,<ConvergenceTime1>,<ConvergenceTime2>,<NoiseLevelMAX>,<DetectionThreshold>,<CNGAdjust>,<CNGParam1>,<CNGParam2>,<CNGGain>,<NmbDelay>,<NoiseEstimate>

| Command | Possible responses |
|---|---|
| AT+CMEE=1<br>Note: Enables the use of result code | OK |
| AT+SPEAKER? | + SPEAKER: 0<br>OK<br>Note: Speaker ONE and Micro ONE are active |
| AT+SIDET=0<br>Note: Deactivate the Sidetone | OK |
| AT+SIDET? | +SIDET: 0,0 |
| AT+ECHO?<br>Note: Read current settings | +ECHO: 0,1,0,6,10,7<br>OK |
| AT+ECHO=1,1,0,6,10,7<br>Note: Active Echo cancellation 1 for Mic/Spk one. | OK |
| AT+ECHO?<br>Note: Read current settings | +ECHO: 1,1,0,3,10,7<br>OK |
| AT+ECHO=1,6,30,8000,256<br>Note: Activate the Echo cancellation 6 | +CME ERROR: 519<br>Note: The new algorithm will be activated after a reset of the product |
| AT+ECHO?<br>Note: Read the Echo cancellation settings | +ECHO: 6,30,8000,256<br>OK |
| AT+CFUN=1<br>Note: Reset the product | OK |
| AT+ECHO?<br>Note: Read current settings | +ECHO: 1,6,30,8000,256<br>OK |
| AT+ECHO=0<br>Note: Deactivate the Echo Cancellation | OK |
| AT+ECHO=0<br>Note: Deactivate the Echo Cancellation | OK |
| AT+ECHO=1,6,30,50,256,200,<br>550,15,32767,27484,38697,7311,2<br>Note: Activate the Echo Cancellation 6 | +CME ERROR:519<br>Note: The new algorithm will be activated after a reset of the product |
| AT+ECHO?<br>Note: Read the Echo Cancellation settings | +ECHO: 6,30,50,256,200,550,15,32767,32767,<br>27484,38697,7311,2,65535<br>OK |
| AT+CFUN=1<br>Note: Reset the product | OK |
| AT+ECHO?<br>Note: Read the Echo Cancellation settings | +ECHO: 1,6,30,50,256,200,550,15,32767,32767,<br>27484,38697,7311,2,65535<br>OK |

# SideTone Modification +SIDET

**Description:** This command sets the level of audio feedback in the speaker (microphone feedback in the speaker).

**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

**Syntax:** AT+SIDET=<val1>,<val2>

| Command | Possible responses |
|---|---|
| AT+SIDET=1,0 | OK<br>Note: Command valid |
| AT+SIDET?<br>Note: Current value | +SIDET: 1,0<br>OK<br>Note: Command valid |
| AT+SIDET=? | +SIDET: (0-1),(0-3)<br>OK |

# Initialize Voice Parameters +VIP

**Description:** This command allows factory settings for voice parameters to be restored from EEPROM. These voice parameters include:

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

**Values:** **<n>**

**1** Restore all voice parameters.

Other values are not supported.

**Syntax:** AT+VIP=<n>

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

# Chapter 6 – Network Service Commands

## Signal Quality +CSQ

**Description:** This command determines the *received signal strength indication* (<rssi>) and the *channel bit error rate* (<ber>) with or without a SIM card inserted.

**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 |

**Syntax:** AT+CSQ

| Command | Possible responses |
|---|---|
| AT+CSQ | +CSQ: <rssi>,<ber><br>OK<br>(Note: <rssi> and <ber> as defined below) |

## Operator Selection +COPS

**Description:** There are three possible ways of selecting a Public Land Mobile Network (PLMN) operator:

- The product is in **manual** mode. It then tries to find the operator specified by the application and if found, tries to register.
- The product is in **automatic** mode. It then tries to find the home operator and if found, tries to register. If not found, the product automatically searches for another network.
- The product enters into **manual/automatic** mode, and then tries to find an operator as specified by the application (as in manual mode). If this attempt fails, it enters **automatic** mode. If this is successful, the operator specified by the application is selected. The mobile equipment then enters into **automatic** mode.

**Note:** The read command returns the current mode and 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 communication.

**Values:**

**<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>: format of <oper> field

| | |
|---|---|
| **0** | long alphanumeric format <oper> |
| **1** | short alphanumeric format <oper> |
| **2** | numeric <oper> (default value) |

**<stat>** Status of operator

| | |
|---|---|
| **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 Codes and Values Appendix for operator names description, field is "Name"). The short alphanumeric format can be up to 8 characters long.

**Syntax:** To force an attempt to select and register on a network, the application must send this command:
**Command Syntax:** AT+COPS=<mode>, [<format> [ , <oper> ] ]

**Possible Responses for AT+COPS=<mode>**

| Possible Responses | Meaning |
|---|---|
| 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 communication |
| +CME ERROR: 4 | Incorrect parameters |
| +CME ERROR: 527 | Please wait, and retry your selection later |
| +CME ERROR: 528 | Location update failure – emergency calls only |
| +CME ERROR: 529 | Selection failure – emergency calls only |
| +CME ERROR: 546 | Emergency call is not allowed without SIM |
| +CME ERROR: 547 | Emergency call is allowed without SIM |

**Note:** The error codes **+CME ERROR: 546** and **+CME ERROR: 547** are only returned if the SIM is not present. The fact that network support emergency call (**+CME ERROR: 547)** does not imply that emergency call without the SIM is working. To find out if it is working is to use the ATD112 command.

**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]

**Notes:**

- If an incoming call occurs during a PLMN list request, the operation is aborted (+CME ERROR: 520) and the unsolicited RING appears.
- If SPN (Service Provider Name) is present in the SIM, it will be returned in both long and short alphanumeric <oper> fields. The string in the "short" field will be the SPN truncated to the appropriate character number.

The following operations are allowed with the SIM inserted or the PIN activated:

AT+COPS? Get Current PLMN
AT+COPS=? List allowed PLMN
AT+COPS=1,2,<plmn> Manually set current PLMN

| Command | Possible responses |
|---|---|
| AT+COPS?<br>Note: Ask for current PLMN | +COPS: 0,2,20801<br>OK<br>Note: Home PLMN is France Telecom Orange |
| AT+COPS=?<br><br><br>Note: Ask for PLMN list | +COPS: (2,"F SFR","SFR","20801"), (3,"F-BOUYGUES TELECOM","BYTEL","20820"),(3,"Orange F","Orange","20801"<br>OK<br>Note: Home PLMN is France Telecom SFR, BYTEL and Orange networks have been detected |
| AT+COPS=1,2,20810<br>Note: Ask for registration on SFR network | +CME ERROR: 32<br>Note: Network not allowed – emergency calls only |
| AT+COPS=1,2,23433<br>Note: Ask for registration on UK Orange network | +CME ERROR: 529<br>Note: Selection failed – emergency calls only |
| AT+COPS=0<br>Note: Ask for registration in automatic mode | OK<br>Note: Succeeded |
| AT+COPS=3,0<br>Note: Set <format> to long alphanumeric | OK |
| AT+COPS?<br><br>Note: Ask for current PLMN | +COPS: 0,0,"Orange F"<br>OK<br>Note: Home PLMN is France Telecom Orange |
| AT+COPS=2<br>Note: Ask for deregistration from network | OK<br>Note: Succeeded |
| AT+COPS?<br>Note: Ask for current PLMN | +COPS: 2<br>Note: ME is unregistered until <mode>=0 or 1 is selected |

# Network Registration +CREG

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

**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.

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

# Operator List Management +WOLM

**Description:** This command allows a new or modified operator to be added to the PLMN list. Up to 10 PLMNs can be created and stored in the flash memory.

Please note that if two entries with the same network (MCC+MNC), but have different names, are entered, the first entry will be used.

**Values:** **<mode>**

- **0** Delete
- **1** Write
- **2** Read

**<loc>**

Location. If this parameter is not filled with <mode>=1, the location will be the first emply one.

**<NumOper>**

Operator in numeric format.

**<short name>**

The short name of the PLMN.

**<long name>**

The long name of the PLMN.

**Syntax:**

**Command Syntax:** AT+WOLM=<mode>,<loc>,[,<NumOper>,<short name>,<long name>

**Response Syntax for AT+WOLM=?** OK

**Response Syntax for AT+WOLM?** (lists all the available PLMN)

| Command | Possible responses |
|---|---|
| AT+WOLM=1,1,20812,"WM","WM PLMN"<br>Note: Add a new PLMN at location 1 | OK |
| AT+WOLM=2,1<br>Note: Read the PLMN at location 1 | +WOLM: 1,20812,"WM","WM PLMN"<br>OK |
| AT+WOLM=2,11<br>Note: Read the PLMN at location 11 | +CME ERROR: 21<br>Note: Invalid index |
| AT+WOLM=1,1,20812,"WM1","WM1 PLMN"<br>Note: Modify and existing PLMN | OK<br>Done |
| AT+WOLM=?<br>Note: Test command | OK |
| AT+WOLM?<br>Note: Display current list | +WOLM: 1,20812,"WM1","WM1 PLMN"<br>OK<br>Note: List the created PLMN in flash |
| AT+WOLM=1,,20813,"PLMN2",PLMN2 LONG"<br>Note: Add a new PLMN at available location | OK<br>Or<br>+CME ERROR: 20<br>Note: Error returns if no more PLMN can be created |
| AT+WOLM=0,1<br>Note: Delete an entry at location 1 | OK |
| AT+WOLM=0,11<br>Note: Delete an entry at location 11 | +CME ERROR: 21<br>Note: Invalid index |

# Read Operator Name +WOPN

**Description:** This command returns the operator name in alphanumeric format when given the numeric format being given.

With the E-ONS (Enhanced Operator Name Service) feature, <lac> is an optional parameter to read names from OPL/PNN sim files. If it is not entered, name will be given with current <lac>. Note that in limited service, current <lac> is set to 0.

It also allows the erasing of NITZ PLMN names stored in the flash memory by using AT+WOPN=3,0".

When the modem receives a NITZ (Network Information and Time Zone) message with Long Name or Short Name information, an entry with registered PLMN and names in the message is created in the flash memory. These names will then be used with +COPS, +COPN, +WOPN and +CPOL with the priority order defined in 3GPP TS 22.101. The modem supports only network names with the GSM default alphabet coding schemes.

The user can choose which of the following methods will be used for getting PLMN names using the command: AT+WOPN=4,<PlmnOns>.

The priority order is:

**1 E-ONS** First entry if on Home PLMN or matching entry if existing in OPL/PNN SIM files.

**2 CPHS** If on Home PLMN, use SIM file CPHS ONS (0x6F14) for Long Name if present and SIM file CPHS SONS (0x6F18) for Short Name if present; if not present, reuse SIM file CPHS ONS.

**3 SPN** If on Home PLMN, use SIM file SPN (0x6F46) if present.

**4 NITZ** If there is a matching entry in the list of names received so far, use it. Note that in France, for example, all the operators use the NITZ message for the Date and Time feature, but not for PLMN names, so the list is always empty. In France, the NITZ message is sent on a GPRS attachment.

**FLASH** If there is a matching entry in the flash PLMN list (created by +WOLM), use it.

**5 ROM** PLMN names in the ROM defined according to MoU SE.13 and NAPRD Operator Names documents.

**Note:** Once a long name is found following this priority order, it is given as a response to the AT command.

**Values:** **<mode>**

- **0** Use long alphanumeric format
- **1** Use short alphanumeric format
- **2** Reserved for future use
- **3** Erase NITZ PLMN list if <NumOper> = 0
- **4** Access to EEPROM to read or write the method to use for getting PLMN names
  Read access if <NumOper> omitted
  Write access if <NumOper>(=<PlmnOns>) provided.

**<NumOper>** is the operator in numeric format.

**<AlphaOper>** is the operator in long or short alphanumeric format (see Codes and Values for Operator Names in the Appendix).

**<lac>** is the two byte Location Area Code to be used to get the PLMN name. If it is not entered, the current **lac** will be used (0 if limited service). It is provided as an integer value.

**<PlmnOns>** is a bit-field with the following coding:

- **Bit 0** E-ONS
- **Bit 1** CPHS
- **Bit 2** SPN
- **Bit 3** NITZ
- **Bit 4** FLASH

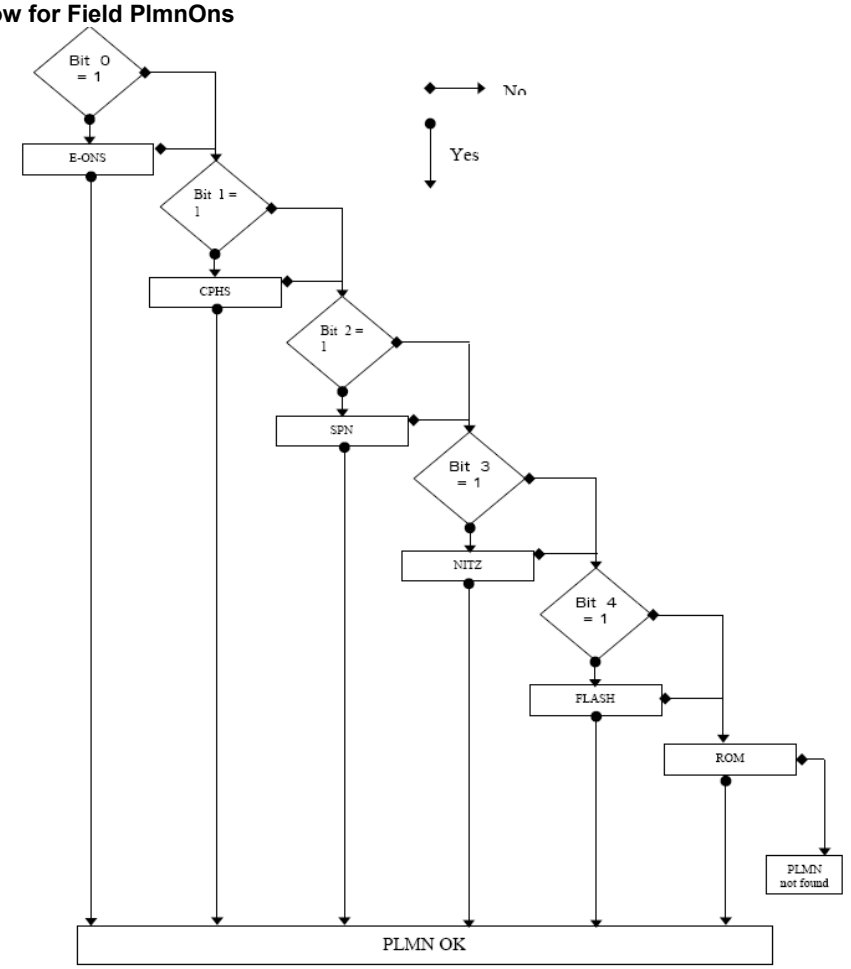
| Bit 4 (FLASH) | Bit 3 (NITZ) | Bit 2 (SPN) | Bit 1 (CPHS) | Bit 0 (E-ONS) |
|---|---|---|---|---|

Bit value is 1 for Activate and 0 for Deactivate the method. <PlmnOns> value should be provided as a decimal value.

| 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|

**Example:** <PlmnOns>=31 means that the four methods will be used for PLMN names (bit-field value is 1111 or 0x1F).

**Operation Flow for Field PlmnOns**



**Syntax:** **Command syntax:** AT+WOPN=<format>,<NumOper>[,<lac>]

**Response syntax:** +WOPN: <format>,<AlphaOper>

| Command | Possible responses |
|---|---|
| AT+WOPN=?<br>Note: Test command | OK |
| AT+WOPN=0,20801<br>Note: Give an operator in numeric format | +WOPN: 0,"Orange F"<br>OK<br>Note: Alphanumeric answer |
| AT+WOPN=0,99999<br>Note: Give a wrong operator | +CME ERROR: 22<br>Note: Not found |
| AT+WOPN=0,2081,36<br>Note: Give an operator in numeric format for lac 36 | +WOPN: 0, "OrangeF"<br>OK<br>Note: Alphanumeric answer |
| AT+WOPN=3,0<br>Note: Erase NITZ PLMN names stored in flash memory. | OK |
| AT+WOPN=4<br>Note: Read from EEPROM which method will be used for PLMN names. | +WOPN:31<br>OK |
| AT+WOPN=4,<PlmnOns><br>Note: Write to EEPROM which method will be used for PLMN names. | OK |

# Selection of Preferred PLMN List +CPLS

**Description:** This command selects one PLMN selector with access technology list in the SIM card that is used by AT+CPOL command.

**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

**Syntax:** AT+CPLS= <List>

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

# Preferred Operator List +CPOL

**Description:** This command edits (or updates) the SIM preferred list of networks.
This list is read in the SIM file selected by the command AT+CPLS.

**Values:** **<index>**: position of the operator record in the Sim preferred operator list. Use **AT+CPOL=?** to view the maximum index of the selected EF.

**<format>**

- **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

**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 access 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 chosen.

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.

(See table on next page)

| Command | Possible responses |
|---|---|
| AT+CPOL?<br><br>Note: Ask for preferred list of networks<br>With only EF_PLMNsel present | +CPOL:1,2,26201<br>+CPOL: 6,2,20810<br>OK<br>Note: Preferred list of networks in numeric format (read in EF_PLMNsel) |
| AT+CPOL?<br><br><br><br>Note: Ask for preferred list of networks<br>With EF_PLMNwAct selected and present | +CPOL:1,2,26201,1,0,0<br>+CPOL: 6,2,20810,1,0,0<br>OK<br>Note: Preferred list of networks in numeric format (read in EF_PLMNwAct)<br>GSM acces technology selected<br>GSM compact acces technology not selected<br>Utran acces technology not selected |
| AT+CPOL=,0<br>Note: Select long alphanumeric format | OK |
| AT+CPOL?<br><br>Note: Ask for preferred list of networks<br>With only EF_PLMNsel present | +CPOL: 1,0,"D1-TELEKOM"<br>+CPOL: 6,0,"F SFR"<br>OK<br>Note: Preferred list of networks in long alphanumeric format |
| AT+CPOL=7,2,20801<br>Note: Add a network to the list | OK |
| AT+CPOL?<br><br>Note: Ask for preferred list of networks<br>With only EF_PLMNsel present | +CPOL: 1,0,"D1-TELEKOM"<br>+CPOL: 6,0,"F SFR"<br>+CPOL: 7,0,"Orange F"<br>OK<br>Note: Preferred list of networks in long alphanumeric format |
| AT+CPOL=7<br>Note: Delete 7th location | OK |
| AT+CPOL?<br><br>Note: Ask for preferred list of networks<br>With only EF_PLMNsel present | +CPOL: 1,0,"D1-TELEKOM"<br>+CPOL: 6,0,"F SFR"<br>OK<br>Note: Preferred list of networks in long alphanumeric format |
| AT+CPOL=8,2,77777<br>Note: Add a new network to the list<br>With only EF_PLMNsel present | OK |
| AT+CPOL=8,2,77777,0,0,1<br>Note: Add a new network to the list<br>With EF_PLMNwact present | OK<br>Note: Acces technology UTRAN is selected |
| AT+CPOL=8,2,77777<br>Note: Add a new network to the list<br>With EF_PLMNwact present | OK<br>Note: Per default Acces technology GSM is selected |
| AT+CPOL?<br><br><br><br>Note: Ask for preferred list of networks<br>With only EF_PLMNsel present | +CPOL: 1,0,"D1-TELEKOM"<br>+CPOL: 6,0,"F SFR"<br>+CPOL: 8,2,77777"<br>OK<br>Note: Preferred networks list in long alphanumeric format; 8th entry is unknown so the product edits it in the numeric format |
| AT+CPOL=9,0,"Orange F"<br>Note: Add a new network to the list (text format) | |
| AT+CPOL?<br><br><br><br>Note: Ask for preferred list of networks<br>With only EF_PLMNsel present | +CPOL: 1,0,"D1-TELEKOM"<br>+CPOL: 6,0,"F SFR"<br>+CPOL: 8,2,77777"<br>+CPOL: 9,0,"Orange F"<br>OK<br>Note: Preferred list of networks in long alphanumeric format |
| AT+CPOL=? | +CPOL: (1-16),(0-2)<br>OK<br>Note: The EF can accept 16 records. Supported formats are 0, 1, or 2. |

# Read Operator Name +COPN

**Description:** This command returns the list of all operator names (in numeric and alphanumeric format) stored in the module.

**Values:** **<NumOper>**: is the operator in numeric format
**<AlphaOper>**: is the operator in long alphanumeric format

**Syntax:** **Command Syntax:** AT+COPN

**Response Syntax:** +COPN: <NumOper>,<AlphaOper>

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

# Chapter 7 – Security Commands

## Enter PIN +CPIN

**Description:** This command enters the ME passwords (CHV1 / CHV2 / PUK1 / PUK2, etc.), that are required before any ME functionality can be used. **CHV1/CHV2** is between **4** and **8** digits long, **PUK1/PUK2** 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.

**Values:** **<pin>** is the Personal Identification Number. A four-digit number.
**<puk>** is the Personal Unblocking Key needed to change the PIN. An eight-digit number.

**Syntax:** AT+CPIN=<pin>

| Command | Possible responses |
|---|---|
| AT+CPIN=1234<br>Note: Enter PIN | OK<br>Note: PIN code is correct |
| AT+CPIN=5678<br>Note: Enter PIN | +CME ERROR: 3<br>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<br>Note: Enter PUK and new PIN | +CME ERROR: 16<br>Note: Incorrect PUK |
| AT+CPIN=12345678,1234<br>Note: Enter PUK and new PIN, 2nd attempt | OK<br>Note: PUK correct, new PIN stored |

To determine 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 personnalisation 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:**
Three failed PIN validations + one successful PUK validation

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

If the user tries to do something which requires PIN2 (CHV2), the product will refuse the action with a "+CME ERROR: 17" (SIM PIN2 required). The product then waits for SIM PIN2 to be given.

Of course, if SIM PIN2 is blocked, SIM PUK2 is required instead of SIM PIN2.

For example, the product needs PIN2 to write in the fixed dialing phonebook (FDN) , so if SIM PIN2 authentication has not been performed during the current session, SIM PIN2 is required

| Command | Possible responses |
|---|---|
| AT+CPBS="FD"<br>Note: Choose FDN | OK |
| AT+CPBW=5,"01290917",129,"Jacky"<br>Note: Write in FDN at location 5 | +CME ERROR: 17<br>Note: SIM PIN2 is required |
| AT+CPIN? | SIM PIN2<br>Note: SIM PIN2 is required |
| AT+CPIN=5678<br>Note: Enter SIM PIN2 | OK |
| AT+CPBW=2,"01290917",129,"Jacky"<br>Note: Write in FDN at location 5 | OK<br>Note: Now writing in FDN is allowed |

Please note that the product only requests PIN2 or PUK2 once. Therefore, if they are not entered properly, the next +CPIN? command will return "+CPIN: READY".

# Enter PIN2 +CPIN2

**Description:** This command validates the PIN2 code (CHV2) or the PUK2 code (UNBLOCK CHV2) and defines a new PIN2 code.

Of course, the +CPIN command allows PIN2 or PUK2 codes to be validated, but only when the **last command executed resulted in PIN2 authentication failure.**

PIN2 length is between 4 and 8 digits; PUK2 length is 8 digits only.

**Values:** **<pin2> is the personal identification number 2**
**<puk2>** is the personal unblocking key 2 needed to change the PIN 2
**<newpin2>**
**Note:** PIN2 length is between 4 and 8 digits; PUK2 length is 8 digits only.

**Syntax:** AT+CPIN2=<pin2>

| Command | Possible responses |
|---|---|
| AT+CPIN2=1234<br>Note: Enter PIN2 | OK<br>Note: PIN2 code is correct |
| AT+CPIN2=5678<br>Note: Enter PIN2 | +CME ERROR: 3<br>Note: Operation not allowed, PIN2 previously entered |

After 3 unsuccessful attempts, PUK2 will be required. PUK2 validation forces the user to enter a new PIN2 code as a second parameter and this will be the new PIN2 code if PUK1 validation succeeds. The application uses this command:

AT+CPIN2=<puk2>,<NewPin2>

| Command | Possible responses |
|---|---|
| AT+CPIN2=00000000,1234<br>Note: Enter PUK2 and new PIN2 | +CME ERROR: 16<br>Note: Incorrect Password (PUK2) |
| AT+CPIN2=12345678,1234<br>Note: Enter PUK2 and new PIN2, 2nd attempt | OK<br>Note: PUK2 correct, new PIN2 stored |

To determine which code must be entered (or not), the following query command can be used:
**AT+CPIN2?**

The possible responses are:

| | |
|---|---|
| +CPIN2: READY | No PIN2 is needed |
| +CPIN2: SIM PIN2 | PIN2 is required |
| +CPIN2: SIM PUK2 | PUK2 is required |
| +CME ERROR: <err> | Absent (10) etc… |

# PIN Remaining Attempt Number +CPINC

**Description:** This command gets the number of valid attempts for PIN1 (CHV1), PIN2 (CHV2), PUK1 (UNBLOCK CHV1) and PUK2 (UNBLOCK CHV2) identifiers.

**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).

**Syntax:** **Command Syntax: AT+CPINC**
**Response syntax: +CPINC: <n1>,<n2>,<k1>,<k2>**

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

# Facility Lock +CLCK

**Description:** This command locks, unlocks or interrogates an ME or network facility <fac>.

**Note:** Test SIM cards (with MCC=001 & MNC=01) do not check “PS”, “PN”, “PU”, “PP” and “PC” locks.

**Values:** **<fac>** supported facilities:

“PS”: SIM lock facility with an 8-digit password.
“SC“: PIN enabled (<mode> = 1) / disabled (<mode> = 0)
“AO”: BAOC (Barr All Outgoing Calls)
“OI”: BOIC (Barr Outgoing International Calls)
“OX”: BOIC-exHC (Barr Outgoing. International Calls except to Home Country)
“AI”: BAIC (Barr All Incoming Calls)
“IR”: BIC-Roam (Barr Inc. When Roaming outside Home Country)
“AB”: All Barring services
“AG”: All outGoing barring services
“AC”: All inComing barring services
“PN”: Network lock with an 8-digit password (NCK).
“PU”: Network Subset lock with an 8-digit password (NSCK).
“PP”: Service Provider lock with an 8-digit password (SPCK).
“PC”: Corporate lock with an 8-digit password (CCK).
“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).

**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 Voice and Data.

If <class> is omitted, the default value 7 will be used.

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.

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

# Change Password +CPWD

**Description:** This command changes 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.

**Values:** **<fac>** supported facilities:

"PS": SIM lock facility with an 8-digit password.
"SC": PIN enabled (<mode> = 1) / disabled (<mode> = 0)
"AO": BAOC (Barr All Outgoing Calls)
"OI" : BOIC (Barr Outgoing International Calls)
"OX": BOIC-exHC (Barr Outgoing. International Calls except to Home Country)
"AI" : BAIC (Barr All Incoming Calls)
"IR" : BIC-Roam (Barr Inc. When Roaming outside Home Country)
"AB": All Barring services
"AG": All outGoing barring services
"AC": All inComing barring services
"P2":
"FD": SIM Fixed Dialing Numbers (FDN) memory feature (PIN2 is required as <password>)
"N"
"U"
"P"
"C"

**<oldpwd>,<newpwd>** 4 or up to 8 or 16 digits according to the facility.

**Syntax:** AT+CPWD= <fac>, <oldpwd>, <newpwd>

| Command | Possible responses |
|---|---|
| AT+CPWD=?<br>Note: Possible values | +CPWD: ("PS",8),("SC",8),("AO",4),("OI",4),("OX",4),<br>("AI",4),("IR,4),("AB",4),("AG",4),("AC",4),<br>("P2",8),("FD",8),("PN",8),("PU",8),("PP",8), ("PC",8)<br>OK<br>Note: CHV1/CHV2 must be on 8 digits maximum (4minimum)<br>For call barring, on 4 digits maximum |
| AT+CPWD="SC",1234,5555<br>Note: Change PIN | OK<br>Note: PIN was correct |
| AT+CPWD="SC",1234,5555<br>Note: Change PIN | +CME ERROR: 16<br>Note: PIN was wrong |
| AT+CPIN=5555<br>Note: Enter PIN | OK<br>Note: PIN was correct |
| AT+CPWD="PN",12345678,00000000<br>Note: Change NCK | OK<br>Note: NCK changed for net lock |

# Chapter 8 – Phonebook Commands

## Introduction to Phonebook Commands

A phonebook group can hold up to 100 entries. These entries can come from different phonebooks (SIM and/or Flash phonebook).

When a SIM is inserted, the phonebook selected by default is set by the command +CPBS.

## About the Parameters

### SIM Contact Structure

| | |
|---|---|
| **<num_Home>** | Home phone number |
| **<Name>** | Name |

### Extended SIM Contact Structure

| | |
|---|---|
| **<num_Home>** | Home phone number |
| **<Name>** | Name |
| **<Phb_Group>** | Phonebook group |

This structure can be used to write and read contacts in mode extended (+WCOS=1) and with ADN phonebook selected (+CPBS="SM").

### Extended Contact Structure

| | |
|---|---|
| **<num_Home>** | Home phone number |
| **<Name>** | Name |
| **<num_Mobile>** | Mobile phone number |
| **<num_Work>** | Work phone number |
| **<num_Data>** | Data phone number |
| **<Email>** | E-Mail address |
| **<Address>** | Postal address |
| **<Phb_Group>** | Phonebook group |

The structure including **<num_Mobile>, <num_Work>, <num_Data>, <Email>,** and **<Address>** will be represented by **<Contact>** in the rest of the document.

### Phonebook Groups Parameter Definition

| | |
|---|---|
| **<index>** | Group index |
| **<name>** | Group name |
| **<phb_entry_index>** | Phonebook entry index |
| **<restrict call>** | Restrict call mode for incoming calls |

# Select Phonebook Memory Storage +CPBS

**Description:** This command selects phonebook memory storage.

**Note on ADN and FDN activation:** When FDN has been activated with the +CLCK command, the selection of ADN phonebook is possible only if ADN staus bit3 is set to 1 (EF file "is readable and can be updated when invalidated"). Please refer to Recommendation 3GPP 11.11 for more details.

**Note:** The previously selected phonebook remains the same when the modem is switched on or reset, even if the new SIM card is inserted. However, in the case when the replacemnet SIM card does not contain any slected phonebook, the ADN phonebook is selected.

**Values:**

**<pb> Phonebook**

| | |
|---|---|
| "SM" | ADN Abbreviated Dialing Numbers (SIM phonebook) |
| "FD" | FDN Fixed Dialing Numbers (SIM restricted phonebook) |
| "ON" | MSISDN (SIM own numbers) |
| "EN" | ECC Emergency Call Codes (SIM or Mobile Equipment) |
| "LD" | LND Last Number Dial |
| "MC" | Mobile Equipment missed (unanswered received) calls list |
| "ME" | Mobile Equipment phonebook |
| "MT" | Combined Moblile Equipment and SIM phonebook (ME + SM) |
| "RC" | Mobile Equipment received calls list |
| "SN" | SDN Services Dialing Numbers (SIM special service numbers) |

**Notes:** "EN" will be available even if ECC SIM file is not present.
When the SIM is not present, the following emergency numbers are available:
**000, 08, 112, 110, 118, 119, 911, 999**
When the SIM is present, the following emergency numbers are available:
**112, 911, emergency number from ECC SIM files (if existing)**

**<pin2> Personal Identification Number 2**
**Notes:** The following emergency numbers are stored in E2P:
**112, 911, 999, 08**
<EN> will be available even if ECC SIM file is not present.

**Maximum Entries:** The maximum number of entries for the Mobile Equipment phonebook is 500.

**Syntax:** AT+CPBS=<pb>[,<pin2>]

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

Selection of the ADN phonebook when FDN is active is SIM dependent.

Selection of the "FD" phonebook with <pin2>, when <pin2> is already verified, will give the error:
CME ERROR:3

# Read Phonebook Entries +CPBR

**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).

If the AT+WCOS =1 command has been used, the response will include <Contact> structure.

**Values:** **<first_entry>,<last_entry>** Location or range of locations of the phonebook entry or entries.

**<type (TON/NP)>** Type of address byte in integer format. Value is 145 if the dialing string (<number> response value) includes the international access code character + ; otherwise, the value is 129.

**Syntax:** **Command Syntx:** AT+CPBR

**Response Syntax:**

- The entry is stored in the ADN phonebook and AT+WCOS=0
  <CR><LF>+CPBR: <loc>,<num>,<type>,<name>
  [<CR><LF>+CPBR: <loc>,<num>,<type>,<name>[...]]
- The entry is stored in the ADN phonebook and AT+WCOS=1
  <CR><LF>+CPBR: <loc>,<num>,<type>,<name>,<Phb_group>
  [<CR><LF>+CPBR: <loc>,<num>,<type>,<name>,<Phb_group>[...]]
- The entry is stored in the Mobile Equipment phonebook and AT+WCOS=0
  <CR><LF>+CPBR: <loc>,<num>,<type>,<name>
  [<CR><LF>+CPBR: <loc>,<num>,<type>,<name>[...]]
- The entry is stored in the Mobile Equipment phonebook and AT+WCOS=1
  <CR><LF>+CPBR: <loc>,<num>,<type>,<name>,<Contact>,<Phb_group>
  [<CR><LF>+CPBR: <loc>,<num>,<type>,<name>,<Contact>, <Phb_group>[...]]

| Command | Possible responses |
|---|---|
| AT+CPBR=?<br>Note: Test command | +CPBR: (1-50),20,10<br>OK<br>Note: 50 locations (from 1 to 50), max length for phone number is 20 digits, 10 characters max for the text |
| AT+WCOS?<br>Note: Test command | +WCOS: 0<br>OK<br>Note: Contact not selected |
| AT+CPBR=12,14<br>Note: Read entries from 12 to 14 | +CPBR: 12,”112”,129,”Emergency”<br>+CPBR: 13,”+331290909”,145,”Fred”<br>+CPBR: 14,”0146290808”,129,”Zazi”<br>OK<br>Note: Display locations 12,13,14 with location, number, type (TON/NPI), Text |
| AT+CPBR=10<br>Note: Read entry 10 | +CPBR:10,”0146290921”,129,”Rob”<br>OK<br>Note: Display location 10 |
| AT+CPBR=11<br>Note: Read entry 11 (UCS2 format) | +CPBR:11,”0146290921”,129,”8000010002FFFF”<br>OK<br>Note: Display location 11 |
| AT+CPBR=52<br>Note: Read entry 52 (wrong) | +CME ERROR: 21<br>Note: Invalid index |
| AT+CPBS=”ME”<br>Note: Flash memory | OK |
| AT+WCOS=1 | OK<br>Note: Contact selected |
| AT+CPBR=13<br>Note: Read entry | +CPBR:13,”+331290909”,145,”Fred”,<br>”0141284549”, 129, “0600003210”, 129, ”0141280000”, 129, “019876543210”, 129,<br>fred@mail_address.com, “Becker Street London”,1<br>OK<br>Note: Display locations 13 with location, number, type (TON/NPI), Text and Contact and Phonebook Group n1 |

**CPBR Command Table Continued**

| Command | Possible responses |
|---|---|
| AT+CPBS=”SM”<br>Note: ADN phonebook | OK |
| AT+CPBR=1 | +CPBR=1,”0123456”,129,”test”<br>OK |
| AT+CPBW=1,”0123456”,,<br>”test”,1<br>Note: Add an external entry in the SIM with group number (1) | OK |
| AT+CPBR=1 | +CPBR=1”0123456”,129,”test”,1<br>OK |

# Write Phonebook Entry +CPBW

**Description:** This command writes a phonebook entry in location number <*index*> in the current phonebook memory storage.

**Notes:**

- "RC" and "MC" phonebooks could be erased only by +CPBW. Adding a field and/or modifying a field is not allowed for these phonebooks.
- This command is not allowed for "EN", "LD", "MC", "RC", "MT", and "SN" phonebooks (they cannot be written).
- If the AT+WCOS=1 command was used, the request would include the "Contact" structure.

**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 octet in integer format).

**Note:** The value is 145 if the dialing string (<number> response value) includes the international access code character +; otherwise, the value is 129 (Example: a <type> value of 17 will be written as 145).

**<text>** String type. Maximum length of <text> field is:

- For the Mobile Equipment phonebook, 30 ASCII characters.
- For the ADN phonebook, SIM dependent (use AT+CPBW=?)

**Notes:**

- For the <text> parameter all strings starting with "80", "81" or "81" are considered in UCS2 format.
- The +CSCS (Select Character Set) command does not affect the format for phonebook entries.

**<contact>** Contact structure.

**<Phb_Group>** Phonebook group number in which the entry should be saved.
The range is 1 to 10. If the entry must not be saved in a group, <Phb_Group> = 0 or can be omitted.

**Syntax:**

**Command Syntax:**

- For ADN phonebook with AT+WCOS=0
  AT+CPBW=<index>[,<number>[,<type>[,<text>]]]
- For ADN phonebook with AT+WCOS=1
  AT+CPBW=<index>[,<number>[,<type>[,<text> [,Phb_group>]]]]
- For the Mobile Equipment phonebook with AT+WCOS=0
  AT+CPBW=<index>[,<number>[,<type>[,<text>]]]
- For the Mobile Equipment phonebook with AT+WCOS=1
  AT+CPBW=<index>[,<number>[,<type>[,<text> [<contact> [,Phb_group>]]]]]

| Command | Possible responses |
|---|---|
| AT+CPBS="SM"<br>Note: ADN phonebook | OK |
| AT+CPBS?<br>Note: Which phonebook is selected | +CPBS:"SM",1,10<br>OK<br>Note: ADN phonebook is selected, 1 location is used and 10 locations are available. |
| AT+WCOS=0<br>Note: phonebook not extended | OK |
| AT+CPBW=?<br>Note: Test command | +CPBW: (1-50),20,(129,145),10<br>OK<br>Note: 50 locations, phone number = 20 digits max, TON/NPI of 129 or 145, text length = 10 |
| AT+CPBW=5,"112",129,"SOS"<br>Note: Write at location 5 | OK<br>Note: Location 5 written |
| AT+CPBR=5<br>Note: Read the entry at location 5 | +CPBR=5,"112",129,"SOS"<br>Note: Location 5 written |
| AT+CPBS?<br>Note: Which phonebook is selected | +CPBS:"SM",2,10<br>OK<br>Note: ADN phonebook is selected, 2 locations are used and 10 locations are available. |

**+CPBW Command Table Continued**

| Command | Possible responses |
|---|---|
| AT+CPBW=5,”01290917”,129,”Jacky”<br>Note: Overwrite location 5 | OK<br>Note: Location 5 overwritten |
| AT+CPBW=6,”01292349”,129,”8000410042”<br>Note: write location 6 (UCS2 format for the <text> field) | OK<br>Note: Location 6 is written |
| AT+CPBW=8,”01292349”,129,”80xyz”<br>Note: write location | OK<br>Note: Location 8 is written. The string has a wrong UCS2 format. It is, therefore, considered as an ASCII string. |
| AT+CPBW=5,”01290917”,129,”Jacky”<br>Note: write an extended entry | +CME ERROR: 3<br>Note: Error because +WCOS: 0 |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBW=5,”01290917”,129,”Jacky”1<br>Note: Write an extended entry | OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBS=”ME”<br>Note: ME Phonebook | OK |
| AT+CPBS?<br>Note: How many entries are used | +CPBS: “ME”,2,500<br>Note: in ME phonebook, 2 locations are used and 500 locations are available. |
| AT+CPBW=1,”0123456798”,129,”first entry”<br>Note: Write a not extended entry | OK |
| AT+CPBW=1,”0123456798”,129,”first entry”,”9876543210”,129<br>Note: Write an extended entry | +CME ERROR: 3<br><br>Note: Error because +WCOS: 0 |
| AT+CPBR=1<br>Note: Read the first entry | +CPBR: 1,”0123456798”,129,”first entry” |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBW=1,”0123456798”,129,”first entry”<br>Note: Write an entry not extended | OK |
| AT+CPBW=2,”9876543210”,129,”second entry”,”6543210987”,129<br>Note: Write an extended entry | OK |
| AT+CPBR=1,2<br>Note: Read entry 1 and 2 | +CPBR: 1,”0123456798”,129,”first entry” |
| AT+CPBW=13,”+331290909”,145,”Fred”, ”0141284549”,129,“0600003210”,129,”0141280000”, 129,“019876543210”,129, fred@mail_address.com, “Becker Street London”,1<br>Note: Write location with Contact and Phonebook Group n1 | OK<br>Note: Location 13 is written |
| AT+CPBW=,”+33145221100”,145,”SOS”<br>Note: Write at the first location available | OK<br>Note: First location available is written |
| AT+CPBW=,”+0345221100”,145,”SOS”<br>Note: Write at the first location available | +CME ERROR: 20<br>Note: Phonebook full |
| AT+CPBW=57,”112”,129,”WM”<br>Note: Write at location 57 (wrong) | +CME ERROR: 21<br>Note: Invalid index |
| AT+CPBW=7,”012345678901234567890”,129,”WAVE”<br>Note: Write at location 7 a phone number exceeding the limit (21 digits) | +CME ERROR: 26<br><br>Note: Phone number too long |
| AT+CPBW=7,”0122334455”,129,”WAVECOMTEL”<br>Note: Write at location 7 along text (11 characters) | +CME ERROR: 24<br>Note: Text too long |
| AT+CPBS=”SM”<br>Note: ADN phonebook | OK |
| AT+WCOS? | +WCOS: 1<br>OK<br>Note: Extended phonebook |
| AT+CPBR=1 | +CPBR:1,”0123456”,129,”test”<br>OK |
| AT+CPBW=1,”0123456,,”test”,1<br>Note: Add an extended entry in SIM with group number 1 | OK |

**+CPBW Command Table Continued**

| Command | Possible responses |
|---|---|
| AT+CPBR=1 | +CPBR:1,"0123456,"129,"test"<br>OK |
| AT+CPBW=1,"0123456,,"test",1<br>Note: Add an extended entry in SIM with group number 1 | OK |
| AT+CPBR=1 | +CPBR:1,"0123456,"129,"test",1<br>OK |
| AT+CPBW=13,"+331290909",145,"Fred",<br>"0141284549",129,"0600003210",129,"0141280000",<br>129, "019876543210",129,<br>fred@mail_address.com, "Becker Street London",1<br>Note: Save the entry in the phonebook group #1 | OK |
| AT+CPBW=13,"+331290909",145,"Fred",<br>"0141284549",129,"0600003210",129,"0141280000",<br>129, "019876543210",129,<br>fred@mail_address.com, "Becker Street London"<br>Note: Save the entry in the phonebook without a group | OK |
| AT+CPBW=13,"+331290909",145,"Fred",<br>"0141284549",129,"0600003210",129,"0141280000",<br>129, "019876543210",129,<br>fred@mail_address.com, "Becker Street London",0<br>Note: Save the entry in the phonebook without a group | OK |

This command is not allowed when the fixed dialing phonebook (FDN) is locked. Moreover, **when the FDN is unlocked**, **PIN2 is required** to write in the FDN phonebook.

But if PIN2 authentication has been performed during the current session, the +CPBW command with FDN is allowed.

| Command | Possible responses |
|---|---|
| AT+CPBS="FD"<br>Note: Choose FDN | OK |
| AT+CPBW=5,"01290917",129,"Jacky"<br>Note: Write in FDN at location 5 | +CME ERROR: 17<br>Note: SIM PIN2 is required |
| AT+CPIN? | +CPIN: SIM PIN2<br>Note: SIM PIN2 is required |
| AT+CPIN=5678<br>Note: Enter SIM PIN2 | OK |
| AT+CPBW=5,"01290917",129,"Jacky"<br>Note: Write in FDN at location 5 | OK<br>Note: Writing in FDN is now allowed |

# Find Phonebook Entries +CPBF

**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" 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.

**Values:**
**<string>** Searched pattern string (depends on the format of the data stored in the phonebooks)
**<loc>** Location number (20 digits maximum)
**<num>** Phone number (20 digits maximum)
**<type>** TON/NPI (Type of address byte in integer format)
**<contact>** Extended contact structure

**Syntax:**
**Command Syntax:** AT+CPBF=<string>
**Response Syntax:**

- The entry is stored in the ADN phonebook and AT+WCOS=0
  <CR><LF> +CPBF=<loc>,<num>,<type>,<name>
- The entry is stored in the ADN phonebook with AT+WCOS=1
  <CR><LF> +CPBF=<loc>,<num>,<type>,<name>,<Phb_group>
- The entry is stored in the Mobile Equipment phonebook with AT+WCOS=0
  <CR><LF> +CPBF=<loc>,<num>,<type>,<name>
- The entry is stored in the Mobile Equipment phonebook with AT+WCOS=1
  <CR><LF> +CPBF=<loc>,<num>,<type>,<name>,<Contact>,<Phb_group>

| Command | Possible responses |
|---|---|
| AT+CPBF=?<br>Note: Test command | +CPBF: 20,10<br>OK<br>Note: Maximum length for a phone number is 20 digits; 14 characters for the text |
| AT+CPBF=“E”<br>Note: Read entries with “E” | +CPBF: 12,”112”,129,”Emergency”<br>+CPBF: 15,”+331290101”,145,”Eric”<br>OK<br>Note: Display locations with text field starting with “E” |
| AT+CPBF=”H”<br>Note: Read entries with “H” | +CME ERROR: 22<br>Note: Entry not found |
| AT+CPBF=”800001”<br>Note: Read entries starting with 0001 UCS2 character | +CPBF: 11, ”0146290921”,129,”8000010002FFFF”<br>OK<br>Note: Display locations with text field starting with 0001 UCS2 character |
| AT+CPBF=”8045C”<br>Note: Read entries with “8045C” (ASCII format) | +CME ERROR: 22<br>Note: Entry not found. The string has a wrong UCS2 format; it is therefore considered as an ASCII string |
| AT+CPBS=”SM”<br>Note: ADN phonebook | OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBF=”Test”<br>Note: Read entries with “Test” | +CPBF: 1,”0123456789”,129,”Test ADN”<br>Note: Display locations with text field starting with “Test” |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBF=”Test”<br>Note: Read entries with “Test” | +CPBF: 1,”0123456789”,129,”Test ADN”,0<br>Note: Display locations with text field starting with “Test”, extended entry. |
| AT+CPBS=”ME”<br>Note: ADN phonebook | OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBF=”Test”<br>Note: Read entries “Test” | +CPBF: 1,”0123456789”,129,”Test ME”<br>Note: Display locations with text field starting with “Test” |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBF=”Test”<br>Note: Read entries with “Test” | +CPBF: 1,”0123456789”,129,”Test ME”,”9876543210”,129,””,””,””,email@mail_address.com, ”post address’,0<br>Note: Display locations with text field starting with “Test”, extended entry. |

# Phonebook Phone Search +CPBP

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

The searched phone number is the FIRST one that the user can enter with AT+CPBW. For example, with this command strin, we can search only the phone number (+331290909):

AT+CPBW=13,"+331290909",145,"Fred","0141284549",129,"0600003210",129,"0141280000", 129, "019876543210",129,fred@mail_address.com, "Becker Street London",0

**Values:**

| | |
|---|---|
| **<PhoneNumber>** | Phone number (coded according to any GSM 07.07 or GSM 07.05 phone number) |
| **<loc>** | Location number |
| **<num>** | Phone number |
| **<type>** | TON/NPI (type of address octet in integer format) |
| **<contact>** | Contact structure |

**Syntax:** **Command Syntax:** AT+CPBP=<PhoneNumber>

**Response Syntax:**

- The entry is stored in the ADN phonebook and AT+WCOS=0
  <CR><LF> +CPBP=<loc>,<num>,<type>,<name>
- The entry is stored in the ADN phonebook with AT+WCOS=1
  <CR><LF> +CPBP=<loc>,<num>,<type>,<name>,<Phb_group>
- The entry is stored in the Mobile Equipment phonebook with AT+WCOS=0
  <CR><LF> +CPBP=<loc>,<num>,<type>,<name>
- The entry is stored in the Mobile Equipment phonebook with AT+WCOS=1
  <CR><LF> +CPBP=<loc>,<num>,<type>,<name>,<Contact>,<Phb_group>

| Command | Possible responses |
|---|---|
| AT+CPBP=?<br>Note: Test command | +CPBP: (1-50),20,10<br>OK Note: 50 locations (from 1 to 50), maximum length for phone number is 20 digits, 10 characters maximum for the text. |
| AT+CPBP="+331290101"<br>Note: Search entries corresponding to this phone number | +CPBP: 15,"+331290101",145,"Eric"<br>OK<br>Note: Display the entry corresponding to the specified phone number |
| AT+CPBP="+331290101"<br>Note: Search entries corresponding to this phone number | +CPBP: 15,"01290101",129,"Eric"<br>OK<br>Note: Display the entry corresponding to the specified phone number |
| AT+CPBP="01290202"<br>Note: Search entries corresponding to this phone number | +CPBP: 15,"+331290202",145,"David"<br>OK<br>Note: Display the entry corresponding to the specified phone number |
| AT+CPBP="+331288575"<br>Note: Search entries corresponding to this phone number | +CPBP: 15,"+331290101",145,"8045682344FFFF"<br>OK<br>Note: Display entry corresponding to the specified phone number (UCS2 format) |
| AT+CPBP="0129"<br>Note: Search entries corresponding to this phone number | +CME ERROR: 22<br>Note: Entry not found |
| AT+CPBS="SM"<br>Note: ADN phonebook | OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBP="0123456789"<br>Note: Search entries correspondeing to this phone number | +CPBP: 1,"0123456789",129,"Test ADN"<br>Note: Display the entry corresponding to the specified phone number |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBP="0123456789"<br>Note: Search entries correspondeing to this phone number | +CPBF: 1,"0123456789",129,"Test ADN",0<br>Note: Display locations with text field starting with "Test", extended entry. |
| AT+CPBS="ME"<br>Note: ADN phonebook | OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBP="0123456789"<br>Note: Search entries correspondeing to this phone number | +CPBP: 1,"0123456789",129,"Test ME"<br>Note: Display locations with text field starting with "Test" |

Continued on next page

**AT+CPBP=<PhoneNumber> continued**

| Command | Possible responses |
|---|---|
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBP="Test"<br>Note: Read entries with "Test" | +CPBF: 1,"0123456789",129,"Test ME","9876543210",129,"","","",email@mail_address.com,"post address',0<br>Note: Display locations with text field starting with "Test", extended entry. |

# Move Action in Phonebook +CPBN

**Description:** This specific command performs a forward or backward move in the phonebook (in alphabetical order). It is not allowed in the "EN" phonebook since it does not contain alphanumeric fields.

**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
- **5** Last item written (usable only if a write operation has been performed on the current phonebook since the end of initialization

**<loc>** Location number

**<num>** Phone number

**<type>** TON/NPI (Type of address octet in integer format)

**<contact>** Contact structure

**Syntax:** **Command Syntax:** AT+CPBN=<mode>

**Response Syntax:**

- The entry is stored in the ADN phonebook and AT+WCOS=0
  <CR><LF> +CPBN=<loc>,<num>,<type>,<name>
- The entry is stored in the ADN phonebook with AT+WCOS=1
  <CR><LF> +CPBN=<loc>,<num>,<type>,<name>,<Phb_group>
- The entry is stored in the Mobile Equipment phonebook with AT+WCOS=0
  <CR><LF> +CPBN=<loc>,<num>,<type>,<name>
- The entry is stored in the Mobile Equipment phonebook with AT+WCOS=1
  <CR><LF> +CPBN=<loc>,<num>,<type>,<name>,<Contact>,<Phb_group>

| Command | Possible responses |
|---|---|
| AT+CPBN=?<br>Note: Test command | +CPBN: (0-5)<br>OK Note: Possible modes |
| AT+CPBS="SM"<br>Note: ADN phonebook | OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBN=0<br>Note: Read the first location | +CPBN: 15,"+331290101",145,"Eric"<br>OK Note: Display the first location |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+CPBN=2<br>Note: Read the next location | +CPBN: 5,"+33147658987",145,"Frank",0<br>OK<br>Note: Display the second location, extended entry |
| AT+CPBN=2<br>Note: Read the next location | +CPBN: 6,"+331290302",145,"Marc",0<br>OK Note: Display the third location, extended entry |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+CPBN=3<br>Note: Read the previous location | +CPBN: 5,"+33147658987",145,"Frank"<br>OK Note: Display the second location |
| AT+CPBN=1<br>Note: Read the last location | +CPBN: 6,"+331290302",145,"Marc"<br>OK Note: Display the last location |
| AT+CPBN=2<br>Note: Read the next location | +CPBP: 15,"+331290101",145,"Eric"<br>OK Note: Display the first location |

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

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

**Note:** The **AT+CPBN=5** command is useful after an AT+CPBW command is used without a location.

# Subscriber Number +CNUM

**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.

**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

**Syntax:** **Command syntax:** AT+CNUM
**Response syntax:** +CNUM: <alpha1>, <number1>, <type1> <CR><LF> +CNUM: <alpha2>, <number2>, <type2> **….**

| Command | Possible responses |
|---|---|
| AT+CNUM<br><br>Note: Get MSISDN(s) | +CNUM:”Phone”, “0612345678”,129<br>+CNUM: “80001002FFFF”, “+0183773”, 145 (UCS2 format)<br>OK<br>Note: MSISDNs |
| AT+CNUM=? | OK |

# Avoid Phonebook Initialization +WAIP

**Description:** This specific command allows the initialization of all phonebooks to be inhibited during subsequent boots.

**Values:** **<mode>**

- **0** Normal initialization (with phonebooks)
- **1** No phonebook initialization

**Syntax:** **Command Syntax:** AT+WAIP=<mode>

| Command | Possible responses |
|---|---|
| AT+WAIP?<br><br>Note: Current values ? | +WAIP:0<br>OK<br>Note: Default value (init phonebooks) |
| AT+WAIP=?<br>Note: Possible values ? | +WAIP: (0,1)<br>OK<br>Note: Disable / enable |
| AT+WAIP =1<br>Note: Inhibit initialization of phonebooks (next boot) | OK<br>Note: no answer |
| AT&W<br>Note: Save modifications in EEPROM | |

**Caution:** The given value should be stored in EEPROM. Therefore, the AT&W command must be used to save the new <mode> value.

**Note:** No phonebook commands are allowed if +WAIP=1 (after boot). If a phonebook command is entered, a "+CME ERROR: 3" is returned.

# Delete Calls Phonebook +WDCP

**Description:** This specific command deletes the calls listed in some phonebooks.

**Values:** **<calls phonebook>**

- **"LD"** SIM (ME extended) Last dialing phonebook
- **"MC"** ME missed calls list phonebook
- **"RC"** ME received calls list phonebook

**Syntax:** **Command Syntax:** +WDCP=<calls phonebook>

| Command | Possible responses |
|---|---|
| AT+WDCP? | OK |
| AT+WDCP=?<br><br>Note: Possible values ? | +WDCP: ("LD","MC","RC")<br>OK<br>Note: Identifiers of the phonebooks supporting a list of calls |
| AT+WDCP="LD"<br>Note: Delete all the content of Last Dialing phonebook. | OK<br>Note: Last Dialing phonebook is now empty. |

# Set Voice Mail Number +CSVM

**Description:** This commands sets/gets and enables/disables the voice mail number in memory.

**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:** The value is 145 if the dialing string includes the international access code character '+'. Otherwise, the value is 129. Example: A <type> value of 17 will be written as 145.

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

| Command | Possible responses |
|---|---|
| AT+CSVM?<br>Note: Get mail number | +CSVM: 1,"660",129<br>OK Note: Voice mail number "660" is activated |
| AT+CSVM=?<br><br>Note: Possible values ? | +CSVM: (0-1),(129,145)<br>OK<br>Note: activation/deactivation and format 129 & 145 are supported |
| AT+CSVM=0,"888",129<br>Note: Disable Voice Mail number and change value to "888". | OK |

# Contact Selector +WCOS

**Description:** This commands enables/disables the displaying of extended contact.

**Values:** **<mode>**

**0** Select the SIM contacts
**1** Select the extended contacts for phonebook entries
**2** Internal use only.
**3**

**Syntax:** **Command Syntax:** AT+WCOS=<mode>

| Command | Possible responses |
|---|---|
| AT+WCOS?<br>Note: Test command | +WCOS: 1<br>OK<br>Note: Extended contact selected |
| AT+WCOS=?<br>Note: List all possible values | +WCOS: (0-2)<br>OK<br>Note: Displays all possible responses |
| AT+WCOS=0<br>Note: Contact not selected | OK |
| AT+WCOS=3 | +CME ERROR: 3<br>Note: Mode not allowed |

# Create and Delete a Phonebook Group +WPGW

**Description:** This commands creates or deletes a phonebook group.

**Values:** **<index>** Index a new group
**<name>** Name of the group. It can be up to 30 ASCII characters or 13 UCS2 characters long

**Syntax:** **Command Syntax:** AT+WPGW=<index>[,<name>]

| Command | Possible responses |
|---|---|
| AT+WPGW=?<br>Note: Test command | +WPGW: (1-10),30<br>OK<br>Note: 10 possible groups, group name can be 30 characters maximum |
| AT+WPGW=1,"group 1"<br>Note: Create group #1 | OK<br>Note: Group 1 created |
| AT+WPGW=1,"phb group 1"<br>Note: Rename group #1 | OK<br>Note: Group 1 created |
| AT+WPGW=1<br>Note: Delete group #1 | OK<br>Note: Group 1 deleted |

# Read a Phonebook Group +WPGR

**Description:** This commands reads the phonebook group entries, the phonebook group name or the number or used records in a group.

**Values:** **<mode>**

- **1** Read the name of one phonebook group
- **2** Read the names of all phonebook groups
- **3** List all entries of one phonebook group
- **4** Read the number of used records in a phonebook group

**<index>**

Index of the group (for use with mode = 3 or mode = 4)

**Syntax:** **Command Syntax:** AT+WPGR=<mode>,<index>

| Command | Possible responses |
|---|---|
| AT+WPGR=?<br>Note: Test command | +WPGR: (1-4),(1-10)<br>OK<br>Note: 10 possible groups |
| AT+WPGR=1,1<br>Note: Read the name of phonebook group 1 | +WPGR: 1,”group 1”<br>OK |
| AT+WPGR=2<br>Note: Read the name of all phonebook groups | +WPGR: 1,”group 1”<br>+WPGR: 2,”group 2”<br>OK |
| AT+WCOS=0<br>Note: Phonebook not extended | OK |
| AT+WPGR=3,1<br>Note: List all entries of phonebook group 1 | +WPGR: 1,”+33123456789”,145,”John”<br>+WPGR: 2,”+33567891234”,145,”Elvis”<br>+WPGR: 31,”+331290909”,145,”Fred”<br>+WPGR: 32,”+0123456789”,129,”Test”<br>OK<br>Note: SIM entries: index 1 and 2; Flash entries; index 31 and 32 (The SIM supports 30 entries in this example) |
| AT+WCOS=1<br>Note: Phonebook extended | OK |
| AT+WPGR=3,1<br>Note: List all extended entries of phonebook group 1 | +WPGR: 1,”+33123456789”,145,”John”, 1<br>+WPGR: 2,”+33567891234”,145,”Elvis”,1<br>+WPGR: 31,”+331290909”,145,”Fred”,”0141284549”, 129,”060003210”,129,”0141280000”,129, ”019876543210”,129,fred@mail_address.com, ”Becker Street London”,1<br>+WPGR: 32,”+0123456789”,129,”Test”,0141284549”, 129,”0600003210”,129,0141280000”,129, ”6549873210”,129,test@mail_address.com,””,1<br>OK<br>Note: SIM entries: index 1 and 2; Flash entries; index 31 and 32 (The SIM supports 30 entries in this example) |

**Note:** The entries list displayed with AT+WPGR=3,1 contains records from both the Mobile Equipment and the SIM phonebooks (MT phonebook).

# Settings of a Phonebook Group +WPGS

**Description:** This commands sets the parameters of a phonebook group.

**Values:**

**<mode>**

**0** Read group settings

**1** Write group settings

**<index>**

Index of the group

**<restrict call>**

Parameter is optional if <mode.=0. It is mandatory if <mode>=1.

**0** All refused. Incoming call is forwarded to the voice mailbox

**1** All accepted. Incoming call is received (RING message is displayed)

**Syntax:** **Command Syntax:** AT+WPGS=<mode>,<index>[,<restrict call>]

| Command | Possible responses |
|---|---|
| AT+WPGS=1,1,1<br>Note: Set restrict call to “All Accepted” | OK |
| AT+WPGS=0,1<br>Note: Read group 1 settings | +WPGS: 1,<br>OK<br>Note: Group1: all accepted |
| AT+WPGS=?<br>Note: Test command | +WPGS: (0-1),(1-10),(0-1)<br>OK |

# Chapter 9 – Short Messages

## Parameters Definition

| | |
|---|---|
| **<da>** | Destination Address, coded according to the GSM Technical Specification 03.40 TP-DA |
| **<dcs>** | Data Coding Scheme, coded according to document [5] |
| **<dt>** | Discharge Time in string format:<br>"yy/MM/dd,hh:mm:ss±zz"(Year [00-99], Month [01-12],<br>Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour] ) |
| **<fo>** | First Byte, coded according to 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) |
| **<mem3>** | Preferred memory to which received SMS are to be stored |
| **<mid>** | CBM Message Identifier |
| **<mr>** | Message Reference |
| **<oa>** | Originator Address |
| **<pid>** | Protocol Identifier |
| **<pdu>** | For **SMS**: GSM 04.11 SC address followed by GSM Technical Specification 03.40 TPDU in hexadecimal format, coded as specified in doc [4] For **CBS**: GSM Technical Specification 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±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone) |
| **<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 locations for messages in <mem1> |
| **<total2>** | Number of locations for messages in <mem2> |
| **<total3>** | Number of locations for messages in <mem3> |
| **<used1>** | Total number of messages in <mem1> |
| **<used2>** | Total number of messages in <mem2> |
| **<used3>** | Total number of messages in <mem3> |
| **<vp>** | Validity Period of the short message, default value is 167 |

# Select Message Service +CSMS

**Description:** The Supported Services include originated (SMS-MO) and terminated short messages (SMS-MT) as well as Cell Broadcast Message (SMS-CB) services.

**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 .

**Syntax:** **Command Syntax:** AT+CSMS=<service>

| Command | Possible responses |
|---|---|
| AT+CSMS=0<br>Note: SMS AT command Phase 2 version 4.7.0 | +CSMS: 1,1,1<br>OK<br>Note: SMS-MO, SMS-MT and SMS-CB supported |
| AT+CSMS=1<br>Note: SMS AT command Phase 2 + | +CSMS: 1,1,1<br>Note: SMS-MO, SMS-MT and SMS-CB supported |
| AT+CSMS?<br>Note: Current values ? | +CSMS: 0,1,1,1<br>OK<br>Note: GSM 03.40 and 03.41 (SMS AT command Phase 2 version 4.7.0 |
| AT+CSMS=?<br>Note: Possible services | +CSMS: (0,1)<br>OK |

# New Message Acknowledgement +CNMA

**Description:** This command allows reception of a new message routed directly to the DTE 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.

Acknowledgement 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 occurs 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).

**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

**Syntax:**

**Command syntax in text mode:** AT+CNMA
**Command syntax in PDU mode:** AT+CNMA [ = <n> [ , <length> [ <CR>

**Note:** PDU is entered using <ackpdu> format instead of <pdu> format (e.g., SMSC address field is not present). *PDU is entered* <ctrl-Z / ESC> ] ] ]

### Example of New Message Acknowledgement in TEXT Mode

| Command | Possible responses |
|---|---|
| AT+CSMS=1<br>Note: SMS AT Commands compatible with GSM 07.05 Phase 2 + version | OK |
| AT+CMGF=1<br>Note: Set TEXT mode | OK<br>Note: TEXT mode valid |
| AT+CNMI=2,2,0,0,0<br>Note: <mt>=2 | OK |
| | +CMT: “123456”,”98/10/01,12:30 00+00”,129,4 ,32,240, “15379”,129,5<CR><LF><br>*Received message*<br>Note: message received |
| AT+CNMA<br>Note: acknowledge the message received | OK<br>Note: send positive acknowledgement to the network |
| AT+CNMA<br>Note: try to acknowledge again | +CMS ERROR: 340<br>Note: no +CNMA acknowledgment expected |

### Example of New Message Acknowledgement in PDU Mode:

| Command | Possible responses |
|---|---|
| AT+CSMS=1<br>Note: SMS AT Commands compatible with GSM 07.05 Phase 2 + version | OK |
| AT+CMGF=0<br>Note: Set PDU mode | OK<br>Note: PDU mode valid |
| AT+CNMI=2,2,0,0,0<br>Note: <mt>=2 | OK |
| | +CMT: ,29<br>07913366003000F1240B913366920547F30000003003419404800<br>B506215D42ECFE7E17319<br>Note: message received |
| AT+CNMA=2,2 <CR><br>>00D3 <Ctrl-Z><br>Note: Negative ACK to the SMS.<br>Reason is: memory capacity exceeded | OK |
| AT+CNMA=2,2 <CR><br>>00D3 <Ctrl-Z><br>Note: Negative ACK to the SMS.<br>Reason is: SIM memory storage is full | OK |
| AT+CNMA=2,2 <CR><br>>00D3 <Ctrl-Z><br>Note: Negative ACK to the SMS.<br>Reason is: Error in modem | OK |
| AT+CNMA=2,2 <CR><br>>00FF <Ctrl-Z><br>Note: Negative ACK to the SMS.<br>Unspecified error | OK |

# Preferred Message Storage +CPMS

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

**Values:**

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

- **SM** SMS message storage in SIM **(default)**
- **ME** SMS message storage in Flash
- **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)**
- **ME** SMS message storage in Flash

**<mem3>**: Memory to which received SMS are preferred to be stored

- **SM** SMS message storage in SIM **(default)**
- **ME** SMS message storage in Flash

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

+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

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

The maximum number of SMS is Flash is 99.

When the modem is switched on, <mem1>,<mem2>, and <mem3> are initialized to SM.

**Syntax:** **Command Syntax:** AT+CPMS=<mem1>,[<mem2>],[<mem3>]

| Command | Possible responses |
|---|---|
| AT+CPMS=?<br><br>Note: Possible message storages | +CPMS: ((“SM”,”ME”,”BM”,”SR”),(“SM”,”ME”),(“SM”,”ME”))<br>OK<br>Note: Read, list, delete: SMS or SMS Status Report<br>Write, send: SMS |
| AT+CPMS?<br><br>Note: Read | +CPMS: “SM”,3, 10,”SM”,3,10,”SM”,3,10<br>OK<br>Note: Read, write…SMS from/to SIM<br>3 SMS are stored in SIM. 10 is the total memory available in SIM |
| AT+CPMS= “SM”,”ME”,“SM”<br>Note: Select SM for reading, ME for writing and SM for storing | +CPMS: 3,10,3,99,3,10<br>OK |
| AT+CPMS=”AM”<br>Note: Select false message storage | +CMS ERROR: 302 |
| AT+CPMS=”BM”<br><br>Note: Select CBM message storage | +CPMS: 2,20,3,10<br>OK<br>Note: Read, list, delete CBM from RAM 2 CBM are stored in RAM |
| AT+CPMS?<br><br>Note: Read | +CPMS: “SM”,3,10,”ME”,3,99,“SM”,3,10,<br>OK<br>Note: Read, store...SMS from/to flash, write SMS to flash. 3SMS are stored in flash. 99 is the total memory available in flash |
| | CMTI: “SM”,4 |
| AT+CPMS= “ME”,”ME”,“ME”<br>Note: Select ME for reading, ME for writing and ME for storing | +CPMS: 3,99,3,99,3,99<br>OK |
| AT+CPMS?<br><br>Note: Read | +CPMS: “ME”,3,99,”ME”,3,99,”ME”,3,99<br>OK<br>Note: Read, write, store SMS from/to flash. 3 SMS are stored in flash. 99 is the total memory available in flash |
| | CMTI: “ME”,4<br>Note: Receive an SMS stored in flash at location 4 |
| AT+CPMS= “AM”<br>Note: Select wrong message storage | +CMS ERROR: 302 |

**Command Syntax:** AT+CPMS=<mem1>,[<mem2>],[<mem3>] **continued**

| Command | Possible responses |
|---|---|
| AT+CPMS= "SM"<br>Note: Selecting SM for reading, writing and storing has not changed | +CPMS: "4,10,4,99,4,99<br>OK |
| AT+CPMS? | +CPMS: "SM",4,10,"ME",4,99,"ME",4,99<br>OK<br>Note: Read SMS from SIM. Write and store SMS from/to flash |

# Preferred Message Format +CMGF

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

**Values:** **<mode> PDU or Text Mode**

**0** PDU mode

**1** Text mode

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 of **bytes** of the TPDU buffer is 14, coded according to GSM Technical Specification 03.40.

In this case, the TPDU is: 0x01 0x03 0x06 0x91 0x21 0x43 0x65 0x00 0x00 0x04 0xC9 0xE9 0x34 0x0B, which is 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; e.g., an byte with hexadecimal value 0x2A is presented to the ME as two characters '2' (ASCII 50) and 'A' (ASCII 65).

**Syntax:** **Command Syntax:** AT+CMGF<mode>

| Command | Possible responses |
|---|---|
| AT+CMGF ?<br><br>Note: Current message format | +CMGF: 1<br>OK<br>Note: Text mode |
| AT+CMGF=?<br><br>Note: Possible message format | +CMGF: (0,1)<br>OK<br>Note: Text or PDU modes are available |

**Example: Sending an SMS Message in PDU mode:**

| Command | Possible responses |
|---|---|
| AT+CMGF=0<br>*Note: Set PDU mode* | OK<br>*Note: PDU mode valid* |
| AT+CMGS=14<CR><br>0001030691214365000004C9E9340B<br>*Note: Send complete MSG in PDU mode, no SC address* | +CMGS: 4<br>OK<br>*Note: MSG correctly sent, <mr> is returned* |

# Save Settings +CSAS

**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.

**Values:** No parameters

**Syntax:** **Command Syntax:** AT+CSAS

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

# Restore Settings +CRES

**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 SIM card.

**Values:** No parameters

**Syntax:** **Command Syntax:** AT+CRES

| Command | Possible responses |
|---|---|
| AT+CRES<br>Note: Restore +CSCA and +CSMP parameters | OK<br>Note: Parameters restored |

# Show Text Mode Parameters +CSDH

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

**Values:** **<n>**: show indicator

- **0** do not show header values
- **1** show the values in result codes

**Syntax:** **Command Syntax:** AT+CSDH

| Command | Possible responses |
|---|---|
| AT+CSDH=0<br>Note: Set value to “do not how” | OK |
| AT+CSDH?<br>Note: Current value | +CSDH: 0<br>OK<br>Note: Do not show header values |

# New Message Indication +CNMI

**Description:** This command selects the procedure for message reception from the network.

**Values:** **<mode>** Controls the processing of unsolicited result codes

**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.

- **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

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

- **0** No SMS-DELIVER indications are routed.
- **1** SMS-DELIVERs are routed using unsolicited code: +CMTI: “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>, <dcs>, <sca>, <tosca>, <length>] <CR><LF><data>
- **3** Class 3 SMS-DELIVERs are routed directly using code in <mt>=2 ; Message of other classes result in indication <mt>=1

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

- **0** No CBM indications are routed to the TE. The CBMs are stored. **Default.**
- **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 DTE using an unsolicited result code.
  If PDU mode:
  +CBM: <length><CR><LF><pdu> (PDU mode)
  If text mode:
  +CBM:<sn>,<mid>,<dcs>,<page>,<pages>(Text mode) <CR><LF> <data>
- **3** Class 3 CBMs: as <bm>=2. Other classes CBMs: as <bm>=1.

**<ds>** Used 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>
  If text mode:
  +CDS: <fo>,<mr>, [<ra>] , [<tora>], <scts>,<dt>,<st>
- **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…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.

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

| Command | Possible responses |
|---|---|
| AT+CNMI=2,1,0,0,0<br>Note: <mt>=1 | OK |
| | AT+CMTI: “SM”,1<br>Note: message received |
| AT+CNMI=2,2,0,0,0<br>Note: <mt>=2 | OK |
| | +CMT: “123456”,”98/10/01,12:30 00+00”,129,4,32,240,<br>“15379”,129,5<CR><LF><br>Note: message received |
| AT+CNMI=2,0,0,1,0<br>Note: <ds>=1 | OK |
| AT+CMGS=”+33146290800”<CR><br>`Happy Birthday!` <ctrl-Z><br>Note: Send a message in text mode | +CMGS: 7<br>OK<br>Note: Successful transmission |
| | +CDS: 2, 116, ”+33146290800”, 145, “98/10/01,12:30:07+04”,<br>“98/10/01<br>12:30:08+04”, 0<br>Note: message was correctly delivered |

# Read Message +CMGR

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

**Syntax:** **Command syntax:** AT+CMGR=<index>

**Response syntax for text mode:**

For **SMS-DELIVER** only

+CMGR: <stat>,<oa>,[<alpha>,] <scts> [,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]
<CR><LF> <data>

For **SMS-SUBMIT** only

+CMGR: <stat>,<da>,[<alpha>,] [,<toda>,<fo>,<pid>,<dcs>, [<vp>], <sca>,
<tosca>,<length>]<CR><LF> <data>

For **SMS-STATUS-REPORT** only)

+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>

**Response syntax for PDU mode:**

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

**Notes:** A message read with status “REC UNREAD” will be updated in memory with the status “REC READ”. The <stat> parameter for the SMS Status Reports is always “READ”.

**Syntax:** **Command Syntax:** AT+CMGR=<index>

| Command | Possible responses |
|---|---|
| | AT+CMTI: “SM”,1<br>Note: New message received |
| AT+CMGR=1<br>Note: Read the message | +CMGR: “REC UNREAD”,”0146290800”,<br>”98/10/01,18:22:11+00”,<CR><LF><br>ABCdefGHI<br>OK |
| AT+CMGR=1<br>Note: Read the message again | +CMGR: “REC UNREAD”,”0146290800”,<br>”98/10/01,18:22:11+00”,<CR><LF><br>ABCdefGHI<br>OK<br>Note: Message is read now |
| AT+CMGR=2 | OK<br>Note: Location empty |
| AT+CMGF=0 ;+CMGR=1<br><br>Note: In PDU mode | +CMGR: 2,,<length> <CR><LF><pdu><br>OK<br>Note: Message is stored but unsent, no <alpha>field |
| AT+CMGF=1;+CPMS=”SR”;+CNMI=,,,2<br>Reset to text mode, set read memory to “SR”, and allow storage of further SMS Status Report into “SR” memory | OK |
| AT+CMSS=3<br>Send an SMS previously stored | +CMSS: 160<br>OK |
| | +CDSI: “SR”,1<br>New SMS Status Report stored in “SR” memory at index 1 |
| AT+CMGR=1<br>Read the SMS Status Report | +CMGR: "REC UNREAD",6,160, "+33612345678",129,<br>"01/05/31,15:15:09+00",<br>"01/05/31,15:15:09+00",0<br>OK |

# List Message +CMGL

**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.

**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 unsent messages |
| "STO SENT" | 3 | stored sent 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.

**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 **SMS-DELIVER**, **SMS-SUBMIT** and **SMS-STATUS-REPORT.** May be followed by other <CR><LF>+CMGL:<index>…)

| Command | Possible responses |
|---|---|
| AT+CMGL="REC UNREAD"<br>Note: List unread messages in text mode | +CMGL: 1,"REC UNREAD","0146290800",<br><CR><LF> `I will be late`<br>+CMGL: 3,"REC UNREAD", "46290800",<br><CR><LF>`See you tonight!`<br>OK<br>Note: 2 messages are unread, these messages will then have their status changed to "REC READ" |
| AT+CMGL="REC READ"<br>Note: List read messages in text mode | +CMGL: 2,"REC READ","0146290800",<CR><LF><br>`Keep cool`<br>OK |
| AT+CMGL="STO SENT"<br>Note: List stored and sent messages in text mode | OK<br>Note: No message found |
| AT+CMGL=1<br>Note: List read messages in PDU mode | +CMGL: 1,1,,26<br><CR><LF><br>07913366003000F3040B913366920547F400130011904125<br>30400741AA8E5A9C5201<br>OK |

# Send Message +CMGS

**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').

**Values:** See the Parameters Definition list at the beginning this chapter.

**Syntax:** **Command syntax in text mode:**

AT+CMGS= <da> [ ,<toda> ] <CR>
*Text is entered:* <ctrl-Z / ESC >

**Command syntax in PDU mode*:***

AT+CMGS= <length> <CR>
*PDU is entered:* **<ctrl-Z / ESC >**

**Command Syntax:** AT+CMGS

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

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

**Note:** This number is not a storage number. Outgoing messages are not stored.

# Write Message to Memory +CMGW

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

**Values:**

**<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

- **0** "REC UNREAD"
- **1** "REC READ"
- **2** "STO UNSENT"
- **3** "STO SENT"

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

**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 Syntax:** +CMGW

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

# Send Message from Storage +CMSS

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

**Values:**
- **<index>** Location of stored message
- **<da>** Desination address
- **<toda>** Type of destination address
- **<mr>** Message reference

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

# Set Text Mode Parameters +CSMP

**Description:** This command selects values for <vp>, <pid>, and <dcs>.

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

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

**Note:** <fo> must be entered in DECIMAL format. Hexadecimal format would lead to irrelevant results

**RP** Reply Path, not used in text mode.

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

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

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

**RD** Reject Duplicates, b2=1 to instruct the SC to reject an SMS-SUBMIT for an SM still held in the SC that has the same <mr> and <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) x 5 minutes (up to 12 hours) |
| 144 to 167 | 12 hours + ( (VP – 143) x 30 minutes ) |
| 168 to 196 | (VP – 166) x 1 day |
| 197 to 255 | (VP – 192) x 1 week |

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

**<dcs>** This 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.

**Syntax:** **Command Syntax:** AT+CSMP=<fo>, <vp>, <pid>,<dcs>

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

# Delete Message +CMGD

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

Refer to the Preferred Message Storage +CPMS command.

**Values:** **<index> If <DelFlag>=0**

- **(1-20)** If the preferred message storage is "BM"
- Sim dependent integer values (in the range of SIM location number) if the preferred message storage is "SM" or "SR".

If **<DelFlag> is > 0**, <index> is ignored.

**<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.

**Notes:** If **<DelFlag>** is omitted, default value is used.

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.

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

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

# Service Center Address +CSCA

**Description:** This command indicates the service center to which 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 initializing the SMS. This address is then permanently valid. The application may change it if necessary.

**Values:** **<sca>** service center address

**Syntax:** **Command Syntax:** AT+CSCA=<sca>

| Command | Possible responses |
|---|---|
| AT+CMGS= "+33146290800"<CR><br>Hello, how are you?<ctrl-Z><br>Note: Send a message | +CMS ERROR: 330<br>Note: service center unknown |
| AT+CSCA="0696741234"<br>Note: Service center initialization | OK |
| AT+CMGS="+33146290800"<CR><br>Happy Birthday ! <ctrl-Z><br>Note: | +CMGS: 1<br>OK<br>Note: Successful transmission |

# Select Cell Broadcast Message Types +CSCB

**Description:** This command selects which types of CBMs are to be received by the ME. This command is allowed in both PDU and text modes.

**Values:** The **<bm>** parameter of +CNMI command controls the message indication.

The activation of **CBM reception (<mode>=0)** can select only specific **Message Indentifiers (list in <mids>)** for specific **Languages (list in <dcss>)**, but the deactivation stops any reception of CBMs (only AT+CSCB=1 is allowed).

**Message Identifiers (<mids> parameter**) indicates the type of message identifiers for which the ME should listen.

**<dcss>** Supported languages

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

**Syntax:** **Command Syntax:** AT+CSCB= <mode>, [ <mids>, [ <dcss> ] ]

**Important Note:** Test/read command AT+CSCB? is not supported.

| Command | Possible responses |
|---|---|
| AT+CSCB=0,"15-17,50,86"," "<br>Note: Accept SMS-CB types, 15,16,17,50 and 86 in any language | OK<br>Note: CBMs can be received |
| | +CBM: 10<CR><LF><br>00112233445566778899<br>Note: CBM length of a received Cell Broadcast message (SMS-CB), CBM bytes in PDU mode |
| AT+CSCB=1<br>Note: Deactivate the reception of CBMs | OK<br>Note: CBM reception is completely stopped |

# Cell Broadcast Message Identifiers +WCBM

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

The EF-CBMI file is not used with the +CSCB command.

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

**Values:** **<mids>** message identifiers

**Syntax:** **Command Syntax:** AT+WCBM= <mids>

| Command | Possible responses |
|---|---|
| AT+WCBM=”10,100,1000,10000”<br>Note : Write 4 messages identifiers in EFCBMI | OK<br>Note : CBMIs are stored in EF-CBMI |
| AT+WCBM?<br>Note : Read the CBMIs in EF-CBMI | +WCBM=”10,100,1000,100000”<br>OK<br>Note : 4 CBMIs are stored in EF-CBMI |

# Message Status Modification +WMSC

**Description:** This command allows the manipulation of a message status. The accepted status changes are from READ to NOT READ and vice versa, and also from SENT to NOT SENT and vice versa.

**Values:** **<loc>** Location number of the stored message <interger>

**<status>** New status to be stored, as in the +CMGL command

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

**Syntax:** **Command Syntax:** AT+WMSC= <loc>, <status>

| Command | Possible responses |
|---|---|
| AT+CMGR=2 | +CMGR: “REC READ”,”+336290918”,,”99/05/01 14:19:44+04” <CR><LF><br>Hello All of you!<br>OK |
| AT+WMSC=2,”REC UNREAD” | |
| AT+CMGR=2 | +CMGR: “REC UNREAD”,”+336290918”,,”99/05/01 14:19:44+04” <CR><LF><br>Hello All of you!<br>OK |

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

# Message Overwriting +WMGO

**Description:** The +CMGW command specifies a location in the SMS or Flash memory for the next SMS to be stored when the +CMGW indicates a message is ready to be stored. The defined location is used only once: +WMGO has to 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.

**Values:** **<loc>** Location number of the SIM record to write or overwrite. The number depends on the SIM or Flash memory capacity.

**Syntax:** **Command Syntx:** AT+WMGO= <loc>

| Command | Possible responses |
|---|---|
| AT+CPMS?<br>Note: Check the storage area | +CPMS: “SM”,3,10,”SM”,3,10,”SM”,3,10 |
| AT+CMGW=”+33146290800”<CR><br>Hello how are you?<ctrl-Z><br>*Note: Write a message in text mode* | +CMGW: 4<br>OK<br>*Note: Message stored in index 4 in the SIM* |
| AT+WMGO=? | +WMGO: (1-10)<br>OK<br>*Note: Possible values for the SIM* |
| AT+WMGO=4 | |
| AT+CMGW=”+33146299704”<CR><br>You are overwritten<ctrl-Z> | +CMGW: 4<br>OK<br>*Note: New Message stored in index 4* |
| AT+WMGO? | +WMGO: 4<br>OK<br>*Note: The value was used, so re-initialization* |
| AT+WMGO=4 | OK |
| AT+CPMS=”SM”,”ME,””SM” | +CPMS: 3,10,0,99,3,10<br>OK<br>*Note: Change the storage area from SIM to Flash* |
| AT+WMGO? | +WMGO: (1-99)<br>OK<br>*Note: Possible values for Flash* |
| AT+WMGO? | +WMGO: 0<br>OK<br>*Note: We changed the storage area, so the value was reinitialized* |
| AT+WMGO=999 | +CMS ERROR: 321 |

**Note:** If the storage area is changed with the AT+CPMS command, the value of WMGO will be reset to zero.

# Change or Do Not Change SMS Status +WUSS

**Description:** The +WUSS command allows the SMS Status to be kept at UNREAD after the +CMGR or +CMGL commands are used.

**Values:** **<mode>**

**0** The SMS Status will change

**1** The SMS Status will not change

**Syntax:** **Command Syntax:** AT+WUSS=<mode>

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

# Copy Messages +WMCP

**Description:** This command copies the SMS from the SIM to the Flash or from the Flash to the SIM.

**Values:** **<mode>**

**0** From SIM to the Flash

**1** From the Flash to the SIM

**<loc>**

Location of the SMS to copy (mandatory for <mode>=1)
If this location is not defined, all the SMS will be copied
Note: The SMS copied will be placed in the first free location

**Syntax:** **Command Syntx:** AT+WMCP=<mode>[,<loc>]

| Command | Possible responses |
|---|---|
| AT+WMCP=? | +WMCP: 0,(1-12)<br>+WMCP: 1,(1-99)<br>OK<br>Note: The location of the SMS that can be copied from the SIM to the Flash is 1 to 12 (maximum available in the SIM). The location of the SMS that can be copied from the Flash to the SIM is 1 to 99 (the maximum available in the Flash). |
| AT+CPMS?<br><br>Note: Read the SMS storage | +CPMS: “SM”,3,10,”ME”,0,99,”SM”,3,10<br>OK<br>Note: Read, write...SMS from/to SIM. 3 SMS are stored in the SIM. 10 is the total memory available in SIM. No SMS in Flash. |
| AT+CMGR=1<br><br>Note: Read the first SMS from the SIM | +CMGR: “REC UNREAD”,”0146290800”, “98/10/01,18:22:11+00”, <CR><LF><br>`My test message: SMS in the SIM at location 1`<br>OK |
| AT+WMCP=0,1<br>Note: Copy the SMS at location 1 in the SIM to the Flash | OK |
| AT+CPMS?<br><br>Note: Read the SMS storage | +CPMS: “SM”,3,10,”ME”,0,99,”SM”,3,10<br>OK<br>Note: Read, write...SMS from/to SIM. 3 SMS are stored in the SIM. 10 is the total memory available in SIM. No SMS in Flash. |
| AT+CPMS=“ME”,”ME”,“ME”<br>Note: Select ME for reading, ME for writing and ME for storing | +CPMS: 1,99,1,99,1,99<br>OK |
| AT+CMGR=1<br><br>Note: Read the first SMS from the Flash | +CMGR: “REC READ”,”0146290800”, “98/10/01,18:22:11+00”, <CR><LF><br>`My test message: SMS in the SIM at location 1`<br>OK |
| AT+CMGW=”+33146290800”<CR><br>`Other test message: SMS in the Flash at location 2`<br><ctrl-Z><br>Note: Write a message in text mode | +CMGW: 2<br>OK<br>Note: Message stored in index 2in the Flash |
| AT+CPMS?<br><br>Note: Read the SMS storage | +CPMS: “ME”,2,99,”ME”,2,99,”ME”,2,99<br>OK<br>Note: Read, write...SMS from/to the Flash. 2 SMS are stored in the Flash. |
| AT+WMCP=1,2<br>Note: Copy the SMS at location 2 in the Flash to the SIM | OK |
| AT+CPMS=“SM”,”ME”,“SM”<br>Note: Select SM for reading, ME for writing and SM for storing | +CPMS: 4,10,2,99,4,10<br>OK |
| AT+CMGR=4<br><br>Note: Read the first SMS from the SIM | +CMGR: “REC UNREAD”,”+33146290800”, “98/10/01,8:22:11+00”,<CR><LF><br>`Other test message: SMS in the Flash at location 2`<br>OK |

Continued on the next page.

**Command Syntx:** AT+WMCP=<mode>[,<loc>] Continued

| Command | Possible responses |
|---|---|
| AT+CPMS=”ME”<br>Note: Select ME for reading | +CPMS: 2,99,2,99,4,10<br>OK |
| AT+CMGD=0,4<br><br>Note: Erase all the SMS stored in the Flash | OK |
| AT+CPMS?<br><br>Note: Read the SMS storage | +CPMS: “ME”,0,99,”ME”,0,99,”SM”,4,10<br>OK<br>Note: No SMS is stored in the Flash |
| AT+WMCP=0<br>Note: Copy all the SMS from the SIM to the Flash | OK |
| AT+CPMS?<br><br>Note: Read the SMS storage | +CPMS: “ME”,4,99,”ME”,4,99,”SM”,4,10<br>OK<br>Note: 4 SMS are stored in the Flash |

# More Messages to Send +CMMS

**Description:** This short message service-oriented AT command allows the link to be kept open while sending several short messages with only a short delay.

**Values:** **<mode>**

**0** Disable feature

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

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

**Notes:**

- **IMPORTANT:** Before sending the **last** SMS in the link, you **must use** the **AT+CMSS=0** command. This command will indicate that the FOLLOWING SMS will be the last one.
- The delay of 5 seconds complies with Rec 3GPP 27.005...3.5.6

**Syntax:** **Command Syntax:** AT+CMMS=<mode>

| Command | Possible responses |
|---|---|
| AT+CMMS=0<br>Note: Disable feature | OK<br>Note: Feature is disabled |
| AT+CMMS=1<br>Note: Enable feature 1 time | OK<br>Note: Feature is enabled; link is open |
| AT+CMMS=2<br>Note: Enable feature | OK<br>Note: Feature is enabled; link is open |
| AT+CMMS? | +CMMS: 2<br>OK |
| AT+CMMS=? | +CMMS: (0-2)<br>OK |

# Chapter 10 – Supplementary Services Commands

## Call Forwarding +CCFC

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

**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 dialing string includes international access code character "+"; otherwise, 129).

**<class>**
- **1** Voice
- **2** Data
- **4** Short Messages
- **5** 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).
In the case where the FDN phonebook is activated, the registration is restricted to the phone numbers written in the FDN.
If <Class> parameter is not given in the command, 7 is used as the default value.

**<subaddr>** not managed

**<satype>** not managed

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

**<status>**
- **0** not active
- **1** active

**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,"0146290800"<br>Note: Register to an unconditional call forwarding | OK<br>Note: Command valid |
| AT+CCFC=0,2<br>Note: Interrogate unconditional call forwarding | +CCFC:1,1,"0146290800",129<br>Note: Call forwarding active for voice<br><CR><LF>+CCFC:1,2,"0146290802",129<br>Note: Call forwarding active for data |
| AT+CCFC=0,4<br>Note: Erase unconditional call forwarding | OK<br>Note: Command valid |

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

# Call Barring +CLCK

**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 for a combination of some.

**Values:**

**<fac>**

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

**<mode>**

- **0** Unlocks the facility
- **1** Locks the facility
- **2** Query status

**<class>**

See description for the +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).

**<status>**

- **0** Not active
- **1** Active

**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="AO",1,1234 | OK<br>Note: Command valid |
| AT+CLCK="AO",0,5555 | +CME ERROR: 16<br>Note: Wrong password |
| AT+CLCK="AO",0,1234 | OK<br>Note: Command valid |

# Modify SS Password +CPWD

**Description:** This command changes the supplementary service password.

**Values:**

**<fac>** See +CLCK command with only "P2" facility added (SIM PIN2).
**Note:** Regardless of the specified facility, the change of password applies to *barring all calls*.

**<OldPassword>, (NewPassword>** The password code is over 8 digits for P2 facility (4 to 8 digits)
The password code is over 4 digits for other facilities (1 to 4 digits)

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

| Command | Possible responses |
|---|---|
| AT+CPWD="AO",1234,5555<br>Note: Change Call Barring password | OK<br>Note: Password changed |
| AT+CPWD="AO",1234,5555<br>Note: Change password | +CME ERROR: 16<br>Note: Wrong password |
| AT+CPWD="AO",5555,1234<br>Note: Change password | OK<br>Note: Password changed |

# Call Waiting +CCWA

**Description:** This command controls the call waiting supplementary service.

The product will send a +CCWA unsolicited result code when the call waiting service is enabled.

**Values:** **<n>**: result code presentation status in the TA

- **0** Disable
- **1** Enable

**<mode>**

- **0** Disable
- **1** Enable
- **2** Query status

**<type>**

- **0** Type of address byte in integer format (refer to Rec GSM 04.08 [8] sub clause 10.5.4.7)

**<class>**

- **1** Voice
- **2** Data
- **8** Short Messages
- **7** All classes (voice, data)

**Note:** 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

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

**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=1,1,1<br>Note: Enable call waiting for voice calls | OK<br>Note: Command valid |
| AT+CCWA=1,2<br>Note: Interrogate call waiting | +CCWA:1,1<br>OK<br>Note: Call waiting active for voice calls |
| | +CCWA:"0146290800",145,1,"FREDDY"<br>Note: Number and name of the waiting voice call<br>or<br>+CCWA:"0146290800",145,1,"8023459678FFFF" (UCS2 format) |
| AT+CCWA=1,0,7<br>Note: Erase call waiting | OK<br>Note: Command valid |
| | +CCWA:,,1<br>Note: voice call waiting (no number) |
| AT+CCWA? | +CCWA: <n><br>OK |
| AT+CCWA=? | +CCWA: List of supported <n><br>OK |

# Calling Line Identification Restriction +CLIR

**Description:** This command controls the Calling Line Identification restriction supplementary service.

**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

**Syntax:** **Command syntax:** AT+CLIR=<n>
**Response syntax:** +CLIR:<n>,<m> (for AT+CLIR ?)

| Command | Possible responses |
|---|---|
| AT+CLIR=2 | OK<br>Note: Command valid |
| AT+CLIR ?<br>Note: Ask for current functionality | +CLIR:<n>,<m><br>OK<br>Note: <n> and <m> as defined above |

# Calling Line Identification Presentation +CLIP

**Description:** This command controls the calling line identification presentation supplementary service. When presentation of the CLI (Calling Line Identification) is enabled (and calling subscriber allows), +CLIP response is returned after every RING (or +CRING) result code.

**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…)

**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=1<br>Note: Enable CLIP | OK<br>Note: CLIP is enabled |
| AT+CLIP?<br>Note: Ask for current functionality | +CLIP:<n>,<m><br>OK<br>Note: <n> and <m> defined as below |
| | RING<br>Note: Incoming call<br>+CLIP: “0146290800”,129,1,,,”FRED”<br>Note: Incoming call with number and name presentation |
| | RING<br>Note: Incoming call<br>+CLIP: “0146290800”,129,1,, “8000204212FFFF”<br>Note: Incoming call with number and name presentation (UCS2 format) |
| AT+CLIP=0<br>Note: Disable CLIP presentation | OK<br>Note: Command valid |

# Connected Line Identification Presentation +COLP

**Description:** This command controls the connected line identification presentation supplementary service - useful for call forwarding of the connected line.

**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)

**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<br>Note: Activate COLP | OK<br>Note: Command valid |
| AT+COLP?<br>Note: Ask for current functionality | +COLP:1,1<br>OK<br>Note: COLP is enabled and provisioned |
| ATD146290928;<br>Note: Outgoing call | +COLP:"0146290928",129,,,"JOE"<br>or<br>+COLP:"0146290800",129,1,,,"8000204212FFFF" (UCS2 format)<br>OK<br>Note: Connected outgoing line number and name presentation |
| AT+COLP=0<br>Note: Deactivate COLP | OK<br>Note: Command valid |

# Advice of Charge +CAOC

**Description:** This refers to the Advice of Charge supplementary service (GSM 02.24 and GSM 02.86), which enables the subscriber to obtain information on call cost. With <mode>=0, the command returns the current call meter value (CCM) from the modem (ME).

If AOC is supported, the command can also enable unsolicited event reporting on CCM information.

The unsolicited result code +CCCM: <ccm> is sent when the CCM value changes. Deactivation of unsolicited event reporting is performed with the same command.

If AOC is supported, the Read command indicates whether unsolicited reporting is activated or not.

**Values:** **<mode>**

- **0** Query CCM value
- **1** Deactivate the unsolicited reporting of CCM value
- **2** Activate the unsolicited reporting of CCM value

**<ccm>**

String type; three bytes of the current call meter value in hexadecimal format (e.g., "00001E" corresponds to the decimal value 30); value is in home units and bytes are coded in a similar way as the ACMmax value in SIM

**Syntax:** **Command syntax:** AT+CAOC= <mode>

| Command | Possible responses |
|---|---|
| AT+CAOC=0<br>Note: Query CCM value | +CAOC: "000A08"<br>OK<br>Note: Display Current Call Meter value (CCM=2568) |
| AT+CAOC=1<br>Note: Deactivate unsolicited report of CCM value | OK<br>Note: CCM report deactivated |
| AT+CAOC=2<br>Note: Activate unsolicited report of CCM value | OK<br>Note: CCM report activated |
| AT+CAOC ?<br>Note: Request mode | +CAOC:<mode><br>OK<br>Note: Display unsolicited report mode (1 or 2) |
| AT+CAOC=?<br>Note: Request supported modes | +CAOC: (0-2)<br>OK<br>Note: 0,1,2 modes supported |

# Accumulated Call Meter +CACM

**Description:** This command resets the Advice of Charge for accumulated call meter value in SIM file $EF_{ACM}$. The ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is required to reset the value. If setting fails in an ME error, +CME ERROR: <err> is returned.

The Read command returns the current value of the ACM.

The ACM value (entered or displayed) is in hexadecimal format with 6 digits.

**Values:** **<pin2 passwd>** string type

**<acm value>** string type coded as <ccm> under +CAOC

**Syntax:** **Command Syntax:** AT+CACM=<pin2 passwd>

**Possible Response:** +CACM: <acm value>

| Command | Possible responses |
|---|---|
| AT+CACM?<br>Note: Request ACM value | +CACM: "000400"<br>OK<br>Note: Display ACM value (ACM=1024) |
| AT+CACM= 1234<br>Note: Request ACM reset, real PIN2 is "1234" | OK<br>Note: ACM value is reset |
| AT+CACM= 0000<br>Note: Request ACM reset with wrong PIN2 value | +CME ERROR: 16<br>Note: Incorrect password |
| AT+CACM ?<br>Note: Request ACM value | +CACM: "000000"<br>OK<br>Note: Display ACM value (ACM = 0) |

# Accumulated Call Meter Maximum +CAMM

**Description:** The set command sets the Advice of Charge related to accumulated call meter maximum value in SIM file $EF_{ACMmax}$. ACMmax contains the maximum number of home units the subscriber is allowed to consume. When ACM (see +CACM) reaches ACMmax, calls are prohibited. SIM PIN2 is required to set the value. If setting fails in an ME error, +CME ERROR: <err> is returned.

The Read command returns the current value of ACMmax.

The ACMmax value (entered or displayed) is in hexadecimal format with 6 digits.

**Values:** **<ACMmax>** String type coded as <ccm> under +CAOC. Value 0 disables ACMmax feature.

**<pin2 passwd>** String type

**Syntax:** **Command syntax:** AT+CAMM:<ACMmax>,<pin2 passwd>

| Command | Possible responses |
|---|---|
| AT+CAMM=”000400”,1234<br>Note: Request ACMmax update, PIN2 is “1234” | OK<br>Note: ACMmax updated to 1024 |
| AT+CAMM=”000400”,0000<br>Note: Request ACMmax update, PIN2 is “1234” | +CME ERROR: 16<br>Note: Incorrect password |
| AT+CAMM ?<br>Note: Request ACMmax value | +CAMM: “000400”<br>OK<br>Note: ACMmax = 1024 |

# Price Per Unit and Currency Table +CPUC

**Description:** The set command sets the parameters for Advice of Charge related to price per unit and the currency table in SIM file $EF_{PUCT}$. PUCT information can be used to convert the home units (as used in +CAOC, +CACM and +CAMM) into currency units. SIM PIN2 is required to set the parameters. If setting fails in an ME error, +CME ERROR: <err> is returned..

**Values:** **<currency>** String type

**<ppu>** String type

**<pin2 passwd>** String type

**Syntax:** **Command syntax:** AT+CPUC <currency>,<ppu>,<pin2 passwd>

| Command | Possible responses |
|---|---|
| AT+CPUC=”FFR”,”0.82”,1234<br>Note: Request Currency and Price per unit update | OK |
| AT+CPUC=”FFR”,”0.82”,1111<br>Note: Request Currency and PPU update (wrong PIN2) | + CME ERROR: 16<br>Note: Incorrect password |
| AT+CPUC?<br>Note: Request Currency and Price | +CPUC:”FFR”,”0.82”<br>OK<br>Note: Currency= “FFR”<br>Price per unit= “0.82” |

# Call Related Supplementary Services +CHLD

**Description:** This command manages call hold and multiparty conversation (conference call). Calls can be put on hold, recovered, released or added to a conversation.

**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).

**Syntax:** **Command syntax:** AT+CHLD=< n >

| Command | Possible responses |
|---|---|
| AT+CHLD=<n> | OK<br>Note: If n is within the defined values |
| AT+CHLD=? | +CHLD: (0-4, 11-17, 21-27)<br>OK |

# List Current Calls +CLCC

**Description:** This command returns a list of current calls.

**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** dialing (MO call)
- **3** alerting (MO call)
- **4** incoming (MT call)
- **5** waiting (MT call)

**<mode>** (teleservice):
- **0** voice
- **1** data
- **9** unknown

**<mpty>**
- **0** call is not one of multiparty (conference) call parties
- **1** call is one of multiparty (conference) call parties

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

**<type>** type of address byte in integer format

**<alpha>** optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook. *(for UCS2 format see commands examples +CLIP, +CCWA or +COLP)*

**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 |
|---|---|
| RING<br>Note: Incoming call | |
| AT+CLCC | +CLCC: 1,1,4,0,0,"0146294079",129<br>OK |
| ATA<br>Note: Answering the call | OK |
| AT+CLCC | +CLCC: 1,1,1,0,0,"0146294079",129<br>OK |
| ATD0146299704<br>Note: Outgoing Call | OK |
| AT+CLCC<br>Note: Before the phone called is ringing | +CLCC: 1,0,2,0,0,"0146294079",129<br>OK |
| AT+CLCC<br>Note: The phone called is ringing | +CLCC: 1,0,3,0,0,"0146294079",129<br>OK |
| AT+CLCC<br>Note: The call is being answered | +CLCC: 1,0,0,0,0,"0146294079",129<br>OK |

# Supplementary Service Notifications +CSSN

**Description:** This command refers to supplementary service related network initiated notifications.

**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>**
- **0** unconditional call forwarding is active
- **1** some of the conditional call forwardings are active
- **4** closed User Group call, with CUG <index>
- **5** outgoing calls are barred
- **6** incoming calls are barred
- **7** CLIR suppression rejected

**<code2>**
- **0** this is a forwarded call (MT call setup)
- **1** closed User Group call, with CUG <index>
- **2** call has been put on hold (during a voice call, <number> & <type> fields may be present)
- **3** call has been retrieved (during a voice call, <number> & <type> fields may be present)
- **4** multiparty call entered (during a voice call, <number> & <type> fields may be present)
- **5** call on hold has been released (during a voice call)
- **7** call is being connected (alerting) with the remote party in alerting state in Explicit Call Transfer operation (during a voice call)
- **8** call has been connected with the other remote party in Explicit Call Transfer operation (during a voice call, <number> & <type> fields may be present)

**<index>** Closed User Group index

**<number>** String type phone number

**<type>** Type of address

**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.

# Unstructured Supplementary Service Data +CUSD

**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 alphanumerical 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

**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>** is network string, converted in the selected character set

**<dcs>** is the data coding scheme received (GSM TS 03.38).

**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> ]

**Command Syntax To Send and Receive USSD:** AT+CUSD= <n> [,<str> [,<dcs>]]

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

**Values for Send and Receive USSD**

**<str>** The USSD string to be sent.

**<dcs>** The default alphabet and the UCS2 alphabet are supported.

When the product sends a USSD, an OK response is first returned, the intermediate +CUSD indication comes subsequently. In case of error, a +CUSD: 4 indication is returned.

# Closed User Group +CCUG

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

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

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 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

**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

**Note:** To activate the control of the CUG information by call, add [G] or [g] to the ATD command. Index and info values will be used.

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

# Chapter 11 – Data Commands

## Using AT Commands During a Data Connection

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

### 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 an AT command can be sent.

**Note:** The "+++" sequence only works with the **+ICF** command using the following settings:

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

### Switch from Offline to Online Mode

See the **ATO** command description.

# Bearer Type Selection +CBST

**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>) apply; whereas, for an incoming call, only the <ce> parameter applies.

**Notes:**

- For incoming calls, if <ce> is set to **T**, only and the network offers NT only or vice versa. Then the call is released.
- The values 2 and 3 for the <ce> parameter are equivalent to the former values of 100 and 101. Those values are managed for compatibility purposes, but they should no longer be used in the new code (2 as former 100 and 3 as former 101).

**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 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 |

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

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

# Select Mode +FCLASS

**Description:** This command puts the product into a particular operating mode (data).

**Values:** **<n>**

**0** Data

**Syntax:** **Command syntax**: AT+FCLASS= <n>

| Command | Possible responses |
|---|---|
| AT+FCLASS=?<br>Note: Test command | +FCLASS: (0)<br>OK |
| AT+FCLASS=?<br>Note: Test command | +FCLASS: (0)<br>OK |
| AT+FCLASS=0<br>Note: Data mode requested | OK<br>Note: Command valid |
| | OK<br>Note: Command valid |
| AT+FCLASS?<br><br>Note: Current value | +FCLASS:<br>OK<br>Note: Command valid |

# Service Reporting Control +CR

**Description:** This command enables a more detailed type of service reporting in the case of incoming or outgoing data calls. Before sending the CONNECT response to the application, the product will specify the type of data connection that has been set up.

These report types are:

**+CR: ASYNC** For asynchronous transparent

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

**Values:** **<mode>**

**0** Disable extended reports

**1** Enable extended reports

**Syntax:** **Command syntax:** AT+CR=<mode>

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

# Cellular Result Codes +CRC

**Description:** This command shows 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. |

**Values:** **<mode>**

**0** Disable extended reports
**1** Enable extended reports

**Syntax:** **Command syntax:** AT+CRC=<mode>

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

# DTE-DCE Local Rate Reporting +ILRR

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

**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.

**Syntax:** **Command syntax:** AT+ILRR = <value>

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

# Radio Link Protocol Parameters +CRLP

**Description:** This command changes the radio link protocol parameters used for non transparent data transmission.

**Values:**

| Value: | Range: | Description: |
|---|---|---|
| **<iws>** | **0-61** | Down window size, (default is 61) |
| **<mws>** | **0-61** | Up window size, (default is 61) |
| **<T1>** | **40-255** | Acknowledgement timer in units of 10ms, (default is 48) |
| **<N2>** | **1-255** | Retransmission attempts, (default is 6) |
| **<ver>** | **0-1** | Version number |
| **0** | | V42bis is not supported |
| **1** | | V42bis is supported |

**Syntax:** **Command syntax:** AT+CRLP=<iws>,<mws>,<T1>,<N2>, <ver>

| Command | Possible responses |
|---|---|
| AT+CRLP=?<br>Note: Test command | +CRLP: (0-61),(0-61),(40-255),(1,255),(0)<br>OK<br>Note: V42bis not supported |
| AT+CRLP=?<br>Note: Test command | +CRLP: (0-61),(0-61),(40-255),(1,255),(0,1)<br>OK<br>Note: V42bis supported |
| AT+CRLP=61,61,48,6,0<br>Note: Set new parameters | OK<br>Note: Command valid |
| AT+CRLP?<br>Note: Current values | AT+CRLP: 61,61,48,6,0<br>Note: Command valid |

# Other Radio Link Parameters +DOPT

**Description:** This command modifies some supplementary radio link protocol parameters.

**Values:**

**<reset_allowed>**

**0** Data communication is hung up in case of bad radio link.

**1** Default. Data communication continues in case of bad radio link (possible loss of data**)**

**<dtx_allowed>**

**0** Normal mode

**1** Default. Economic battery mode (not supported by all networks)

**Syntax:** **Command syntax:** AT+DOPT=<reset_allowed>,<dtx_allowed>

| Command | Possible responses |
|---|---|
| AT+DOPT=1<br>Note: Set new parameters (2nd value is the default) | OK<br>Note: Command valid |
| AT+DOPT+?<br>Note: Test command | (0,1),(0,1)<br>OK<br>Note: DTX is supported |
| AT+DOPT=1,1<br>Note: Set new parameters | OK<br>Note: Command valid |
| AT+DOPT?<br>Note: Current values | 1,1<br>OK<br>Note: Command valid |

# Select Data Compression %C

**Description:** This command enables or disables data compression negotiation if this feature is supported on the product.

**Values:** **<n>**

- **0** no compression (default)
- **2** V42bis compression if supported

**Syntax:** **Command syntax: AT%C<n>**

| Command | Possible responses |
|---|---|
| AT%C0<br>Note: Command | OK<br>Note: Feature supported |
| AT%C2<br>Note: Command | OK<br>Note: V42bis supported |
| AT%C?<br>Note: Current value | 2<br>OK<br>Note: Command valid |

# V42bis Data Compression +DS

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

**Values:**

**< dir >** Specifies the desired direction(s) of operation of the data compression function; from the DTE point of view, (default is 3)

- **0** Negotiated … no compression
- **1** Transmit only
- **2** Receive only
- **3** Both directions, accept any direction. Default.

**< neg >** Specifies whether or not the DCE should continue to operate if the desired result is not obtained, (default is 0)

- **0** Do not disconnect if V.42 bis is not negotiated by the remote DCE as specified in <dir>. Default.
- **1** Disconnect if V.42 bis is not negotiated by the remote DCE as specified in <dir>

**< P1 >** Specifies the maximum number of dictionary entries that should be negotiated, Range is 512 to 2048. Default is 2048.

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

**Syntax:** **Command syntax:** AT+DS=[[<dir>][,[<neg>][,[<P1>][,[<P2>]]]]

| Command | Possible responses |
|---|---|
| AT+DS=?<br>Note: Test command | +DS: (0-3),(0,1),(512-2048),(6-250)<br>OK |
| AT+DS=3,0,2048,250<br>Note: Set new parameters | OK<br>Note: Command valid |
| AT+DS?<br>Note: Current values | +DS: 3,0,2048,20<br>OK<br>Note: Command valid |

# V42bis Data Compression Report +DR

**Description:** This command determines whether or not the use of V42bis is allowed for an incoming or outgoing data call, if this feature is provided by the product. The intermediate result code represents current DCE-DCE data compression type. The format of this result code is as follows:

| | |
|---|---|
| +DR: NONE | Data compression is not in use |
| +DR: V42B | Rec. V.42 bis is in use in both directions |
| +DR: V42B RD | Rec. V.42 bis is in use in receive direction only |
| +DR: V42B TD | Rec. V.42 bis is in use in transmit direction only |

The +DR intermediate result code, if enabled, is issued before the final result code, before the +ILRR intermediate report and after the service report control +CR.

**Values:** **<status>** State of the V42bis

**0** Disable. Default value.

**1** Enable

**Syntax:** **Command syntax:** AT+DR=<status>

| Command | Possible responses |
|---|---|
| AT+DR=?<br>Note: Test command | +DR: (0-1)<br>OK |
| AT+DR=1<br>Note: Reporting enabled | OK<br>Note: Command valid |
| AT+DR?<br>Note: Current value | +DR: 1<br>OK<br>Note: Command valid |

# Select Data Error Correcting Mode \N

**Description:** If this feature is provided by the product, this command controls the preferred error correcting mode for a data connection. It can only be used for transparent data transmission.

If the MNP2 feature is provided, the product authorizes MNP error correction mode.

**Values:** **<n>**

**0** Default. Disables error correction mode

**5** Selects MNP error correction mode

**Note:** +E prefixed commands of V.25 ter are not used.

**Syntax:** **Command syntax:AT\N<n>**

| Command | Possible responses |
|---|---|
| AT\N0<br>Note: no error correction | OK |
| AT\N?<br>Note: Current value | 0<br>OK<br>Note: Command valid |
| AT\N4 | +CME ERROR: 3 |

# Chapter 12 – V.24 and V.25 Commands

## Important

All commands described hereafter will to the currently selected (and used) UART.

## Fixed DTE Rate +IPR

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

**Notes:**

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

**Values:** **<value>** Baud rates that can be used by the DCE

**0** Enables autobauding
**300**
**600**
**1200**
**2400**
**4800**
**9600**
**19200**
**38400**
**57600**
**115200**

**Syntax:** **Command syntax:** AT+IPR=<value>

| Command | Possible responses |
|---|---|
| AT+IPR? | +IPR: 9600<br>OK<br>Note: Current rate is 9600 bps |
| AT+IPR=? | +IPR: (0,2400,4800,9600,19200,38400,57600,115200), (300,600,1200)<br>OK<br>Note: Possible values, according to V25ter Recommendation:<br>The first set of values indicates the range of auto-detectable baud rates (including 0). The second set of values indicates the baud rates supported by the DCE but not auto-detectable. |
| AT+IPR=38400 | OK<br>Note: Disable autobauding and set rate to 38400 bps |
| AT+IPR=0 | OK<br>Note: Enable autobauding |

# DTE-DCE Character Framing +ICF

**Description:** This command determines the local serial port start-stop (asynchronous) character framing that the DCE uses.

**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) |

**Note:** All character framing formats settings of the serial interface (i.e., 801, 8E1, 8S1, 8N1, 7N1, 7O1, 7E1, 7S1 and 7N2) are supported on autobauding operation.

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

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

# DTE-DCE Local Flow Control +IFC

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

**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 as it assumes that this signal is not connected.
- As soon as the DCE detects RTS high the signal acts on it. Therefore subsequent RTS transition to OFF will prevent the DCE from sending any further data in both online and offline modes.
- This behavior allows the user to use the default settings (hardware flow control) and 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) |

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

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

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

# Set DCD Signal &C

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

**Values:** **<n>**

| | |
|---|---|
| **0** | DCD always on |
| **1** | DCD matches the state of the remote modem's data carrier |

**Syntax:** **Command syntax:** AT&C <n>

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

# Set DTR Signal &D

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

**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

**Syntax:** **Command syntax:** AT&D<n>

| Command | Possible responses |
|---|---|
| AT&D0<br>Note: The DTR signal is ignored | OK<br>Note: Command valid |
| AT&D1<br>Note: Modem switches from data to command mode when DTR switches from ON to OFF | OK<br>Note: Command valid |
| AT&D2<br>Note: Upon DTR switch from ON to OFF, the call is released | OK<br>Note: Command valid |

# Set DSR Signal &S

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

**Values:** **<n>**

- **0** DSR always on
- **1** DSR off in command mode. DSR on in data mode.

**Syntax:** **Command syntax:** AT&S<n>

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

# Back to Online Mode O

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

**Values:** No parameters

**Syntax:** **Command syntax:** ATO

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

# Result Code Suppression Q

**Description:** This command determines whether the mobile equipment sends result codes or not.

**Values:** **<n>**

- **0** DCE transmit result codes
- **1** Result codes are suppressed and not transmitted

**Syntax:** **Command syntax:** ATQ<n>

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

# DCE Response Format V

**Description:** This command determines the DCE response format, with or without header characters <CR><LF>. Result codes are provided as numeric or verbose.

**Values:**

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

**Syntax:** **Command syntax:** ATV<n>

| Command | Possible responses |
|---|---|
| ATV0<br>Note: DCE transmits limited headers and trailers and numeric result codes | 0<br>Note: Command is valid (0 means OK) |
| ATV1<br>Note: DCE transmits full headers and trailers and verbose response text | OK<br>Note: Command valid |

# Default Configuration Z

**Description:** This command restores the configuration profile. Any call is released.

**Values:** No parameters

**Syntax:** **Command syntax:** ATZ

| Command | Possible responses |
|---|---|
| ATZ | OK<br>Note: Command valid |

# Save Configuration &W

**Description:** This command writes the active configuration to a non-volatile memory (EEPROM). For description of the stored parameters, refer to Appendix A.

**Values:** No parameters

**Syntax:** **Command syntax:** AT&W

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

# Auto-Tests &T

**Description:** This command runs various auto-tests.

**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** Perform 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)

**Syntax:** **Command syntax:** AT&T<n>

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

# Echo E

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

**Values:** **<n>**

- **0** Characters are not echoed
- **1** Characters are echoed

**Syntax:** **Command syntax:** ATE<n>

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

# Restore Factory Settings &F

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

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

**Values:** **<n>**

- **0** Restore factory settings

**Note:** No other value is supported.

**Syntax:** **Command syntax:** AT&F<n>

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

# Display Configuration &V

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

**Values:** **<n>**

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

**Syntax:** **Command syntax:** AT&V<n>
The parameters displayed are the following:
Q: val 1, V: val 2, S0: val 3, S2: val 4, S3: val 5, S4: val 6, S5: val 7,
+CR: val 8, +CRC: val 9, +CMEE: val 10, +CBST: val 11,
+SPEAKER: val 12, +ECHO: val 13, &C: val 14, &D: val 15, %C: val 16,
+IPR: val 17, +ICF: val 18, +IFC: val 19

| Command | Possible responses |
|---|---|
| AT&V<br>Note: Display active parameters in RAM | Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008<br>+CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1<br>+SPEAKER:0 +ECHO:0,0 &C:1 &D:2 %C:0<br>+IPR:9600 +ICF:3,4 +IFC:2,2<br>OK<br>Note: Done<br>For Echo the first value corresponds to Echo cancellation 1. |

# Request Identification Information I

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

**Values:** **<n>**

- **0** Displays manufacturer followed by model identification. Equivalent to +CGMI and +CGMM.
- **3** Displays revision identification. Equivalent to +CGMR.
- **4** Displays modem configuration in RAM. Equivalent to &V0.
- **5** Displays modem configuration in EEPROM. Equivalent to &V1.
- **6** Displays modem data features. Lists the supported data rates and data modes.
- **7** Displays modem voice features.

Other values: OK string will be sent back.

**Syntax:** **Command syntax:** ATI<n>

| Command | Possible responses |
|---|---|
| ATI0<br>Note: Manufacturer and model identifications | WAVECOM MODEM<br>900P<br>OK<br>Note: GSM 900 MHz primary band |
| ATI3<br>Note: Revision identification | 657_09gg.Q2406B 2015268 100506 17:01<br>OK<br>Note: Software release 6.57, generated on the 5th of October 2006 |
| ATI6<br>Note: Modem data features | DATA RATES:<br>AUTOBAUD,300,1200,1200/75,2400,4800,9600,14400<br>DATA MODES: T/NT,ASYNCHRONOUS<br>OK<br>Note: Done |
| ATI7<br>Note: Modem voice features | SPEECH CODINGS: FR,EFR,HR,AMR<br>OK<br>Note: Done |

# Multiplexing Mode +WMUX

**Description:** This command manages the data/AT commands in multiplexing mode. See Appendix B for the Data/Commands multiplexing protocol description.

**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).

**Note:** The Mulitplexing mode is available to only one UART. If this mode is available on UART1 and the AT+WMUX=1 command is sent through UART2, the multiplexing mode will be available on UART2 and disabled on UART1.

**Syntax:** **Command syntax:** AT+WMUX=<mode>

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

# Chapter 13 – Specific AT Commands

## Cell Environment Description +CCED

**Description:** This command can be used by the application to retrieve the parameters of the main cell and of up to six neighboring cells.

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

- On request by the application
- Automatically by the product every 5 seconds.

Automatic mode is not supported during registration.

**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** Neighbor1 to Neighbor6:

- **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** Main Cell Timing Advance

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

**16** <requested dump>=1 + <requested dump>=2 + <requested dump>=4 + Neighbor1 to Neighbor6 Timing Advance (only available for mode=0) Neighbor1 to Neighbor6 Timing Advance are only available in Idle Mode.

**<CsqStep>** Indicates the step required for RSSI indications between 2 + CSQ unsolicited response. The range of this step is [1,5]. Default value: 1. If this field is not indicated, the previous value is used.

**Notes:**

- The response for the requested dump 1, 2, and 4 will be:
  +CCED:<value>, … , <value n>
  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 and two consecutive commas are sent.
- The response for the requested dump 8 will be a +CSQ response and not a +CCED. The 7.07 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 is equal or greater than the value <CsqStep>. So the <rssi> level between 2 successive +CSQ responses is equal or greater than <CsqStep>. Automatic shots are supported in idle mode and during communication. The activation or deactivation of this flow (8) does not affect the other flows.

- Combination of the requested dump is supported (addition of the values 1, 2, 4, and 8):

| Value | Requested Dump | Value | Requested Dump |
|---|---|---|---|
| 1 | +CCED response: Main Cell only | 9 | +CSQ response; then +CCED response with Main Cell only |
| 2 | +CCED response: Neighbors 1 to 6 | 10 | +CSQ response; then +CCED response with Neighbors 1 to 6 |
| 3 | +CCED response: Main Cell; then Neighbors 1 to 6 | 11 | +CSQ response; then +CCED response with Main Cell; then Neighbors 1 to 6 |
| 4 | +CCED response: Timing Advance Only | 12 | +CSQ response; then +CCED response with Timing Advance Only |
| 5 | +CCED response: Main Cell; then Timing Advance | 13 | +CSQ response; then +CCED response with Main Cell; then Timing Advance |
| 6 | +CCED response: Neighbors 1 to 6; then Timing Advance | 14 | +CSQ response; then +CCED response with Neighbors 1 to 6; then Timing Advance |
| 7 | +CCED response: Main Cell; then Neighbors 1 to 2, then Timing Advance | 15 | +CSQ response; then +CCED response: Main Cell, then Neighbors 1 to 6, then Timing Advance |
| 8 | +CSQ response: Main Cell RSSI indications | 16<br><br><br>---<br>No value | +CCED response: Main Cell, then Neighbors 1 to 6, then Main Cell Timing Advance, then Neighbor1 to Neighbor6 Timing Advance<br>---<br>Last value used for CCED request or 15 |

- If requested dump parameter is not provided, one of the last +CCED commands sill be used (or 15 by default) will be used.
- Values of MCC/MNC are set to 0 in the case of “No service”.

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

| Command | Possible responses |
|---|---|
| AT+CCED=0<br>Note: Last request was AT_CCED=0,3 (main cell and neighbors 1 to 6): you can see MCC,MNC sequences (here 208,20) | +CCED:208,20,0002,0418,37,706,24,,,0,,,0,208,20,0006,989b,37,835,20,208,,20,0002,02a9,37,831,12,208,20,0101,7966,34,818,508,20,0006,9899,39,713,9,208,20,0002,0a72,33,711,12,208,20,0101,03fb,36,824,10,1<br>OK |
| AT+CCED=0,1<br>Note: Only Main Cell request | +CCED:208,20,0002,0418,37,706,25,,,0,,,0<br>OK |
| AT+CCED=0,1<br>Note: Call in progress: RxLev and RxQual are empty, RxLevFull, RxLevSub, RxQualFull, and RxQualSub have data | +CCED:208,10,189C,,19,85,,31,32,,0,0<br>OK |
| AT+CCED=1,8,1 | OK<br>+CSQ: 12,99<br>+CSQ: 13,99 |
| AT+CCED=0,16<br><br><br><br><br>Note: idle mode | +CCED:<br>208,20,0006,0418,54,789,,,,255,,,0,208,20,0,0006,57,1018,20,208,01,7500,6497,17,55,17,208,10,54c4,f0ed,31,700,9,208,20,0006,7d9a,50,1023,8,208,20,0002,9a29,48,1015,7,1,1,1,2,1,2<br>OK<br>Note: 1,1,1,2,1,2 correspond to the Main Cell Timing Advance and 5 Neighbors Timing Advance |
| AT+CCED=0,16<br><br><br><br><br>Note: dedicated mode | +CCED:<br>208,20,0006,0418,54,789,,19,19,0,0,,,,,,41,801,6,,,,,57,1018,20,,,,,48,1015,10,,,,,57,1006,4,,,,,50,1023,7,,,,,57,814,3,1,,,,,,<br>OK<br>Note: Neighbors Timing Advances are not available in dedicated mode |
| AT+CCED=1,16 | +CME ERROR: 3 |

# General Indications +WIND

**Description:** This command provides a general mechanism to send unsolicited non-standardized indications to the application. The indicators 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.
- NITZ indication (Network Information and Time Zone)

For each of these indications, a "bit flow" has to be indicated.

**Values:** **<IndLevel>**

| | |
|---|---|
| **0** | No unsolicited "+WIND: <IndNb>" will occur. **Default**. |
| **1** (bit-0) | Hardware SIM Insert/Remove indications 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) |
| **4096** (bit-12) | Hardware rack open/closed indication |
| **8192** (bit-13) | NITZ indication |
| **16384** (bit-14) | SMS service ready indication |

Combination (addition of the values) is used to allow more than one indication flow: **0 ≤ IndLevel ≤ 32767**

- To activate a specific WIND indication, <IndLevel> must have a value described above. AT+WIND=16384 only activates SMS service indication.
- To activate several WIND indications, <IndLevel> must have a value just before the last indication required.
  AT+WIND=32767 all unsolicited indications.

**<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. |
| **13** | The rack has been detected as Closed. |

**14** The rack has been detected as Open.

**15** The modem received a NITZ information message from the network.

**16** SMS and SMS CB services are ready.

**For Event 10:**

**<phonebook>**: SIM phonebook

"**SM"**

**"FD"**

**"ON"**

**"SN"**

**"EN"**

**<status>**:

**0** Not Reloaded from SIM (no change since last init or SIM remove)

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

**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 commas without checksum are displayed (,,).

**For Event 15:**

**<Full name>:** String. Updated long name for current network.

**<Short name>:** String. updated short name for current network.

**<Local time zone>:** Signed integer. Time Zone indicates the difference, expressed in quarters of an hour, between the local time and GMT.

**<Universal time and local time zone>:** String, Universal Time and Time Zone, in format "yy/MM/dd,hh:mm:ss±zzz" (Year/Month/Day,Hour:Min:Seconds± Time Zone).

The Time Zone indicates the difference, expressed in quarters of an hour, between the local time and GMT.

**<LSA Identity>:** Hexa string. LSA identity of the current cell in hexa format (3 bytes).

**<Daylight Saving Time>:** Integer (0-2). When the LTZ is compensated for DST (Daylight Saving Time or summertime), the serving PLMN shall provide a DST parameter to indicate it. The adjustment for DST can be + 1h or +2h.

**Note:** For the NITZ indication, all the fields indicated here are optional. That is why there is an index related to each of the following:

- 1: Full name for network
- 2: Short name for network
- 3: Local time zone
- 4: Universal time and local time zone
- 5: LSA identity
- 6: Network Daylight Saving Time

**Syntax:**

**Command syntax:** AT+WIND= <IndLevel >

| Command | Possible Responses |
|---|---|
| AT+WIND? | +WIND: 0<br>OK |
| AT+WIND=255 | OK |
| Note: The SIM has been removed. | +WIND: 0<br>Note :The SIM presence pin has been detected as "SIM removed" |
| Note: The SIM has been inserted. | +WIND: 1<br>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 |
| Note: The modem received a NITZ information message | +WIND: 15,1,"Cingular Extended",2,"Cingular",3,"+08",<br>4,"03/14/27,16:59:48+08",5,"123456",6,"2" |

**Additional Notes:**

- 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>”]
- Or for event 15 (NITZ indication):
  +WIND: <event>[,1,"Full name>"][,2,"<Short name>"][,3,"<Local time zone>"][,4,"<Universal time and local time zone>"][,5,"<LSA identity>"][,6,"<Daylight Saving Time>"]

# Analog Digital Converter Measurements +ADC

**Description:** This command gets the (DC level * 1024) of ADC A and ADC B, and possibly ADC C. These voltages are coded on 10 bits.

**Values:**

**<n>**
**0** Select 2 converters
**1** Select 3 converters

**<ADCValA>**
ADC A value, coded on 10 bits. The value returned includes the resistor bridge. Values are updated every 10 seconds. Displayed on modes 0 and 1.

**<ADCValB>**
ADC B value, coded on 10 bits. Displayed on modes 0 and 1.

**<ADCValC>**
ADC C value, coded on 10 bits. Displayed on mode 1 only.

**<ADCValD>**
ADC D value, coded on 10 bits. Displayed on mode 1 only.

**Syntax:**

**Command syntax:** AT+ADC<n>
**Response syntax:** +ADC: <ADCValA>,<ADCValB>[,<ADCValC>][,<ADCValD>]

| Command | Possible responses |
|---|---|
| AT+ADC=?<br>Note: Ask for the list of possible values | +ADC: (0-1)<br>Note: possible values 0 or 1 |
| AT+ADC=0<br>Note: Select 2 converters (mode 0) | OK<br>Note: 2 converters mode selected |
| AT+ADC?<br><br>Note: Ask for the current values of converters in mode 0 | +ADC: 500,412<br>OK<br>Note: ADC A, ADC B on 10 bits |
| AT+ADC=1<br>Note: Select extended mode (mode 1) | OK<br>Note: Extended mode selected |

# Mobile Equipment Event Reporting +CMER

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

**Values:**

**<keyp> (keypad)**

- **0** No keypad event reporting.
- **1** Keypad event reportings are routed using unsolicited code: +CKEV: <key>, <press> only those key pressings, which are not caused by +CKPD are indicated.
- **2** Keypad event reportings are routed using unsolicited code: +CKEV: <key>, <press> 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 (DTE).

**<key>** Keyboard map is (5,5)

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 |

**<press>**

- **1** key press
- **0** key release

**<indresp>** Indicator order number (as specified for +CIND)

**<value>** New value of the indicator

**Syntax:**

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

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

**Response Syntax:** +CIEV: <indresp>, <value> (indicator event report)

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

# Read Language Preference +WLPR

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

**Values:** **<index>** Offset in the available languages range (SIM dependent)

**<value>** Values for language. See Recommendation 3GPP TS 23.038. Language example:

| <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 |

**Syntax:** **Command syntax:** AT+WLPR= <index >
**Response syntax:** +WLPR: <value>

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

# Write Language Preference +WLPW

**Description:** Write a Language Preference value in EF-LP.

**Values:** **<index>** Offset in the available languages range (SIM dependent)

**<value>** See <values> examples above (Read Language Preference +WLPR)

**Syntax:** **Command syntax:** AT+WLPW=<index >,<value>
**Response syntax:** OK or +CME ERROR: <err>

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

# Read GPIO Value +WIOR

**Description:** Read the requested GPI or GPIO pin value.

**Notes:**

- 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.
- When the BT chip is switched on, the GPIO5 is not available anymore.

**Values:**

**<index>**

Up to ten I/O ports are available. The <index> value is between 0 and 9.

**<value>**

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

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

**Syntax:**

**Command syntax:** AT+WIOR=<index>

**Response syntax:** +WIOR: <value>

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

# Write GPIO Value +WIOW

**Description:** Set the requested GPO or GPIO pin value.

**Notes:**

- 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.
- When the BT chip is switched on, the GPIO5 is not available anymore. It is not possible to change the state of the GPIO using this command.

**Values:**

**<index>**

Up to ten I/O ports are available. The <index> value is between 0 and 9.

**<value>**

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

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

**Syntax:**

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

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

# Input/Output Management +WIOM

**Description:** This command sets the default GPIO's configuration (input or output) after reset, and each GPIO default value (if set as an output) after reset.

**Notes:**

- This command is allowed only on a GPIO not allocated by the Open-AT embedded application or for bus operations.
- When UART is activated, GPIOs 0 and 5, GPO2 and GPI are not available anymore. When you try to do writable or readable operations on these I/O, CME ERROR: 3 will be returned. This applies for modems running AT X50 software and supporting the multi-UART feature.
- When the BT chip is switched on, the GPIO5 is not available anymore. It is not possible to change the state of the GPIO using this command.

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

**0** Input

**1** Output. Default.

Default value: 2047 (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.

**1** Set

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.
- <GpioVal> bit values for GPI are ignored.

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

| Command | Possible responses |
|---|---|
| AT+WIOM? | +WIOM: 2047,0<br>OK<br>On reset, all GPIOs are set to 0, as an output |
| AT+WIOM=? | +WIOM: (0-2047),(0-2047)<br>OK<br>Range allowed for the parameters. |
| AT+WIOM=254<br>Set GPIO 0 as an input, and all others as outputs | OK |
| AT+WIOM=,128<br>Set GPIO 3; default output value to 1 | OK |
| AT+WIOM=,128<br>Note: Set GPIO 8 or GPIO12 or GPIO7; default output value to 1 | OK |

# Abort Command +WAC

**Description:** This command allows SMS, SS and PLMN selection related commands to be aborted.

**Values:** No parameters

**Syntax:** **Command syntax:** AT+WAC

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

**Example 1**

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

**Example 2**

| Command | Possible responses |
|---|---|
| AT+CCFC=0,2<br>Note: Query status of Call Forwarding service | |
| AT+WAC<br>Note: Abort the request of the query of the Call Forwarding service | CME ERROR: 551<br>Note: Query of Call Forwarding service request failed |

# Play Tone +WTONE

**Description:** This command allows a tone to be played on the current speaker or on the buzzer. Frequency, gain and duration can be set.

**Values:**

**<mode>**
- **0** Stop playing.
- **1** Play a tone

**<dest>** Sets the destination (mandatory if <mode>=1)
- **1** Speaker
- **2** Buzzer

**<freq>** Sets tone frequency (in Hz) (mandatory if <mode>=1).

**<freq2>** Sets the 2nd tone frequency (in Hz) (mandatory if <mode>=1). Available with speaker only.

**If <dest>=1** speaker:
Range is 1 Hz to 3999 Hz

**If <dest>=2** buzzer:
Range is between 1 Hz and 50000 Hz.

**<gain>** Sets the tone gain for the <freq>. The default is 9.

**<gain2>** Sets the tone gain for the <freq2>. The default 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>** Sets tone duration (unit of 100 ms).
Range is 0 to 50. Default 0. 1 -> 0,1 s., 50 -> 5 s.)
When this <duration>=0, the duration is infinite, and the tone can be stopped by AT+WTONE=0.

**Note:** The frequency <freq2> and gain <gain2> are allowed for the speaker only.

**Caution:** Hardware can only generate the following frequencies:
Freq = (13 000 000 / (N * 64))
N: Interger value in the recommended range 1 to 2048.

With N=1, the frequency 203 125 Hz is generated.
With N=2048, the frequency 99.18 Hz is generated.
Some noise problems have been detected if the frequency is below 100 Hz.
The lowest frequency possible is 12 Hz.

**Syntax:**

**Command syntax:** AT+WTONE=<mode>[,<dest>,<freq>,<gain>,<duration>[,<freq2>,[gain2>]]]]]
**Response syntax:** OK or +CME ERROR: <err>

| Command | Possible responses |
|---|---|
| AT+WTONE=1,1,300,9,50<br>Note: Play a tone | OK<br>Note: Done |
| AT+WTONE=0<br>Note: Stop playing | OK<br>Note: Done |
| AT+WTONE=?<br>Note: Test command | OK<br>Note: Done |
| AT+WTONE?<br>Note: Current value | ERROR |
| AT+WTONE=1,1,300,9,50,600,9<br>Note: Play a tone with 2 frequencies (allowed with speaker only) | OK<br>Note: Done |
| AT+WTONE=1,2,300,9,50,600,9<br>Note: Play a tone with 2 frequencies with the buzzer | +CME ERROR: 3 (Note: Dual frequency for speaker only) |

# Play DTMF Tone +WDTMF

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

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

**Values:** **<mode>**
**0** Stop playing.
**1** Play a DTMF tone

**<dtmf>** Sets the DTMF to play in (mandatory if <mode>=1).
Value must be in {0-9,*,#,A,B,C,D}

**<gain> (0-15)** Sets tone gain. The values are identical to those of the +WTONE (speaker) command. Range is 0 to 15 (see array on previous page). By default, the value is 9.

**<duration> (0-50)** Sets the tone duration (unit of 100 ms).
Range 0 to 50. Default 0 (1-> 0,1 s., 50 -> 5 s.)
When this parameter is 0 (default value), the duration is infinite, and the DTMF tone can be stopped by AT+WDTMF=0.

**Syntax:** **Command syntax:** AT+WDTMF=<mode>[,<dtmf>,<gain>,<duration>]
**Response syntax**: OK or +CME ERROR: <err>

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

# Downloading +WDWL

**Description:** This command switches the product to download mode.

AT+WDWL allows the download process to launch on UART1 only.

Downloading is performed using the 1K-XMODEM protocol.

**Important Note:** Software damages may occur if power is lost or if a hardware reset occurs during the downloading phase. This would seriously affect the modem.

**Values:** No parameters

**Syntax:** **Command syntax:** AT+WDWL

| Command | Possible responses |
|---|---|
| AT+WDWL<br>Note: Switch on downloading mode | +WDWL: 0<br>Note: Start the downloading |
| | …<br>Note: Downloading in progress |
| | AT+CFUN=1<br>Note: Reset the product at the end |
| | OK<br>Note: Reset completed. New software running |
| AT+WDWL? | +WDWL: VO2.12<br>OK |

# Voice Rate +WVR

**Description:** This command allows the voice rate for bearer voice to be configured for outgoing and incoming calls.

**Note:** According to the modem's capabilities, the following voice coding type are allowed:

- Modem that supports AMR: FR, EFR, AMR-FR, AMR-HR are supported.
- Modem that does not support AMR: FR, EFR, HR are supported.

**Values:** Voice coding type.

| Voice Coding Type | Preferred Type | Other Supported Types | Default Values |
|---|---|---|---|
| 0 | FR | | Default incoming voice calls rate |
| 1 | EFR | FR | |
| 2 | HR | FR | |
| 3 | FR | HR | |
| 4 | HR | EFR | |
| 5 | EFR | HR, FR | Default outgoing voice calls rate |
| 6 | AMR-FR | EFR, AMR-HR, FR | |
| 7 | AMR-FR | EFR, AMR-HR, HR, FR | |
| 8 | AMR-HR | HR, AMR-FR, EFR, FR | |
| 9 | AMR-HR | AMR-FR, EFR, FR | |
| 10 | AMR-HR | AMR-FR, FR | |
| 11 | AMR-HR | HR, AMR-FR, FR | |
| 12 | AMR-FR | AMR-HR, FR | |
| 13 | AMR-FR | FR, AMR-HR | |
| 14 | AMR-FR | FR, AMR-HR, HR | |
| 15 | EFR | FR, HR | |

**Command syntax:** AT+WVR= <out_coding_type>[,<in-coding_type>]
AT+WVR= [<out_coding_type>],<in-coding_type>
AT+WVR? +WDR: <out_coding_type>,<in-coding_type>
OK

**Note:** <out_coding_type> is related to outgoing calls; <in-coding_type> to incoming calls.

| Command | Possible responses |
|---|---|
| AT+WVR=1<br>Note: Configure voice type FR and EFR for outgoing calls only | OK<br>Note: Bearer is configured for outgoing calls |
| AT+WVR=1,4<br>Note: Configure voice type FR and EFR for outgoing calls and HR and EFR for incoming calls | OK<br>Note: Bearer is configured for outgoing calls and incoming calls |
| AT+WVR=,4<br>Note: Configure voice type HR and EFR for incoming calls | OK<br>Note: Bearer is unchanged for outgoing calls and configured for incoming calls |
| AT+WVR=6<br>Note: Syntax error | +CME ERROR: 3<br>Note: Syntax error |
| AT+WVR?<br>Note: Ask for the current values | +WVR: 1,1<br>OK |
| AT+WVR=? | +WVR: (0,2,3),(0,2,3)<br>Note: If Half Rate is available |
| AT+WVR=? | +WVR: (0,1),(0,1)<br>Note: If EFR available. |
| AT+WVR=? | +WVR: (0),(0)<br>Note: If neither HR nor EFR is available |
| AT+WVR=? | +WVR: (0-5,15),(0-5,15)<br>Note: If HR and EFR are available |
| AT+WVR=? | +WVR:<br>(0,2,3,10,11,12,13,14),(0,2,3,10,11,12,13,14)<br>Note: If Half Rate and AMR are available |
| AT+WVR=? | +WVR: (0,1,6,9,10,11,12,13),(0,1,6,9,10,11,12,13)<br>Note: If EFR and AMR are available |
| AT+WVR=? | +WVR: (0,10,12,13),(0,10,12,13)<br>Note: If AMR is available |
| AT+WVR=? | +WVR: (0-15),(0-15)<br>Note: If HR,EFR, and AMR are available |

# Data Rate +WDR

**Description:** This command allows the data rate for bearer data to be configured for outgoing and incoming calls.

**Values:** **<out_coding_type>**: Data Coding Type for Outgoing Calls.

| Data Coding Type | Preferred Type | Other Supported Types | Default Values |
|---|---|---|---|
| 0 | FR | | Default incoming voice calls rate |
| 1 | HR | FR | |
| 2 | FR | HR | |
| 3 | FR | HR | |

**<in_coding_type>**: Data Coding Type for Incoming Calls.

| Data Coding Type | Type | Default Values |
|---|---|---|
| 0 | HR | |
| 1 | FR | Default incoming data calls rate |

**Command syntax:** AT+WDR= <out_coding_type>[,<in-coding_type>]
AT+WDR= [<out_coding_type>],<in-coding_type>
AT+WDR? +WDR: <out_coding_type>[,<in-coding_type>

**Note:** <out_coding_type> is related to outgoing calls, and <in_coding_type to incoming calls.

| Command | Possible responses |
|---|---|
| AT+WDR=? | +WDR: (0-2),(0-2)<br>Note: If Half Rate is available in both directions |
| AT+WDR=? | +WDR: (0),(1)<br>OK<br>Note: If Half Rate is notavailable. |
| AT+WDR=1<br>Note: Configure data type FR, HR with HR preferred for outgoing calls (<in_coding_type> parameter is omitted) | OK<br>Note: Bearer is configured |
| AT+WDR=1<br>Note: Configure data type FRfor incoming calls (<out_coding_type> parameter is omitted) | OK<br>Note: Bearer is configured |
| AT+WDR=3<br>Note: Illegal value | +CME ERROR: 3<br>Note: Syntax error |
| AT+WVR?<br>Note: Ask for the current values | +WVR: 1,1<br>OK |

# Select Voice Gain +WSVG

**Description:** The product has 2 voice gain controllers. This **specific** command selects the microphone gain controller.

**Values:** **<n>** Controller
- **0** Controller 1 (Default)
- **1** Controller 2

**Syntax:** **Command syntax:** AT+WSVG = <n>

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

# Status Request +WSTR

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

**Values:** **<status>**
- **1** Initialization sequence
  **<value>**
  - **0** Not started
  - **1** On going
  - **2** Finished
- **2** Network status
  **<value>**
  - **0** No network
  - **1** Network available

**Syntax;** **Command syntax:** AT+WSTR=<status>
**Response syntax:** +WSTR: <status>,<value>

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

# Scan +WSCAN

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

**Values:** <**absolute frequency**> frequency in absolute format <rssi>

**0** -113 dBm or less
**1** -111 dBm
**2...30** -109 to -53 dBm
**31** -51dBm or greater
**99** not known or not detectable

**Syntax:** **Command syntax:** AT+WSCAN=<absolute frequency>
**Response syntax:** +WSCAN: <rssi>

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

# Ring Indicator Mode +WRIM

**Description:** This command sets or returns the state of the Ring Indicator Mode.

- In up-down RI mode, no pulses are sent before unsolicited AT response, and up-down signals are sent when receiving an incoming call.
- In pulse RI mode, an electrical pulse is sent on the Ring Indicator signal just before sending any unsolicited AT response in order not to lose 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.
- Pulse RI Mode + Pulse On Packet Downloaded: based on Pulse RI mode but an electrical pulse is also sent on the Ring Indicator signal just before sending a downloaded data packet (GPRS or CSD) if the remote client has dropped down his RTS signal.

**Values:** **<mode>**

**0** Up-down RI mode
**1** Pulse RI mode
**2** Pulse RI mode + Pulse on Downloaded Packet

**<n>** used only in mode RI Pulse + Pulse on Downloaded Packet (<mode>=2).

**0** Duration of pulse is 5 µs
**1-31** Duration of pulse is n x 30 µs
**Important:** Pulse duration may be increased by up to 3 ms, due to interrupt processes overhead.

**Note:** Remind that this mode corresponds to the case where the remote equipment has dropped its RTS signal to stop its flow control.

**Syntax:** **Command syntax:** AT+WRIM=<n>

| Command | Possible responses |
|---|---|
| AT+WRIM=0<br>Note: Select up-down RI mode | OK<br>Note: up-down RI mode selected |
| AT+WRIM=1<br>Note: Select pulse RI mode | OK<br>Note: pulse RI mode selected |
| AT+WRIM=2,0<br>Note: Select mode pulse RI on downloaded packet, pluse duration is 5 µs | OK<br>Note: mode pulse RI + Pulse on downloaded packet selected |
| AT+WRIM=?<br>Note: Ask the list of possible values | +WRIM: (0-2),(0-33)<br>OK<br>Note: possible values 0, 1 or 2 |
| AT+WRIM?<br>Note: Ask the current value | +WRIM: 1<br>OK<br>Note: current RI mode is pulse RI |

# 32kHz Power Down Mode +W32K

**Description:** This command allows the 32kHz power down mode to be enabled or disabled:

- When power down mode is entered, the product uses a 32kHz internal clock during inactivity stages (regardless 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.

**Values:** **<mode>**

**0** Disable 32kHz powerdown mode
**1** Enable 32kHz powerdown mode

**Syntax:** **Command syntax:** AT+W32K=<mode>

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

# Change Default Melody +WCDM

**Description:** This command allows a 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.

**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.

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

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

# Custom Character Set +WCCS

**Description:** This command allows you 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 you enter a string, it is converted into the GSM alphabet using the Custom To GSM table. In a similar way, when the user requests a string display, the string is converted from the GSM alphabet using the Custom alphabet and Custom alphabet extension tables.

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 equal the edition range requested; otherwise, the command will return "+CME ERROR: 24".

The default Custome alphabet extension table contains the following extended characters:

| ^ ε { } [ ] ~ \

**Values:**

**<mode>**

**0** Display the table

**1** Edit the table

**<table>**

**0** Custom to GSM conversion table (default table is PCCP437 to GSM table)

**1** Custom alphabet table (default table is GSM 7 bit default alphabet)

**2** Custom alphabet extension table (default table is GSM 7 bit default alphabet extended)

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

**0…127** for table 1 and 2

**0…255** for Custom to GSM conversion table

**Notes:**

- <char1> and <char2> are not ASCII codes; they stand for the range of a given character in the tables.
- If only <char 1> is provided, only this char is displayed/edited
- See Appendix C for informative examples of the use of these characters.

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

| Command | Possible responses |
|---|---|
| AT+WCCS=0,0,120,130<br>Note: Display from character 120 to character 130 of the Custom to GSM conversion table | +WCCS: 11,<br>78797A2020202020097E05<br>OK<br>Note: 11 characters displayed |
| AT+WCCS=1,0,115<CR><br>20<ctrl-Z><br>Note: Edit character 115 of the Custom to GSM conversion table | OK<br>Note: Edition successful |
| AT+WCCS=1,1,0,4<CR><br>40A324A5E8<ctrl-Z><br>Note: Edit the 5 first characters of the GSM to Custom conversion table | OK<br>Note: Edition successful |
| AT+WCCS=0,2,20<CR><br>Note: Display character 20 of the Custom alphabet extension table | +WCCS: 1,5E<br>OK |
| AT+WCCS=1,1,200<br>Note: Edit character 200 of GSM to Custom conversion table | +CME ERROR: 3<br>Note: Index out of range |

# Lock +WLCK

**Description:** This command allows the modem to be locked on a specific network operator.
**Note:** Test SIM cards (with MCC=001 & MNC=01) doesn't check these locks.

**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).

**<psswd>** password code, 8 digits

**<NetId>** IMSI for SIM lock (<fac>)="PS"), operator in numeric format (MCC and MNC) for other locks (other <fac> values).

**<GID1>** Group Identifier level 1, mandatory for Service provider lock (<fac>)="PP") and for Corporate lock (<fac>="PC").

**<GID2>** Group Identifier level 2, mandatory for Corporate lock (<fac>="PC").

**<CnlType>** Type of lock for co-operative 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 (co-operative 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*

**Syntax:**

**Command syntax:** AT+WLCK=<fac>,<passwd>,<NetId>[,<GID1>[,GID2]] [,<CnlType>[,<CnlData>]]

**Response syntax:** +WLCK: <status>

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

# CPHS Command +CPHS

**Description:** This 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 or if the SIM card does not support this CPHS feature.

**Values:**

**<mode>**

**0** Deactivate a CPHS feature
**1** Activate a CPHS feature
**2** Interrogate a CPHS status

**Note:** The deactivate or activate command has no effect on Alternate Line Service, Network Operator Name, CPHS Information, and Customer Profile Service features.

**<fctId>**

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

**<precision>** Used only if <mode>=2 and <fctId> = 5 to 7
if <fctId>=5, this field is <type format> (See +WNON)
if <fctId>=6, this field is <date field> (See +WCPI)
if <fctId>=7, this field is <service> (See +WCSP)

**<Status>**

**0** CPHS feature disabled
**1** CPHS feature enabled

**Syntax:** **Command syntax:** AT+CPHS=<Mode>,<FctId>[,<precision>]

| Command | Possible responses |
|---|---|
| AT+CPHS=<Mode>,<FctId> [,precision] | OK |
| AT+CPHS=<Mode>,<FctId> [,precision] | +CME ERROR: 3 |
| AT+CPHS? | +CPHS: <FctId1>,<Status><CR<LF><br>+CPHS: <FctId2>,<Status><CR<LF><br>…<br>+CPHS: <FctIdn>,<Status><CR<LF><br><br>OK |
| AT+CPHS=? | OK |

**Examples:**

```
AT+CPHS?                    Interrogate the status of CPHS functionality
    +CPHS: 1,0              Voice mail indicator functionality is deactivated
    +CPHS: 2,0              Mail box number functionality is deactivated
    +CPHS: 3,1              Alternate Line Serve functionality is activated
    +CPHS: 4,0              Divert Call Indicator  functionality is deactivated
    +CPHS: 5,1              Network Operator functionality is activated
    +CPHS: 6,1              CPHS Information functionality is activated
    +CPHS: 7,1              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
```

**Examples continued on next page**

```
AT+CPHS?                                    Interrogate the status of CPHS functionality
                +CPHS: 1,1                  Voice mail indicator functionality is activated
                +CPHS: 2,0                  Mail box number functionality is deactivated
                +CPHS: 3,1                  Alternate Line Serve functionality is activated
                +CPHS: 4,0                  Divert Call Indicator  functionality is deactivated
                +CPHS: 5,1                  Network Operator functionality is activated
                +CPHS: 6,1                  CPHS Information functionality is activated
                +CPHS: 7,1                  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 Divert Call Indicator functionality
                OK
****call forwarding is active on Line 1 *****
                +WDCI: 1,1

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
                OK

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

AT+WALS=1                                   Interrogate the status of activated Line
                +WALS:2                     Current line is number 2
                OK

AT+CPHS=0,4                                 Deactivate the Divet Call Indicator functionality
                OK


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

AT+CPHS=2,2                                 Query current mail box numbers in SIM
                +WMBN: 1,"19254871234",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
                OK                          Only Line1 can be updated
```

# Unsolicited Result: Voice Mail Indicator +WVMI

**Description:** This unsolicited indication gives the status of the LINE 1, LINE 2, or Data mailbox. The +CPHS command can be used to know the status of the voice mail indicator for each line.

**Values:**

**<LineId>**

- **1** Line 1
- **2** Line 2
- **3** Data

**<Status>**

- **0** No message waiting.
- **1** At least one message is waiting

**Syntax:**

**Command Syntax:** +WVMI=<LineId>,<Status>

**Response Syntax** to AT+CPHS=2,1:

WVMI: <LineId>,<Status>

| Command | Possible responses |
|---|---|
| AT+CPHS=1,1<br>Note: Activate Voice Mail Indicator feature | OK |
| AT+CPHS=2,1<br>Note: Get the current status of Voice Mail Indicator | +WVMI: 1,1 a message is waiting on Line 1<br>+WVMI: 2,1 a message is waiting on Line 2<br>+WVMI: 3,0 no data waiting |
| AT+CPHS=2,1 | +CME ERROR: 3<br>Note: CPHS feature is not allowed |
| AT+CPHS=1,1<br>Note: Activatation of Voice Mail Indicator feature | OK<br>Note: Voice Mail Indicator feature is activated |
| | +WVMI: 1,1<br>Note: A message is waiting on Line 1 |

# Unsolicited Result: Diverted Call Indicator +WDCI

**Description:** This unsolicited indication provides the call forwarding flags. The +CPHS command can be used to know the status of the Divert Call Indicator for each line.

**Values:**

**<LineId>**

- **1** Line 1
- **2** Line 2
- **3** Data

**<flag>, <status>**

- **0** Call forwarding is deactivated.
- **1** Call forwarding is activated.
  **Note**: Call forwarding SS is set by the AT+CCFC command.

**Syntax:**

**Command Syntax:** +WDCI: <LineId>,<Status>

**Response Syntax to AT+CPHS:** +WDCI: <LineId>,<flag>

| Command | Possible responses |
|---|---|
| AT+CPHS=1,4<br>Note: Activate Divert Call Indicator feature | OK |
| AT+CPHS=2,4<br>Note: Get the current status of Divert Call Indicator | +WDCI: 1,1 divert call indicator is active on Line 1<br>+WDCI: 2,1 divert call indicator is active on Line 2<br>+WDCI: 3,0 divert call indicator is deactived on data |
| AT+CPHS=2,4 | +CME ERROR: 3<br>Note: CPHS feature is not allowed |
| AT+CPHS=1,4<br>Note: Activatation of Divert Call Indicator feature | OK<br>Note: Divert Call Indicator feature is activated |
| | +WDCI: 1,1<br>Note: Call forwarding is active on Line 1 |

# Network Operator Name +WNON

**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.

**Values:** **<type format>**

**0** Long format operator name

**1** Short format operator name. Default.

**<operator name>** The name of the operator in long or short format

**Syntax:** **Command Syntax:** AT+CHPS=2,5[,<type format>]
**Response Syntax:** +WNON: <type format>,<operator name>

| Command | Possible responses |
|---|---|
| AT+CPHS=2,5<br>Note: Get Operator Name | +WNON: 0,"Orange F"<br>OK |
| AT+CPHS=2,5,1<br>Note: Get short format Operator Name | +WNON: 1,"Orange"<br>OK |
| AT+CPHS=2,5,0 | +CME ERROR: 3<br>Note: CPHS feature is not allowed or format name is not accessible |
| AT+CPHS=2,5,1 | +CME ERROR: 3<br>Note: CPHS feature is not allowed or format name is not accessible |
| AT+CPHS=0,5<br>Note: Deactivatation of Network Operator Name feature | OK<br>Note: No effect |

# CPHS Information +WCPI

**Description:** This indication provides CPHS information; i.e., which data fields are present in the SIM. This command is the response to the AT+CPHS 2,6 [,<data field>] command.

**Values:** **<data field>** value indicating the field of CPHS information

If **<precision>** field is omitted in the AT+CPHS command, all fields of CPHS Information will be displayed.

**<status>**

**0** data field is set

**1** data field is unset

When all CPHS Information is requested, the status corresponds to a bit field. See Codes and Values in the Appendix.

**Note:** The field CSP Service (<data field> = 1) is used to set the CSP feature at initialization.

**Syntax:** **Command Syntax**:AT+CHPS=2,6[,<data field>]
**Response Syntax:** +WCPI: <data field>,<status>

| Command | Possible responses |
|---|---|
| AT+CPHS=2,6<br>Note: Get current status for all CPHS Information fields | +WCPI: 0,"0033000F"<br>OK |
| AT+CPHS=2,6,13<br>Note: Get the current status of Call Forward Activated Indicator for Line 1 | +WCPI: 13,1<br>OK<br>Note: Call Forward is active for Line 1 |
| AT+CPHS=2,6,22<br>Note: Get current status for Line 2 Mailbox Number | +WCPI: 22,0<br>OK<br>Note: Mailbox Number for Line 2 is not available |
| AT+CPHS=2,6,17 | +CME ERROR: 3<br>Note: Wrong data field |
| AT+CPHS=2,6,22<br>Note: Get current status for Line 2 Mailbox Number | +CME ERROR: 3<br>Note: CPHS feature is not allowed |
| AT+CPHS=0,6<br>Note: Deactivatation of CPHS Information feature | OK<br>Note: No effect |

# Customer Service Profile +WCSP

**Description:** This indication tells whether or not a service is accessible to the customer. This command is the response to the AT+CPHS 2,7,<service>] command.

**Values:** **<service>** value indicating the CSP field to display (See Codes and Values in the Appendix).

**<status>**

**0** service is not customer-accessible

**1** service is customer-accessible

**Note:** The field Alternate Line Service (CPHS Teleservices Group) sets the ALS feature at initialization.

**Syntax:** **Command Syntax:** AT+CHPS=2,7,<service>
**Response Syntax:** +WCSP: <service>,<status>

| Command | Possible responses |
|---|---|
| AT+WCSP=? | ERROR |
| AT+WCSP? | ERROR |
| AT+CPHS=2,7 | +CME ERROR: 3<br>Note: Syntax error |
| AT+CPHS=2,7,9<br>Note: Get current status of Barring All Outgoing Calls | +WCSP: 9,1<br>OK<br>Note: Barring or All Outgoing Calls is customer accessible |
| AT+CPHS=2,7,11<br>Note: Get current status of Barring All Outgoing International Calls | +WCSP: 11,1<br>OK<br>Note: Barring or All International Outgoing Calls is customer accessible |
| AT+CPHS=2,7,2<br>Note: Get current status of Call Forwarding on User Busy | +CME ERROR: 3<br>Note: CPHS feature is not allowed |
| AT+CPHS=0,7<br>Note: Deactivatation of CPHS Information | OK<br>Note: No effect |

# Customer Storage Mirror +WMIR

**Description:** This command allow you to make a mirror copy of the current configuration parameters in the EEPROM. In the case of a memory problem for the storage: if a customer mirror already exists, this one will be restored. Otherwise, the default mirrored parameters are restored.

**Warning:** This command should be used only on special advice from a Technical Support person.

**Values:** No parameters

**Syntax:** **Command syntax:** AT+WMIR

| Command | Possible responses |
|---|---|
| AT+WMIR=? | OK |
| AT+WMIR<br>Note: Build the Customer Mirror | OK |

# Change Default Player +WCDP

**Description:** This command allows the default melody player to be selected.

**Values:** **<player>**

**0** Buzzer

**1** Speaker

**Syntax:** **Command syntax:** AT+WCDP = <player>

| Command | Possible responses |
|---|---|
| AT+WCDP=? | +WCDP: (0-1)<br>OK |
| AT+WCDP=0<br>Note: Select the buzzer | OK |
| AT+WCDP? | +WCDP: 0<br>OK |

# CPHS Mail Box Number +WMBN

**Description:** This command sets the different mailbox numbers in SIM. The +CPHS command can be used to know which mailbox numbers can be updated.

**Values:**

**<LineId>**
- **1** Line 1
- **2** Line 2
- **3** Data

**<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 G - 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 affects 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

**Syntax:**

**Command syntax:** AT+WMBN = <LineId>,<number>,<type>,<name>

**Response syntax to AT+CPHS=2,2:** +WMBN = <LineId>,<number>,<type>,<name>,<status>

| Command | Possible responses |
|---|---|
| AT+WMBN=? | OK |
| AT+WMBN? | OK |
| AT+CPHS=2,2<br>Note: Get the current Mail Box Numbers in SIM | +WMBN: 1,"0123456789",129,”Maison” , 1<br>+WMBN: 2,”9876543210”,129,”Travail” , 1<br>+WMBN: 3,,,,1<br>+WMBN: 4,,,,1<br>OK |
| AT+WMBN=1,”+33122334455”,145<br>Note: Set mailbox number for line. | OK<br>Note: Mailbox number for Line 1 is set. |
| AT+WMBN=2<br>Note: Erase mailbox number & name for line 2 | OK |
| AT+CPHS=2,2<br>Note: Get current Mail Box Numbers again | +WMBN: 1,"+ 33122334455",145,1<br>+WMBN: 2,,,,1<br>+WMBN: 3,,,,1<br>+WMBN: 4,,,,1<br>OK |

# Alternate Line Service +WALS

**Description:** This command allows you to set and to get the active line. The CPHS command can be used to know which line is active.

**Values:** **<CmdType>**

**0** Set active line
**1** Get active line

**<LineId>** Used only for <CmdType>

**1** Line 1
**2** Line 2

**Syntax:** **Command syntax:** AT+WALS = <CmdType>[,<LineId>]
**Response syntax to AT+CPHS=2,3:** +WALS = <LineId>

| Command | Possible responses |
|---|---|
| AT+WALS? | +WALS: 1<br>OK<br>Note: Display current active line |
| AT+WALS=? | +WALS: (0-1),(1-2)<br>OK |
| AT+WALS = 0,1<br>Note: Activate Line 1 | +WALS: 1<br>OK |
| AT+WALS = 0,2<br>Note: Activate Line 2 | +CME ERROR: 3<br>Note: When the ALS feature is not allowed |
| AT+WALS = 1<br>Note: Get the current Active Line | +WALS: 1<br>Note: Display the current Active Line |
| AT+WALS = 1,2 | +CME ERROR: 3<br>Note: Syntax error |
| AT+CPHS=0,3<br>Note: Deactivation of ALS feature | OK<br>Note: No effect |
| AT+CPHS=2,3<br>Note: Interrogate ALS feature | +WALS: 1<br>Note: Display the current Active Line<br>+CME ERROR: 3<br>Note: In the case where the ALS feature is not allowed |

# Wavecom Open AT Control Command +WOPEN

**Description:** This command starts, stops, deletes, and gets information about the current Open AT® embedded application.

This command also allows you to erase the Open AT® flash objects storage place and to configure the Application and Data (A&D) storage place size.

**Values:**

**<Mode>**

- **0** Stop the Open AT embedded application. If this one was running, the product resets
- **1** Start the Open AT embedded application. If this one was stopped, the product resets
- **2** Get the Open AT library versions
- **3** Erase the objects flash of Open AT embedded application
- **4** Erase the Open AT embedded application
- **5** Suspend (in Wavecom software kernel) the Open AT embedded application tasks
- **6** If the (A&Dsize) parameter is used, configure the Application & Data storage size. Otherwise, display the current A&D storage place size and Open AT application space size. If the A&D storage place size has changed, the product resets.

  **Notes:**
  - For Mode=1: If the main version numbers returned by the AT+WOPEN=2 command do not match, the command will reply +CME ERROR: 541.
  - Mode=3 and 4 are only available only if the Open AT embedded application is stopped (AT+WOPEN=0).
  - Open AT embedded applications can be resumed with the AT+OPENRES command or INTERRUPT feature (see +WCFM).
  - Warning: With Mode 6, any A&D size change will lead to this area format process (this process will take some seconds on start-up , before the +WIND:3 indication display (up to 1.5 seconds per 64 Kbytes flash sector size can be considered as a maximum; all A&D cells data will be erased).

**<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.

**<A&DSize>** Usable only with <mode>=6

**[0 -1344]** Kbytes size allocated for the Application & Data storage place. Default = 768 Kbytes.

Provided parameter value will be updated with the nearest flash sector subdivision (64 Kbytes). For example, if a 100 Kbytes size is required, a 128 Kbytes size will effectively be set.

**<OATSize>** Returned with <mode>=6

Open AT Application reserved size (in Kbytes). This size is deducted from the <A&Dsize> one, since the whole available size for Open AT and A&D storage places are 1600 Kbytes (<OATSize> + <A&Dsize> = 1600).

**Syntax:**

**Command syntax:** AT+WOPEN=<Mode>[,<A&Dsize>]

**Response syntax according to mode:** +WOPEN: <Mode>[,<IntVersion>[<ExtVersion>]]

**or**

+WOPEN: <Mode>,<A&DSize>,<OATSize>]

| Command | Possible responses |
|---|---|
| AT+WOPEN=? | +WOPEN: (0-6),(0-1344)<br>OK |
| AT+WOPEN? | +WOPEN: 0<br>OK |
| AT+WOPEN=2<br>Note: Get the Open AT library versions | +WOPEN: 2, “AT v3.01”, “AT v2.10”<br>OK<br>Note: Open AT v2.10 library version. An embedded application has been downloaded on this product |
| AT+WOPEN=1 | +CME ERROR: 541<br>Note: Since main versions do not match, the Open AT Application cannot be started |
| AT+WOPEN=2<br>Note: Get the Open AT library versions | +WOPEN: 2, “AT v2.00”,”AT v2.00”<br>OK<br>Note: Open AT v2.00 library version. An embedded application has been downloaded on this product. |

| | |
|---|---|
| AT+WOPEN=3 | OK<br>Note: The objects flash are erased |
| AT+WOPEN=1<br>Note: Start the embedded application | OK<br>+WIND: 3<br>Note: Product reset in order to start the embedded application |
| AT+WOPEN=3 | +CME ERROR: 532<br>Note: The embedded application is activated so the objects flash are not erased |
| AT+WOPEN=4 | +CME ERROR: 532<br>Note: The embedded application is activated so it cannot be erased |
| AT+WOPEN=0<br>Note: Stop the embedded application | OK<br>+WIND: 3<br>Note: Product reset in order to stop the embedded application |
| AT+WOPEN=3 | OK<br>Note: The objects flash are erased. |
| AT+WOPEN=4 | OK<br>Note: The embedded application is erased |
| AT+WOPEN=6 | +WOPEN: 6,768,832<br>OK<br>Note: 768 Kbytes are reserved for A&D storage place, and 832 for the Open AT Application |
| AT+WOPEN=6,1280 | +CME ERROR: 550<br>Note: The current Open AT Application size is too big to allow this new A&D storage place size |
| AT+WOPEN=6,768 | +WOPEN: 6,768,832<br>OK<br>Note: No product reset (same size used) |
| AT+WOPEN=6,900 | +WOPEN: 6,960,640<br>OK<br>+WIND: 3<br>Note: Size updated according to the nearest flash sector sub-division; product reset in order to set the new A&D storage place size. |
| AT+WOPEN=6 | +WOPEN: 6,960,640<br>OK<br>Note: 960 Kbytes are served for the A&D storage place, and 640 for the Open AT application |
| AT+WOPEN=5 | +CME ERROR: 3<br>Note: The Open AT Application is not running |
| AT+WOPEN=1<br>Note: Start the embedded application | OK<br>+WIND: 3<br>Note: Product reset in order to start the embedded application |
| +WOPEN=5<br>Note: Suspend Open AT tasks | OK |
| AT+WOPEN? | +WOPEN:5<br>OK |

# Reset +WRST

**Description:** This command resets the modem after the time specified by the <delay> parameter.

**Values:** **<val1>**
- **0** timer reset is disabled
- **1** timer reset is enabled

**<Delay>** specify the time for reset
Range “000:00”- “168:59” (format hhh:mm)

**<RemainTime>** time before next reset
Range “000:01”- “168:59” (format hhh:mm)

**Syntax:** **Command syntax:** AT+WRST =<Mode>,<Delay>
**Response syntax:** +WRST: <Mode>,<Delay>,<RemainTime>

| Command | Possible responses |
|---|---|
| AT+WRST=? | OK |
| AT+WRST=0<br>Note: Disable timer | OK |
| AT+WRST=1,”001:03”<br>Note: Enable timer and put delay at 1 hour 3 minutes | OK |
| AT+WRST? | +WRST: 1,”001:03”,”001:01”<br>OK<br>Note: Timer activated to reset after 1 hour and 3 minutes. At this point, 1 hour and 1 minute remain before next reset. |

# Set Standard Tone +WSST

**Description:** This command sets and gets the sound level of the Standard Tones.

**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

**Syntax:** **Command syntax:** AT+WSST=[<sound level>][,<ring tone level>]

| Command | Possible responses |
|---|---|
| AT+WSST=0<br>Note: Set volume to Maximum | OK |
| AT+WSST=15<br>Note: Set volume to Minimum | OK |
| AT+WSST=,5<br>Note: Set ring tone level to 5 | OK |
| AT+WSST?<br>Note: get current standard tones sound level | +WSST: 15,5<br>OK<br>Note: current standard tones level is 15 (minimum), and ring tone level is 5. |
| AT+WSST=?<br>Note: supported parameters | +WSST: (0-15),(0-15)<br>OK |

# Hang-up +WATH

**Description:** This command disconnects 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).

**Values:**

**<RelCause>:**

decimal value from 1 to 127
See table "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

**Note:** In order to have a "Normal Release", use the ATH command.

**Syntax:** **Command Syntax:** AT+WATH=<RelCause>,<location>

| Command | Possible responses |
|---|---|
| AT+WATH=31<br>Note: Ask for disconnection with release cause=normal and location=USER | OK<br>Note: All calls, if any, are released |
| AT+WATH=? | +WATH: (1-127),(0-5,7,10) |
| AT+WATH=17,2<br>Note: Ask for disconnection with release cause=user busy and location= public network serving the local user | OK<br>Note: All calls, if any, are released |

# Multi-Band Selection +WMBS

**Description:** Use this command to select the GSM bands on which the modem will work. This command is allowed only if the selected bands are supported.

You can choose whether the change is immediate or not:

- Either the modem has to be reset to take this change into account (this is the default)
- or the GSM stack restarts immediately on the specified band(s). In this mode, the command +WMBS is forbidden during the initialization phase of the modem and during calls.

**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 900E (extended) /1800 MHz
- **6** dual-band mode 900E (extended) /1900 MHz

**<Param>** indicates the type of change

- **0** the modem will have to be reset in order to start on the specified band(s). <ResetFlag> is set to 1.
- **1** the change is effective immediately. The GSM stack is restarted with the specified band(s). <ResetFlag> stays at 0. This mode is forbidden whil in communication and during modem initialization.

**Note:** If <Param> is not given, the modem has to be reset to start on the specified band(s), as for <param>=0.

**<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. This is the case when the band was changed with "AT+WMBS=<band>" or "AT+WMBS=<band>,0"

**Syntax:**

**Command Syntax:** AT+WMBS=<Band>[,<param>]

**Response Syntax:** +WMBS: <Band>,<ResetFlag>

| Command | Possible responses |
|---|---|
| AT+WMBS=<Band> | OK<br>Note: The modem has to reset for the change to be effective |
| AT+WMBS=<Band>,0 | OK<br>Note: The modem has to reset for the change to be effective |
| AT+WMBS=<Band>,1 | OK<br>Note: Band mode selected and GSM stack restarted |
| AT+WMBS=<Band> | +CME ERROR: 3<br>Note: Band not allowed |
| AT+WMBS? | +WMBS:<Band>,<ResetFlag><br>OK<br>Note: Current selected band mode is returned. |
| AT+WMBS=? | WMBS: (0,3,4),(0-1)<br>OK<br>Note: Only 850 mono-band or 850/1900 bi-band are available |
| AT+WMBS=? | WMBS: (01,2,3,4,5,6),(0-1)<br>OK<br>Note: All bands are available |

# Chapter 14 – SIM Toolkit

## Overview of SIM Application Toolkit

SIM Toolkit, also known as "SIM Application Toolkit," introduces new 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.

### Functionality

The term *SIM Toolkit* refers to the functionalities described in the GSM Technical Specification 11.14. It introduces about twenty-five new commands for the SIM. Three classes of Toolkt functionalities have been defined, with Class 1 offering a subset of commands and Class 3 offering the full range of commands *(See the Support of SIM Toolkit Classes table in APPENDIX D)*.

The SIM Application Toolkt supports:

- profile download
- proactive SIM
- data download into SIM
- menu selection
- call control by SIM

### 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 the customer application supports. The AT command used for this operation is **+STSF** *(SIM Toolkit Set Facilities)*.

### 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)***.**

### Data Download to SIM

Data downloading to the SIM allows *(SMS, phonebook…)* 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.

### Menu Selection

A set of menu items is supplied by the SIM Application Toolkit. The menu selection command can then be used to inform the SIM Application which menu item is selected.

The commands used for this operation are **+STIN, +STGI and +STGR**.

### Call Control by SIM

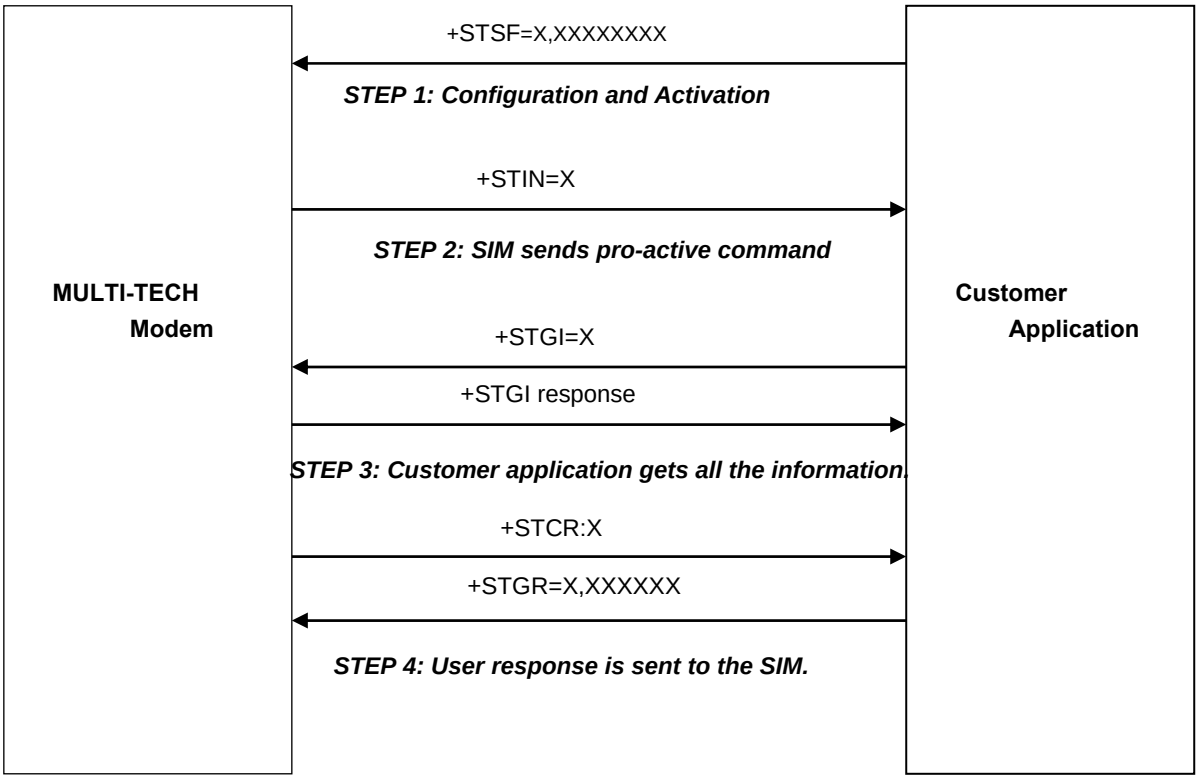
The call control mechanism allows the SIM to check all dialed numbers, supplementary service control strings and USSD strings before connecting to the network. This gives the SIM the ability to allow, bar or modify the string before the operation starts.

The commands used for this operation are:

**+STCR** *(SIM Toolkit Control Response)*
**+STGR** *(SIM Toolkit Give Response)*

# Messages Exchanged During a SIM Toolkit Operation

The following scheme shows the SIM Toolkit commands and unsolicited results that are exchanged.




**Step 1:**
The customer application informs the modem which facilities are supported. This operation is performed with the **+STSF** *(SIM Toolkit Set Facilities)* command, which also activates or deactivates the SIM Toolkit functionality.

**Step 2:**
An unsolicited result **+STIN** *(SIM Toolkit indication)* is sent by the product in order to indicate to the customer application which command type the SIM Application Toolkit is running. The last SIM Toolkit indication can be requested by the **+STIN?** command.

**Step 3:**
The customer application uses the **+STGI** *(SIM Toolkit Get Information)* command to get all the information about the SIM Toolkit command, given by **+STIN**.

**Step 4:**
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.

# SIM Toolkit Commands

## SIM Toolkit Set Facilities +STSF

**Description:** This command allows SIM Toolkit facilities to be activated, deactivated or configured.

**Values:**

**<mode>**

**0** Deactivates the SIM Toolkit functionalities.
**1** Activates the SIM Toolkit functionalities.
**2** Configures the SIM Toolkit functionalities.

**<Config>**

**(160060C01F – 5FFFFFFF7F)** *(hex format)*
**Default:** 1F6BFFFF1F

**<Timeout>**

**1-255** Timeout for user responses (multiple of 10 seconds).
**Default:** 3

**<Autoresponse>**

**0** Automatic response is not activated
**1** Automatic response is activated
**Default:** 1

**Notes about Values:**

- The activation or deactivation of the SIM Toolkit functionalities requires the use of the +CFUN *(Set phone functionality)* command to reset the product (this operation is not necessary if PIN is not entered yet).
- The <Config> parameter gives the coding of the TERMINAL PROFILE, precisely the list of SIM Application Toolkit facilities that are supported by the customer application.
- The <Timeout> parameter (multiple of 10 seconds) sets the maximum time the user has for reacting (to select an item, to input a text, etc).
- When the <Autoresponse> is activated, the +STIN indication for Play Tone (5), Refresh (7), Send SS (8), Send SMS (9) or Send USSD (10) is automatically followed by the corresponding +STGI response.

**Note about Bits:**

Some bits are related to the product only and not to the customer application. The product automatically sets these bits to either 0 or 1 whatever the user enters with the +STSF command. Those values are given in Appendix D.

Each facility is coded on 1 bit:

- bit = 1: facility is supported by the customer application.
- bit = 0: facility is not supported by the customer application.

Only the first five bytes of the TERMINAL PROFILE (Class 2) can be configured. The other are set to 0. *(See structure of TERMINAL PROFILE in APPENDIX E.)*

**Syntax:** **Command syntax:** +STSF=<mode>[,<config>][,<Timeout>][,<AutoResponse>]

| Command | Possible responses |
|---|---|
| AT+STSF=<Mode>[,<Config>] [,<Timeout>][,<AutoResponse>] | OK<br>+CME ERROR: <err> |
| AT+STSF? | +STSF: <Mode>,<Config>,<Timeout>,<Autoresponse> |
| AT+STSF=? | +STSF: (0-2), (160060C01F - 5FFFFFFF7F),(1-255),(0-1)<br>OK |

### SIM Toolkit Facilities Error Codes

+CME ERROR: 3 **Operation not allowed**.
This error is returned when a wrong parameter is entered.

## Example

| | | |
|---|---|---|
| AT+CMEE=1 | | *Enable the reporting of mobile equipment errors* |
| | OK | |
| AT+WIND=15 | | *Set indications* |
| | OK | |
| AT+CPAS | | *Query ME Status* |
| | +CPAS: 0 | *ME is ready.* |
| | OK | |
| AT+STSF=? | | *Test command SIM Toolkit Set Facilities* |
| | +STSF: (0-2), (160060C01F – 5FFFFFFF7F),(1-255) | |
| | OK | |
| AT+STSF? | | |
| | +STSF: 0,”160060C000”,3 | *No activation of SIM Toolkit functionality* |
| | OK | |
| AT+STSF=2,”5FFFFFFF7F” | | *Set all SIM Toolkit facilities (class 3).* |
| | OK | |
| AT+STSF=3 | | *Syntax Error* |
| | +CME ERROR: 3 | |
| AT+STSF=1 | | *Activation of SIM Toolkit functionality* |
| | OK | |
| AT+CFUN=1 | | *Reboot Software.* |
| | OK | |
| AT+CPIN? | | *Is the ME requiring a password?* |
| | +CPIN: SIM PIN | *Yes, SIM PIN required* |
| AT+CPIN=0000 | | |
| | OK | *PIN OK* |
| | +WIND: 4 | *Init phase is complete* |
| AT+STSF? | | |
| | +STSF: 1,”5FFFFFFF7F”,3 | *SIM Toolkit functionality activated with all facilities* |
| | OK | |

# SIM Toolkit Indication +STIN or +STRIL

**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:** AT+STIN: <CmdType>

| **Option:** | **<CmdType>** |
|---|---|
| **0** | Indicates that a 'Setup Menu' pro-active command has been sent from the SIM. |
| **1** | Indicates that a 'Display Text' pro-active command has been sent from the SIM. |
| **2** | Indicates that a 'Get Inkey' pro-active command has been sent from the SIM. |
| **3** | Indicates that a 'Get Input' pro-active command has been sent from the SIM. |
| **4** | Indicates that a 'Setup Call' pro-active command has been sent from the SIM. |
| **5** | Indicates that a 'Play Tone' pro-active command has been sent from the SIM. (*) |
| **6** | Indicates that a 'Sel Item' pro-active command has been sent from the SIM. |
| **7** | Indicates that a 'Refresh' pro-active command has been sent from the SIM. (*) |
| **8** | Indicates that a 'Send SS' pro-active command has been sent from the SIM. (*) |
| **9** | Indicates that a 'Send SMS' pro-active command has been sent from the SIM. (*) |
| **10** | Indicates that a 'Send USSD' pro-active command has been sent from the SIM. (*) |
| **11** | Indicates that a 'SETUP EVENT LIST' pro-active command has been sent from the SIM. |
| **93** | An "SMS-PP Download" failed due to SIM BUSY |
| **94** | An "SMS-PP Download" failed due to SIM ERROR |
| **98** | Indicates the timeout when no response from user. |
| **99** | Indicates that 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.

**Second SIM Toolkit Indication**

If the customer application needs to exchange a SIM Toolkit message directly with the SIM card, the second indication (+STRIL) gives the full command string provided by the SIM.

**Values:** <CmdTreated>

**0** The command must be treated by the application

**1** The is already treated by the modem

<Command string> string type: SIM command string in hexadecimal format.

**Syntax:** +STRIL: <CmdTreated>,<Command string>

**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, *Messages exchanged during a SIM Toolkit operation*) and the response of the user with the +STGI command (Step 3).

**Syntax:** Command syntax: AT+STIN?

| Command | Possible responses |
|---|---|
| AT+STIN?<br>Note: Ask for the last SIM Toolkit indication sent by the SIM | <br>+STIN: 0<br>OK<br>Note: the last SIM Toolkit indication was a Setup Menu |
| AT+STGI=0 | Note: Display the SIM Toolkit application menu |
| AT+STIN?<br>Note: Ask for the last SIM Toolkit indication sent by the SIM | +CME ERROR: 4<br>Note: Operation not supported. The +STGI command has been already used |

# SIM Toolkit Get Information +STGI

**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)***.

**Values:** Values are listed after the Command Table

**Syntax :** **Command syntax:** +STGI=<CmdType>

| Command | Possible responses |
|---|---|
| AT+STGI=<CmdType> | +CME ERROR: <err> |
| AT+STGI=? | +STGI: (0-11)<br>OK |

**Table of Command Types**

| Cmd Type | Description | Possible responses |
|---|---|---|
| 0 | Get information about **Setup Menu** pro-active command. | +STGI: <Alpha Identifier menu><br>+STGI: <Id1>,<NbItems>,<Alpha Id1 Label>,<Help Info>[,<NextActionId>]<CR><LF><br>+STGI: <Id2>,<NbItems>,<Alpha Id2 Label>,<Help Info>[,<NextActionId>]<CR><LF><br>[…]]<br>**No action expected from SIM.** |
| 1 | Get information about **Display text** pro-active command. | +STGI: <Prior>,<Text>,<ClearMode><br>**No action expected from SIM.** |
| 2 | Get information about **Get Inkey** pro-active command. | +STGI: <Format>,<HelpInfo>[,<TextInfo>]<br>**SIM expects key pressed (+STGR).** |
| 3 | Get information about **Get Input** pro-active command. | +STGI: <Format>,<EchoMode>,<SizeMin>,<SizeMax>, <HelpInfo>[,<TextInfo>]<br>**SIM expects key input (+STGR).** |
| 4 | Get information about **Setupt call** pro-active command. | +STGI: <Type>,<CalledNb>,<SubAddress>,<Class><br>**SIM expects user authorization (+STGR).** |
| 5 | Get information about **Play Tone** pro-active command. | +STGI: <ToneType>[,<TimeUnit>,<TimeInterval>,<TextInfo>]<br>**No action.** |
| 6 | Get information about **Sel Item** pro-active command. | +STGI: <DefaultItem>, <Alpha Identifier menu><CR><LF><br>+STGI: <Id1>,<NbItems>,<Alpha Id1 Label>,<Help Info>[,<NextActionId>]<CR><LF><br>+STGI: <Id2>,<NbItems>,<Alpha Id2 Label>,<Help Info>[,<NextActionId>]<CR><LF><br>[…]]<br>**SIM expects an item choice (+STGR).** |
| 7 | Get information about **Refresh** pro-active command. | +STGI: <RefreshType><br>**No action (Refresh done automatically by product).** |
| 8 | Get information about **Send SS** pro-active command. | +STGI:<TextInfo><br>**No action (Send SS done automatically by product).** |
| 9 | Get information about **Send SMS** pro-active command. | +STGI: <TextInfo><br>**No action (Send SMS done automatically by product).** |
| 10 | Get information about **Send USSD** pro-active command. | +STGI: <TextInfo><br>**No action (Send USSD done automatically by product).** |
| 11 | Get information about **SETUP EVENT LIST** pro-active command. | +STGI: <Evt> |

**Values for the SIM Toolkit Get Information Command**:

**Values when CmdType=0 (Setup menu)**

**<Alpha Idenitifer menu>** Alpha identifier of the main 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 F)*

*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 |
| **<EchMode>** | |
| **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 |
| **<SubAdress>** | Called party sub-address in ASCII format |
| **<Class>** | |
| **0** | Voice call |
| **1** | Data call |
| **<Alpha Id>** | |

**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 Idenitifer 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 F)* |

**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 |

**Note:** 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".

**Error Codes for the SIM Toolkit Get Information Command:**

| | |
|---|---|
| + 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 pro-active 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. |

**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 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
```

# Unsolicited Result: SIM Toolkit Control Response +STCR

**Description:** 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.

**Values:**

**<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.

**Syntax:** **Command Syntax:** +STCR: <Result>[,<Number>,<MODestAddr>,<TextInfo>]

# SIM Toolkit Give Response +STGR

**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.

**Values:** The values are listed after the Command Syntax Table.

**Syntax:** **Command syntax:** +STGR=<CmdType>[,<Result>,<Data>]

| Command | Possible responses |
|---|---|
| AT+STGR=<CmdType>[,<Result>,<Data | OK<br>+CME ERROR: <err> |
| For GetInput with <Result>=1:<br>AT+STGR=3,1<CR><br><Data><Ctrl Z> | OK<br>+CME ERROR: <err> |
| For GetInkey with <Result>=1<br>AT+STGR=2,1,"<Data>" | OK<br>+CME ERROR: <err> |
| AT+STGR=? | OK |

**Values:**

**<CmdType>**
- **0** Item selection in the main menu.
- **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 0x00 0x41 0x00 0x42 with UCS2 DCS. (See the Appendix G 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, of *Messages exchanged during a SIM Toolkit operation*), 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=0** request. 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 D, Table 2. If a Terminal Response is attempted during a incompatible Proactive Command session, a **+CME ERROR: 3** will be returned.

**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.

**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
```

# Chapter 15 – GPRS commands

**Important:** GPRS commands are not available under GSM-only software.

## Define PDP Context +CGDCONT

**Description:** This command specifies PDP context parameter values for a PDP context identified by the local context identification parameter, <cid>.

Four PDP contexts can be defined through the software.

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 modem 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 modem supports several PDP types, <PDP_type), the parameter value ranges for each <PDP_type> are returned on a separate line.

**Values:**

**<cid>** (PDP Context Identifier) a numeric parameter (1-4) which specifies a particular PDP context definition. The parameter is local to the DTE-modem interface and is used in other PDP context-related commands.

**<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 modem in the address space applicable to the PDP.

If the value is null or omitted, then a value may be provided by the DTE during the PDP startup procedure or a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the **+CGPADDR** command.

**<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 (V.42bis) provided in SNDCP is V.42bis.
- Four CIDs are available to specify four PDP contexts, but only 11 NSAPIs are available for PDP activation. Only one can be activated at a time.

**Syntax:** Command Syntax: AT+CGDCONT

| Command | Possible responses |
|---|---|
| AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp>]]]]]] | OK<br>ERROR |
| AT+CGDCONT? | +CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp><br>[<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp><br>[...]]<br>OK |
| AT+CGDCONT=? | +CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)<br>[<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)<br>[...]]<br>OK |
| AT+CGDCONT: 1, “IP” “internet”;<br>AT+CGCONT=2, “IP”, “abc.com” | OK |
| AT+CGDCONT=? | +CGCONT: (1-4), “IP”,,,(0-1),(0-1)<br>+CGCONT: (1-4), “PPP”,,,0,0,0<br>OK |
| AT+CGCONT? | +CGCONT: 1, “IP”,”internet”,,0,0<br>+CGCONT: 2, “IP”,”abc.com”,,0,0<br>OK |

# Quality of Service Profile Requested +CGQREQ

**Description:** This command allows the DTE to specify a Quality of Service Profile that is used when the modem 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 modem supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

**Values:**

**<cid>** Numeric parameter that specifies a particular PDP context definition
Range 1- 3

**<precedence>** Numeric parameter that 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 & 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 that 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) |
| 0 | Subscribed | Subscribed by the Nwk / default if value is omitted | | |
| 1. (Predictive) | < 0.5 | | < 2 | < 7 |
| 2. (Predictive) | < 5 | < 25 | < 15 | < 75 |
| 3. (Predictive) | < 50 | < 250 | < 75 | < 375 |
| 4. (Best Effort) | Unspecified | | | |

**<reliabiliy>**

**0** Subscribed
**1** Up to 1 000 (8 kbit/s)
**2** Up to 2 000 (16 kbit/s)
**3** Up to 4 000 (32kbit/s)
**4** Up to 8 000 (64 kbit/s)
**5** Up to 16 000 (188 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, & 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>**

**0** Subscribed
**1** Up to 1 000 (8 kbit/s)
**2** Up to 2 000 (16 kbit/s)
**3** Up to 4 000 (32kbit/s)
**4** Up to 8 000 (64 kbit/s)
**5** Up to 16 000 (188 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>**

**0** Subscribed by the Network by 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

**Syntax: Command Syntax:**

| Command | Possible Response(s) |
|---|---|
| AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]] | OK<br>ERROR |
| AT+CGQREQ? | +CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean><br>[<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean><br>[…]]<br>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)<br>[<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)<br>[…]]<br>OK |
| AT +CGQREQ=1,1,4,5,2,14 | OK |
| AT+CGQREQ=? | +CGQREG: “IP”, (1-3), (1-4), (1-5), (1-9), (1-31)<br>+CGQREQ: “PPP”, (1-3), (1-4), (1-5), (1-9), (1-31)<br>OK |
| AT+CGQREQ? | +CGQREQ: 1,1,4,5,2,14<br>OK |

# Quality of Service Profile Minimum Acceptable +CGQMIN

**Description:** This command allows the DTE to specify a minimum acceptable profile which is checked by the modem 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 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, +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 settings1 for each defined context.

The test command returns values supported as a compound value. If the modem supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

**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.
**Note:** If a value is omitted for a particular class then this class is not checked.

**Syntax:** Command Syntax: AT+CGQMIN

| Command | Possible Response(s) |
|---|---|
| AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]] | OK<br>ERROR |
| AT+CGQMIN? | +CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean><br>[<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean><br>[…]]<br>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)<br>[<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)<br>[…]]<br>OK |
| AT+CGQMIN=1,1,4,5,2,31 | OK |
| AT+CGQMIN=? | +CGQMIN: “IP”,(1-3),(1-4),(1-5),(1-9),(1-31)<br>+CGQMIN: “PPP”,(1-3),(1-4),(1-5),(1-9),(1-31)<br>OK |
| AT+CGQMIN? | +CGQMIN=? 1,1,4,5,2,14<br>OK |

# GPRS Attach or Detach +CGATT

**Description:** The execution command is used to attach the modem to, or detach the modem from, the GPRS service. After the command has completed, the modem remains in V.25ter command state. If the modem is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, 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.

**Values:** **<state>** Indicates the state of GPRS attachment

**0** Detached
**1** Attached
**2** Combined detach (GPRS and GSM detach in the same network request)

Other values are reserved and will result in an ERROR response to the execution command.

**Syntax:** Command Syntax: AT+CGATT

| Command | Possible Responses |
|---|---|
| AT+CGATT= [<state>] | OK<br>ERROR |
| AT+CGATT? | +CGATT: <state><br>OK |
| AT+CGATT=? | +CGATT: (list of supported <state>s)<br>OK |
| AT+CGATT=1 | OK |

# PDP Context Activate or Deactivate +CGACT

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

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 modem is not GPRS attached when the activation form of the command is executed, the modem first performs a GPRS attach and them attempts to activate the specified contexts. If the attach fails then the modem 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 context can be activated 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.

**Note:** See "Full GPRS AT Command Examples" later in this chapter.

**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 a context can be activated, the modem must be attached to the GPRS network by performing an automatic GPRS attach.

**Note:** If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.

**Syntax:** Command Syntax: AT+CGACT

| Command | Possible Response(s) |
|---|---|
| AT+CGACT=[<state> [,<cid>[,<cid>[,…]]]] | OK<br>ERROR |
| AT+CGACT? | +CGACT: <cid>, <state><br>[<CR><LF>+CGACT: <cid>, <state><br>[...]]<br>OK |
| AT+CGACT=? | +CGACT: (list of supported <state>s)<br>OK |
| AT+CGACT=1,1 | OK |
| AT+CGACT? | +CGACT: 1,1<br>OK |
| AT+CGACT=? | +CGACT: (0-1)<br>OK |

# Enter Data State +CGDATA

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

If the <cid> value is not defined to the modem, the modem will return an ERROR or +CME ERROR response. Otherwise, the modem 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 modem attempts to activate the context with whatever information is available to the modem. The other context parameters is 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 modem returns the final result code OK.

In case of an abnormal termination or start up, the V.25ter command state is re-entered and the modem 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.

**Note:** The goal of this command is the same than ATD*99***.

**Note:** If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.

**Values:** **<cid>** A numeric parameter which specifies a particular PDP context definition.

**Syntax:** Command Syntax: AT+CGDATA

| Command | Possible Response(s) |
|---|---|
| AT+CGDATA=[<cid>] | CONNECT<br>ERROR |
| AT+CGDATA=? | +CGDATA:<br>OK |
| AT+CGDATA=? | +CGDATA:<br>OK |
| AT+CGDATA=1 | CONNECT |

# GPRS Mobile Station Class +CGCLASS

**Description:** The set command is used to set the modem 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.

**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 modem 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 modem 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.

**Note:** During switch-On in CG class, the modem always performs an automatic GPRS attach (the ATTACH-STATUS parameter of +WGPRS is ignored). But if the modem is not already GPRS-attached when switching from B/CC class to CG class, then no automatic GPRS attach is performed.

**Example of the Automatic Attachment (See Note 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
```

**Syntax:** **Command Syntax:** AT+CGCLASS

| Command | Possible Response(s) |
|---|---|
| AT+CGCLASS= [<class>] | OK<br>ERROR |
| AT+CGCLASS? | +CGCLASS: <class><br>OK |
| AT+CGCLASS=? | +CGCLASS: (list of supported <class>s)<br>OK |
| AT+CGCLASS=”CG”<br>Note: Enter GPRS Class C mode | OK |
| AT+CGCLASS=”CC”<br>Note: Enter GMS mode | OK |
| AT+CGCLASS=”A”<br>Note: Chosen class not supported | +CME ERROR: 150 |
| AT+CGCLASS=? | +CGCLASS: (“CG”,”CC”)<br>OK |
| AT+CGCLASS? | +CGCLASS: (“CC”)<br>OK |

# Select Service for MO SMS Messages +CGSMS

**Description:** The set command specifies the service or service preference that the modem will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command requests information on the currently available services and service preferences.

**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.

**Syntax:** **Command Syntax:**

| Command | Possible Responses |
|---|---|
| AT+CGSMS= [<service>] | OK<br>ERROR |
| At+CGSMS? | +CGSMS: <service><br>OK |
| AT+CGSMS=? | +CGSMS: (list of currently available <service>s)<br>OK |
| AT +CGSMS=0 | OK |
| AT+CGSMS=? | +CGSMS=(0-3)<br>OK |

# GPRS Event Reporting +CGEREP

**Description:** Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from modem to DTE in the case of certain events occurring in the GPRS modem 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 modem as compound values.

**Values:** **<mode>:**

- **0** Buffer unsolicited result codes in the modem; if modem result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the DTE.
- **2** Buffer unsolicited result codes in the modem when modem-DTE link is reserved (e.g. in on-line data mode) and flush them to the DTE when modem-DTE link becomes available; otherwise forward them directly to the DTE.

**<bfr>**

- **0** Modem buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered. This is the only case supported.
- **1** Modem buffer of unsolicited result codes defined within this command is flushed to the DTE when <mode> 2 is entered. This case is not supported.

The software provides a combination of all modes. When a serial link is available, indications are forwarded directly to the DTE. If a serial link is reserved (e.g., in on-line data mode) or the modem result code buffer is full, the oldest ones can be discarded.

**Syntax:** **Command Syntax: AT+CGEREP**

| Command | Possible Responses |
|---|---|
| AT+CGEREP=[<mode>] | OK<br>ERROR |
| AT+CGEREP? | +CGEREP: <mode>,<bfr><br>OK |
| AT+CGEREP=? | +CGEREP: (list of supported <mode>s), (list of supported <bfr>s)<br>OK |

**Unsolicited Result Codes and Corresponding 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 modem was unable to report it to the DTE 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 modem.

**+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 modem.

**+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 modem.

**+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.

# GPRS Network Registration Status +CGREG

**Description:** The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the modem'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 modem. Location information elements <lac> and <ci> are returned only when <n>=2 and modem is registered in the network.

**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; the modem is not currently searching a new operator to which to register
- **1** Registered, home network
- **2** Not registered, but modem is currently searching a new operator to which to register
- **3** Registration denied
- **4** Unknown
- **5** Registered, roaming

**<lac>**

String type; two byte location area code in hexadecimal format

**<ci>**

String type; two byte cell ID in hexadecimal format

**Syntax:** **Command Syntax:** AT+CGREG

| Command | Possible response(s) |
|---|---|
| AT+CGREG=[<n>] | +CGREG: stat>[,<lac>,<ci>]<br>OK |
| AT+CGREG? | +CGREG: <n>,<stat>[,<lac>,<ci>]<br>OK<br>Note: +CME ERROR: <err> |
| AT+CGREG=? | +CGREG: (list of supported <n>s)<br>OK |

# Request GPRS IP Service D

**Description:** This command causes the modem to perform whatever actions are necessary to establish communication between the DTE and the external PDN.

The V.25ter 'D' (Dial) command causes the modem to enter the V.25ter online data state and, with the DTE, to start the specified layer 2 protocol. The modem returns CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behavior after the online data state has been entered is described briefly in clause 9, for IP, of GSM 07.60. GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

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 initialization AT command string to set values for for PDP type, APN, QoS etc.

If <cid> is not supported or is supported but omitted, the modem 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.)

**Note:** If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.

**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.

**Syntax:** **Command Syntax:**

| Command | Possible Responses |
|---|---|
| D*<GPRS_SC_IP>[***<cid>]# | CONNECT<br>ERROR |

**Example:**

ATD*99***1#
CONNECT
ATD*99***2#
ERROR

# Network Requested PDP Context Activation

In this mode of operation, the modem 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 modem as part of the modem initialization commands. The +CGAUTO command is used to select modem compatibility mode.

## *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 modem attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the DTE. Subsequently, the modem will announce a network request for PDP context activation by issuing the unsolicited result code RING to the DTE, followed by the intermediate result code CONNECT. The modem 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.

## *Manual Acceptance of a Network Request for PDP Aontext 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 modem 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.

## *Manual Rrejection 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 modem 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.

# Automatic Response to a Network Request for PDP Context Activation +CGAUTO

**Description:** The set command disables or enables an automatic positive response (auto-answer) 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 modem as a compound value.

When the +CGAUTO=0 command is received, the modem will not perform a GPRS detach if it is attached. Subsequently, when the modem announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the DTE 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 modem 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 DTE. Subsequently, when the modem announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the DTE, this is followed by the intermediate result code CONNECT. The modem 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.

**Values:** **<n>**

- **0** Turn off automatic response for GPRS only
  For <n> = 0 GPRS network requests are manually accepted or rejected by the +CGANS command.
- **1** Turn on automatic response for GPRS only
  For <n> = 1 GPRS network requests are automatically accepted according to the description above.
- **2** Modem compatibility mode, GPRS only
  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
- **3** Modem compatibility mode, GPRS and circuit switched calls (default)
  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 GPRS and GSM incoming calls simultaneously.

**Syntax:** **Command Syntax: AT+CGAUTO**

| Command | Possible response(s) |
|---|---|
| AT+CGAUTO=[<n>] | OK<br>ERROR |
| AT+CGAUTO? | +CGAUTO: <n><br>OK |
| AT+CGAUTO=? | +CGAUTO: (0-3)<br>OK |

**Example:**

AT+CGAUTO=?
+CGAUTO: (0-2)
OK
AT+CGAUTO?
+CGAUTO: 2
OK
AT+CGAUTO=0
OK

# Manual Response to a Network Request for PDP Context Activation +CGANS

**Description:** The execution command requests the modem to respond to a network request for GPRS PDP context activation which has been signalled to the DTE by the RING or +CRING: unsolicited result code. The <response> parameter allows the DTE to accept or reject the request.

If <response> is 0, the request is rejected and the modem returns OK to the DTE.

If <response> is 1, the following procedure is followed by the modem.

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 modem 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 modem 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 modem. 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 modem 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 modem 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.

**Values:** **<response>** 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.

**Syntax:** **Command Syntax:** AT+CGANS

| Command | Possible response(s) |
|---|---|
| AT+CGANS=[<response>, [<cid>]] | OK<br>ERROR |
| AT+CGANS=? | +CGANS: (list of supported <response>s), (list of supported <L2P>s)<br>OK |

**Example:**

```
+CRING: GPRS "IP", "122.41.74.238"
AT+CGANS=1
CONNECT
AT+CGANS=?
+CGANS= (0-1)
OK
```

# Show PDP Address +CGPADDR

**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.

**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 modem 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.

**Syntax:** **Command Syntax:** AT+CGPADDR

| Command | Possible response(s) |
|---|---|
| AT+CGPADDR=[<cid> [,<cid> [,…]]] | +CGPADDR: <cid>,<PDP_addr><br>[<CR><LF>+CGPADDR: <cid>,<PDP_addr><br>[...]]<br>OK |
| AT+CGPADDR=? | +CGPADDR: (list of defined <cid>s)<br>OK |

**Example:**

In this example, 1 <cid> is defined:
AT+CGPADDR=1
+CGPADDR=1,"107.210.5.4"
OK
AT+CGPADDR=?
+CGAPDDR= (1)
OK
AT+CGPADDR
+CGPADDR: 1,

# Cellular Result Codes +CRC

**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: REL ASYNC | for asynchronous non-transparent |
| +CRING: VOICE | for normal speech. |
| +CRING: GPRS | GPRS network request for PDP context activation |

If the modem is unable to announce to the DTE the network's request (for example it is in V.25ter online data state) the modem reject the request. No corresponding unsolicited result code is issued when the modem returns to a command state.

**Values:** No parameters

**Syntax:** **Command Syntax:** AT+CRC

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

# Service Reporting Control +CR

**Description:** This command enables a more detailed service reporting for incoming or outgoing calls. Before sending the CONNECT response to the application, the GSM modem will precisely define the type of data connection being established.

These report types are:

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

**Values:** No parameters

**Syntax:** **Command syntax:** AT+CR

| Command | Possible responses |
|---|---|
| AT+CR=0<br>Note: Extended reports disabled | OK<br>Note: Command valid |
| AT+CR=1<br>Note: Extended reports enabled | OK<br>Note: Command valid |

# Extended Error Report +CEER

**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.

**Values:** No parameters

**Syntax:** **Command Syntax:** AT+CEER

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

"NO CARRIER" indicates that the AT+CEER information is available for a failure diagnostic.
See *Failure Cause from GSM 04.08 Recommendation* in Appendix A.

# GPRS Parameters Customization +WGPRS

**Description:** This command modifies some of the GPRS parameters:

- The ATTACH-STATUS (the modem doesn't automatically make a GPRS attachment after initialization)
- The PDP-INIT-STATUS (activate automatically some defined PDP Contexts after initialization) and
- The user-defined multislot class. This parameter represents the GPRS class chosen by the user to perform power saving (by reducing TX [or uplink] time slots).

In addition, this command allows you to:

- Automatically set some defined PDP contexts to be activated after initialization.
- Set some parameters for the PALM® OS software: PPP Silent Mode (PPP waits for PPP Client to start the dialog) and Slow CONNECT due to the delay of the processing of PALM® OK, the CONNECT is sent one second after the dialing command request.

**Important Note:** The modem must be rebooted to activate the new setup except for <mode> 3, 5, 6 and 7 (refer to the Values section).

**Values:**

**<mode>** A numeric parameter which specifies a GPRS parameter:

| | |
|---|---|
| **0** | ATTACH-STATUS (the modem doesn't automatically make a GPRS attachment after init) |
| **1** | PDP-INIT-STATUS (declare some PDP contexts liable to be activated automatically after initialization by <mode>=2) |
| **2** | Set "ACTIVABLE" automatically after init a define PDP context |
| **3** | PPP silent mode |
| **4** | Definition of the GPRS multislot class |
| **5** | Slow CONNECT for PALM® OS |
| **6** | PPP Filtering |
| **7** | Automatic GPRS roaming inter-operator: if activated, the modem automatically re-attaches itself to the network and reactivates its PDP context by changing the operator when reaching border areas. |

**Notes:**

- If <mode>=0, 1, 3, 4, 5, 6 or 7 <cid> and <class> will be ignored.
- If <mode>=0, 1, 2, 3, 5, or 6 <class> will be ignored.
- If <mode>=4 <parameter> and <cid> will be ignored. The modem must be restarted to take the modification into account.
- PPP Filtering is a test-purpose functionality. It avoids sending some OS-specific frames on the radio link, for accurate transfer rate measurements.

**<parameter>** A numeric parameter that controls the operation defined by <mode> if it is equal to 0, 1, 2 or 3

| | |
|---|---|
| **0** | Operation Off (disabled) |
| **1** | Operation On (enabled) |

**<cid>** (PDP Context Identifier). A numeric parameter that specifies a particular PDP context definition. The parameter is local to the DTE-modem interface and is used in other PDP context-related commands. The range of values is 0 to 4.

**<class>** GPRS multislot class number. It may be loser than the maximum possible class. Possible values are 2, 8, 10, 12. Note that the range of values is dependent upon the modem.

| Multislot Class | Maximum Number of Slots | | | Minimum Number of Slots | | | | Type of MS |
|---|---|---|---|---|---|---|---|---|
| | Rx | Tx | Sum | $T_{ta}$ | $T_{tb}$ | $T_{ra}$ | $T_{rb}$ | |
| 2<br>8 | 2<br>4 | 1<br>1 | 3<br>5 | 3<br>3 | 2<br>1 | 3<br>2 | 1<br>1 | 1<br>1 |
| 10 | 4 | 2 | 5 | 3 | 1 | 2 | 1 | 1 |
| 12 | 4 | 4 | 5 | 2 | 1 | 2 | 1 | 1 |

**Notes:**

When the modem is set in CG class, the modem always makes an automatic GPRS attachment after initialization. AT+WGPRS? always gives +WGPRS: 0,0 for the parameter 0.

The default value for mode 7 is 0. In this case, no automatic GPRS reconnection to a new operator is done when reaching border areas.

**Syntax:** **Command Syntax:** AT+WGPRS=<mode>,<parameter>,[<cid>],[<class>]

| Command | Possible Responses |
|---|---|
| AT+WGPRS=? | +WGPRS: <mode>, <parameter1>,[<cid>]<br>[<CR><LF>+WGPRS: <mode>,<br><parameter>,[<cid>]<br>[...]]<br>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>)] [...]]<br>OK |
| AT+WGPRS=2,1,3<br>Note: Set ACTIVABLE to ON on PDP context 3 | OK |
| AT+WGPRS=7,1<br>Note: Set automatic re-attachment to the network and reactivation of PDP context in case of change of operator for MCC/MNC | OK |
| AT+WGPRS=4,,,18<br>Note: Choose GPRS multislot class 8 | OK |
| AT+WGPRS=?<br>Note: Request range of values | AT+WGPRS: (0-7),(0-1),(0-4),(2,8,10,12)<br>OK |
| AT+WGPRS?<br>Note:<br>– Automatic re-attachment at init not activated<br>– Automatic reactivation of PDP context at init not activated<br>– 3 PDP contexts and automatic reactivation only for cid 1<br><br><br><br>– PPP silent mode activated<br>– GPRS class is 8<br>– GPRS slow connect activated<br>– PPP filtering activated<br>– Automatic re-attachment and PDP reactivation at operator board area | <br><br>+WGPRS: 0,0<br>+WGPRS: 1,0<br><br>+WGPRS: 2,1,1<br>+WGPRS: 2,0,2<br>+WGPRS: 2,0,3<br>+WGPRS: 2,0,4<br><br>+WGPRS: 3,1<br>+WGPRS: 4,8<br>+WGPRS: 5,1<br>+WGPRS: 6,1<br>+WGPRS: 7,1<br><br>OK |

# Examples of Full GPRS AT Commands

## 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 as ATD*99***
AT +CGDATA=1
CONNECT
…….
                Data transfer
…….
+CGEV: NW DETACH
```

## Network Request

```
AT+CGAUTO=0
OK
+CRING: GPRS "IP", "211.45.89.152"
AT+CGANS=1
CONNECT
        …….  Data transfer
```

# Chapter 16 – Other AT Commands

## V.25ter Recommendation

The commands not listed in this document are not supported. For these commands, the product will then answer with "ERROR". All modulation control, error control and data compression commands are not recognized. An "ERROR" string will be returned.

## GSM 07.05 Recommendation

All the 07.05 commands not described in this manual are not implemented. The product will answer "ERROR" to these commands.

## GSM 07.07 Recommendation

All the 07.07 commands not described in this manual are not implemented. The product will answer "ERROR" to these commands.

# Appendix A – Result Codes, Failure Causes, Other Tables

## Chapter Summary

The following tables are included in Appendix A:

- ME error result code: +CME ERROR: <error>
- Message service failure result code: +CMS ERROR <er>
- Specific error results codes
- Failure Cause from GMS 05.08 recommendation (+CEER)
- Specific Failure Cause for +CEER
- GSM 04.11 Annex E-2: Mobile originating SM-transfer
- Unsolicited result codes
- Final result codes
- Intermediate result codes
- Parameter storage
- GMS sequences list
- Operator names
- CPHS Information field
- CSP constraints

# 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 personal PIN required (Network lock) | All GSM 07.07 commands (+CME ERROR: 40) |
| 42 | Network personal PIN required (Network subset lock) | All GSM 07.07 commands (+CME ERROR: 42) |
| 44 | Network personal PIN required (Service Provider lock) | All GSM 07.07 commands (+CME ERROR: 44) |
| 46 | Network personal PIN required (Corporate lock) | All GSM 07.07 commands (+CME ERROR: 46) |
| 103 | Illegal MS (#3) | +CGATT |
| 106 | Illegal ME (#6) | +CGATT |
| 107 | Mobile Station is not allowed to operate in GPRS | +CGATT |
| 111 | Mobile Station is not allowed to operate in the requested PLMN | +CGATT |
| 112 | Mobile Station is not allowed to make location updating in this area | +CGATT |
| 113 | Roaming not allowed in this area (#13) | +CGATT |
| 132 | service option not supported (#32) | +CGACT +CGDATA ATD*99 |
| 133 | requested service option not subscribed (#33) | +CGACT +CGDATA ATD*99 |
| 134 | service option temporarily out of order (#34) | +CGACT +CGDATA ATD*99 |
| 148 | unspecified GPRS error | All GPRS commands |
| 149 | PDP authentication failure | +CGACT +CGDATA ATD*99 |
| 150 | invalid mobile class | +CGCLASS +CGATT |

# Message Service Failure Result Code +CMS ERROR

**<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 E-2 | +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 |

# Specific Error Result Codes

| <error> | Meaning | Results from the following commands |
|---|---|---|
| 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” or “+CMS ERROR: 515”) except ATHO, ATH1, AT+WOIR, AT+WIOW, AT+CFUN=1, AT+CLCC, AT+WAC, AT+CPAS, AT+VGR, AT+VTS, AT+SPEAKER |
| 517 | SIM Toolkit facility not supported. | +STGI |
| 518 | SIM Toolkit indication not received. | +STGI |
| 519 | Reset 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 | Embedded application is activated so objects flash are not erased | +WOPEN |
| 533 | Missing or Unknown APN | ATD*99 +GACT +CGDATA |
| 536 | Class locked: A command has been launched from a port. The effect is to lock all commands belonging to the same class. If another port launches a command of this class, this error will occur as long as the class is not released (at first command’s completion time). | All commands |
| 537 | Phonebook group full. | +CPBW |
| 538 | Not enough space to copy SMS | +WMCP |
| 539 | Invalid SMS | +CMGR |
| 541 | Open AT® application and AT software version do not match | +WOPEN |
| 543 | CMUX connection is refused by remote, after a restart of CMUX protocol by the modem, due to a 27.010 connection loss during virtual channels establishment. | +CMUX |

**continued on next page**

**Continued: Specific Error Result Codes**

| <error> | Meaning | Results from the following commands |
|---|---|---|
| 544 | CMUX connection Timeout (no answer from the remote); i.e., no DLCO opened response. | +CMUX |
| 545 | A CMUX session has been started on a physical UART, and the user tries to start another CMUX session on another physical UART. The error, +CME ERROR: 545 is raised on the UART where AT+CMUX command is trying to be started again. | +CMUX |
| 546 | Emergency call is not allowed without SIM | +COPS |
| 547 | Emergency call is allowed without SIM | +COPS |
| 548 | No flash objects to delete | +WOPEN |
| 549 | The phone number of the requested phonebook entry is empty | ATD><index>[;],ATD><phonebook><index>[;] |
| 550 | Unable to resize the Application & Data storage place since the new required size would overlap with the current Open AT® application storage place | +WOPEN |
| 551 | Service abort request has failed | AT+WAC |
| 552 | Unsolicited responses for autodiag or charge indication are already activated on another port | +WDIAG, +WBCM |

# 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 |
| 224 | MS requested detach |
| 225 | NWK request Detach |
| 226 | Unsuccessful attach cause NO SERVICE |
| 227 | Unsuccessful attach cause NO ACCESS |
| 228 | Unsuccessful attach cause GPRS SERVICE REFUSED |
| 229 | PDP deactivation requested by NWK |
| 230 | PDP deactivation cause LLC link activation failed |
| 231 | PDP deactivation cause NWK reactivation with same TI |
| 232 | PDP deactivation cause GMM abort |
| 233 | PDP deactivation cause LLC or SNDCP failure |
| 234 | PDP unsuccessful activation cause GMM error |

**Continued on next page.**

### Continued: Failure Cause from GSM 04.08 Recommendation +CEER

| Cause Value | Diagnostic |
|---|---|
| 235 | PDP unsuccessful activation cause NWK reject |
| 236 | PDP unsuccessful activation cause NO NSAPI available |
| 237 | PDP unsuccessful activation cause SM refuse |
| 238 | PDP unsuccessful activation cause MMI ignore |
| 239 | PDP unsuccessful activation cause Nb Max Session Reach |

| All Other Values in the Range | Will Be Treated as Cause |
|---|---|
| [0,31] | 31 |
| [32,47] | 47 |
| [48,63] | 63 |
| [64,79] | 79 |
| [80,95] | 95 |
| [96,111] | 111 |
| [112,127] | 127 |

## 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 |

# GSM 04.11 Annex E-2: Mobile Originating SM-Transfer

These error causes could appear for **SMS commands** (+CMGS, +CMSS, +CMGD…)

| Error # | Error Label | Description |
|---|---|---|
| 1 | Unassigned (unallocated) number | 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). |
| 8 | Operator determined barring | The MS has tried to send a mobile originating short message when the MS's network operator or service provider has forbidden such transactions. |
| 10 | Call barred | The outgoing call barred service applies to the short message service for the called destination. |
| 21 | Short message transfer rejected | The equipment sending this cause does not wish to accept this short message, although it could have accepted the short message.This cause is neither busy nor incompatible. |
| 27 | Destination out of service | 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. |
| 28 | Unidentified subscriber | The subscriber is not registered in the PLMN (e.g., IMSI not known) |
| 29 | Facility rejected | The facility requested by the Mobile Station is not supported by the PLMN. |
| 30 | Unknown subscriber | The subscriber is not registered in the HLR (e.g., IMSI or directory number is not allocated to a subscriber). |
| 38 | Network out of order | The network is not functioning correctly and 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. |
| 41 | Temporary failure | The network is not functioning correctly and the condition is not likely to last a long period of time; e.g., the Mobile Station may wish to try another short message transfer attempt almost immediately. |
| 42 | Congestion | The short message service cannot be serviced because of high traffic. |
| 47 | Resources unavailable, unspecified | This cause is used to report a resource unavailable event only when no other cause applies. |
| 50 | Requested facility not subscribed | The requested short message service could |
| 69 | Requested facility not implemented | The network is unable to provide the requested short message service. |
| 81 | Invalid short message transfer reference value | 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. |
| 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. |
| 96 | Invalid mandatory information | 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). |
| 97 | Message type non-existent or not implemented | 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. |
| 98 | Message not compatible with short message protocol state | 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. |
| 99 | Information element non-existent or not implemented | 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.<br>However, the information element is not required to be present in the message so that the equipment sends the cause to process the message. |
| 111 | Protocol error, unspecified | This cause is used to report a protocol error event only when no other cause applies. |
| 127 | Interworking, unspecified | 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. |

**Note:** All values other than specified should be treated as error #41.

# Unsolicited Result Codes

| Verbose Result Code | Numeric (V0 set) | Description |
|---|---|---|
| +CALA: < time string>,<index> | As verbose | Alarm notification |
| +CBM: <length><pdu> (PDU) or +CBM:<sn>,<mid>,<dcs>,<page>,<pages>… (Text mode) | As verbose | Cell Broadcast Message directly displayed |
| +CBMI: "BM",<index> | As verbose | Cell Broadcast Message stored in mem at location <index> |
| +CCCM: <ccm> | As verbose | Current Call Meter value |
| +CCED: <values> | As verbose (specific) | Cell Environment Description indication |
| +CCWA:<number>,<type>, <class> [,<alpha>] | As verbose | Call Waiting number |
| +CDS: <fo>, <mr>… (text mode) or +CDS: <length>,… (PDU) | As verbose | SMS status report after sending a SMS |
| +CDSI: <mem>,<index> | As verbose | Incoming SMS Status Report after sending a SMS, stored in <mem> ("SR") at location <index> |
| +CKEV: <keynb> | As verbose | Key press or release |
| +CLIP: <number>, <type> [,,,<alpha>] | As verbose | Incoming Call Presentation |
| +CMT: <oa>…(text mode) or +CMT: [<alpha>,]… (PDU) | As verbose | Incoming message directly displayed |
| +CMTI: <mem>,<index> | As verbose | Incoming message stored in <mem> ("SM") at location <index> |
| +CREG: <stat> [,<lac>,<ci>] | As verbose | Network registration indication |
| +CRING: <type> | As verbose | Incoming call type (VOICE...) |
| +CSQ: <RxLev>,99 | As verbose | Automatic RxLev indication with AT+CCED=1,8 |
| +CSSU: <code2>[<number>,<type>] | As verbose | Supplementary service notification during a call |
| +STIN: <ind> | As verbose (specific) | SIM Toolkit Indication |
| +WIND: <IndicationNb> [,<CallId>] | As verbose (specific) | Specific unsolicited indication (SIM Insert/Remove, End of init, Reset, Alerting, Call creation/release) |
| +WVMI: <LineId>,<Status> | As verbose (specific) | Voice Mail Indicator notification (cf. +CPHS) |
| +WDCI: <LineId>,<Status> | As verbose (specific) | Diverted call indicator |
| RING | 2 | Incoming call signal from network |
| +CIEV | As verbose (specific) | Indicator event reporting |
| +CUSD: <m>,[<str>,<dcs>] | As verbose | USSD unsolicited response |

# Final Result Codes

| Verbose Result Code | Numeric (V0 set) | Description |
|---|---|---|
| +CME ERROR: <err> | As verbose | Error from GSM 07.05 commands |
| +CMS ERROR: <err> | As verbose | Error from SMS commands (07.07) |
| BUSY | 7 | Busy signal detected |
| ERROR | 4 | Command not accepted |
| NO ANSWER | 8 | Connection completion timeout |
| NO CARRIER | 3 | Connection terminated |
| OK | 0 | Acknowledges correct execution of a command line |
| RING | 2 | Incoming call signal from network |

# Intermediate Result Codes

| Verbose Result Code | Numeric (V0 set) | Description |
|---|---|---|
| +COLP:<number>,<type> | as verbose | Outgoing Call Presentation |
| +CR: <type> | as verbose | Outgoing Call report control |
| +ILRR: <rate> | as verbose | Local TA-TE data rate |
| CONNECT 300 | 10 | Data connection at 300 bauds |
| CONNECT 1200 | 11 | Data connection at 1200 bauds |
| CONNECT 1200/75 | 12 | Data connection at 1200/75 bauds |
| CONNECT 2400 | 13 | Data connection at 2400 bauds |
| CONNECT 4800 | 14 | Data connection at 4800 bauds |
| CONNECT 9600 | 15 | Data connection at 9600 bauds |
| CONNECT 14400 | 16 | Data connection at 14400 bauds |
| +CSSI: <code1>[,<index>] | As verbose | Supplementary service notification during a call setup |

# Parameter Storage Mode

| Parameter Storage Mode | | | | | |
|---|---|---|---|---|---|
| **Command** | **AT&W (E2P)** | **Command (E2P)** | **AT+CSAS (SIM, E2P)** | **AT&F (SIM, E2P)** | **Default values** |
| **General commands** | | | | | |
| +CMEE | X | | | X | 0 |
| +CSCS | X | | | X | “PCCP437” |
| +WPCS | X | | | X | “TRANSPARENT” |
| **Call Control commands** | | | | | |
| %D | | X | | X | 0 |
| ATS0 | X | | | X | 0 (no auto-answer) |
| +CICB | X | | | X | 2 (speech) |
| +CSNS | X | | | X | 0 (voice) |
| +ECHO | | X | | X | ,1,0,3,10,7 (Algo ID 1)<br>,3,30,8000,256 (Algo ID 3) |
| +SIDET | X | | | X | 1,2 |
| +SPEAKER | X | | | X | 0 (Spk 1 & Mic 1) |
| +VGR | X | | | X | 128 (speaker 1)<br>32 (speaker 2) |
| +VGT | X | | | X | 32 (mic 1 & ctrl 1)<br>0 (others) |
| **Network Service commands** | | | | | |
| +COPS | X | X | | X | 0,2 |
| +CREG | X | | | X | 0 |
| **Phonebook commands** | | | | | |
| +CSVM | | X | | X | 0 |
| +WAIP | X | | | X | 0 |
| +WCOS | | X | | | 0 |
| **SMS commands** | | | | | |
| +CNMI | | | X | X | 0,1,0,0,0 |
| +CMGF | X | | | X | 1 (text) |
| +CMMS | | | | | 0 |
| +CSCA | | | X | | SIM dependant (phase 2) |
| +CSDH | X | | | X | 0 |
| +CSMP | | | X | X | 1,167,0,0 |
| +CSMS | | X | | | 0 |
| +WUSS | | X | | X | 0 |
| **Supplementary Services commands** | | | | | |
| +CCUG | | X | | | 0,0,0 |
| +CCWA | X | | | X | 0 |
| +CLIP | X | | | X | 0 |
| +COLP | X | | | X | 0 |
| +CSSN | X | | | X | 0,0 |
| +CUSD | | X | | X | 0 |
| **Data commands** | | | | | |
| %C | X | | | X | 0 |
| \N | X | | | X | 0 |
| +CBST | X | | | X | 0,0,1 |
| +CR | X | | | X | 0 |
| +CRC | X | | | X | 0 |
| +CRLP | X | | | X | 61,61,48,6,1 |
| +DOPT | X | | | X | 1,1 |
| +DS | X | | | X | 3,0,2048,20 |
| +DR | X | | | X | 0 |
| +ILRR | X | | | X | 0 |

| Parameter Storage Mode | | | | | |
|---|---|---|---|---|---|
| **Command** | **AT&W (E2P)** | **Command (E2P)** | **AT+CSAS (SIM, E2P)** | **AT&F (SIM, E2P)** | **Default values** |
| **V24 – V25 commands** | | | | | |
| &C | X | | | | 1 |
| &D | X | | | | 2 |
| &S | X | | | | 1 |
| E | X | | | | 1 |
| Q | X | | | X | 0 |
| V | X | | | X | 1 |
| +ICF | X | | | | 3,4 |
| +IFC | X | | | | 2,2 |
| +IPR | X | | | | 115200 |
| +WMUX | X | | | X | 0 |
| **Specific commands** | | | | | |
| +ADC | | X | | X | 0 |
| +CMER | X | | | X | 0,0 |
| +CPHS | | X | | X | 1,0 for VMI<br>2,0 for MBN<br>4,0 for DCI |
| +WCCS | | X | | | Custom table is the same as PCCP437 to GSM table |
| +WCDM | | X | | X | 0,0 |
| +WCDP | | X | | X | 0 |
| +WDR | | X | | | 0,1 |
| +WIND | | X | | X | 0 |
| +WIOM | | X | | | May be 1023,0 or 0,0 |
| +WRIM | | X | | X | 0 |
| +WSVG | | X | | X | 0 |
| +WVR | | X | | | 5 |
| **SIM Toolkit commands** | | | | | |
| +STSF | | X | | | 0,”1F6BFFFF1F”,3,1 |
| **GPRS commands** | | | | | |
| +GCAUTO | X | | | X | 3 |
| +GCCLASS | | X | | | “B” |
| +GCDCONT | | X | | | |
| +GCEREP | X | | | X | 0 |
| +GCREG | X | | | X | 0 |
| +GCSMS | | X | | | 1 |
| +WGPRS | | X | | | 0,1<br>1,0<br>3,0<br>5,0<br>6,0 |

# GSM Sequences List

In accordance with **GSM Technical Specification 02.30**, the product supports the following GSM sequences, which can be used through the ATD and the +CKPD commands.

## Security

| | |
|---|---|
| **04*OLDPIN*NEWPIN*NEWPIN# | Change PIN code |
| **042*OLDPIN2*NEWPIN2*NEWPIN2# | Change PIN2 code |
| **05*PUK*NEWPIN*NEWPIN# | Unlock PIN code |
| **052*PUK2*NEWPIN2*NEWPIN2# | Unlock PIN2 code |
| *#06# | Show the IMEI number |

## Call Forwarding

| | |
|---|---|
| *SC# or<br>*SC**bs# | Activate<br>*or* |
| **SC*PhoneNumber# or<br>**SC*PhoneNumber*BS# or<br>**SC*PhoneNumber*[BS]*T# or<br>*SC*PhoneNumber# or<br>*SC*PhoneNumber*BS# or<br>*SC*PhoneNumber*[BS]*T# | Register and activate<br>*or*<br>*or*<br>*or*<br>*or*<br>*or* |
| *#SC#<br>*#SC**BS# | Check status<br>*or* |
| #SC#<br>#SC**BS# | Deactivate<br>*or* |
| ##SC#<br>##SC**BS# | Unregistered and deactivate<br>*or* |

**The Service codes (SC) are:**

| | |
|---|---|
| **002** | all call forwarding |
| **004** | all conditional call forwarding |
| **21** | call forwarding unconditional |
| **61** | call forwarding on no answer |
| **62** | call forwarding on not reachable |
| **67** | call busy |

**The Network service codes (BS) are:**

| | |
|---|---|
| **No code** | All tele and bearer services |
| **10** | All teleservices |
| **11** | Telephony |
| **12** | All data teleservices |
| **16** | Short Message Services |
| **17** | Voice Group Call Service |
| **18** | Voice Broadcast Service |
| **19** | All teleservices except SMS |
| **20** | All bearer services |
| **21** | All asynchronous services |
| **22** | All synchronous services |
| **24** | All data circuit synchronous |
| **25** | All data circuit asynchronous |
| **26** | All dedicated packet access |
| **27** | All dedicated PAD access |

**Note:** The no reply condition timer (T) is only used for SC = 002, 004 or 61.

## Call Barring

**Note:** SC values are listed below. BS values are covered in Call Forwarding

| | |
|---|---|
| *SC*Password#<br>*SC*Password*BS# | Activate<br>*or* |
| *#SC#<br>*#SC**BS# | Check status<br>*or* |
| #SC*Password#<br>#SC*Password*BS# | Deactivate<br>*or* |
| **03*330*OLDPWD*NEWPWD*NEWPWD#<br>**03**OLDPWD*NEWPWD*NEWPWD#<br>*03*330*OLDPWD*NEWPWD*NEWPWD#<br>*03**OLDPWD*NEWPWD*NEWPWD# | Change password for call barring<br>*or*<br>*or*<br>*or* |

**The Service codes (SC) are:**

| | |
|---|---|
| **33** | call barring of outgoing call |
| **330** | all barring service (only for deactivation) |
| **331** | call barring of outgoing international call |
| **332** | call barring of outgoing international calls except to HPLMN |
| **333** | all outgoing barring service (only for deactivation) |
| **35** | call barring of incoming calls |
| **351** | call barring of incoming calls if roaming |
| **353** | all incoming barring service (only for deactivation) |

**Note:** Network service codes (BS) are the same the call forwarding sequences.

## Call Waiting

| | |
|---|---|
| ***43*BS#** | Activate |
| ***#43*BS#** | Check status |
| **#43*BS#** | Deactivate |

## Number Presentation

| | |
|---|---|
| *#30# | CLIP check status |
| *#31# | CLIR check status |
| *31#PhoneNumber | Suppress CLIR for a voice call |
| #31#PhoneNumber | Invoke CLIR for a voice call |
| *#76# | COLP check status |

## Operator Names

Refer to the following documentation:

- SE13 (22nd August, 2005)
- NAPRD10 2.6.8

# CPHS Information Field

| CPHS Information | | |
|---|---|---|
| **Description** | **Data Field** | **Bit Field** |
| All information | 0 | None |
| CSP service activated and allocated | 1 | 0 |
| SST service activated and allocated | 2 | 1 |
| Mailbox Number service activated and allocated | 3 | 2 |
| Operator Name Shortform service activated and allocated | 4 | 3 |
| Information Numbers service activated and allocated | 5 | 4 |
| RFU | 6 | 5 |
| RFU | 7 | 6 |
| RFU | 8 | 7 |
| Voice Message Waiting Indicator for Line 1 | 9 | 8 |
| Voice Message Waiting Indicator for Line 2 | 10 | 9 |
| Data Message Waiting Indicator | 11 | 10 |
| Call Forward Activated Indicator for Line 1 | 13 | 12 |
| Call Forward Activated Indicator for Line 2 | 14 | 13 |
| Call Forward Activated Indicator for Data | 15 | 14 |
| Reserved | 17 | 16 |
| Reserved | 18 | 17 |
| Reserved | 19 | 18 |
| Reserved | 20 | 19 |
| Line 1 Mailbox Number Available | 21 | 20 |
| Line 2 Mailbox Number Available | 22 | 21 |
| Date Mailbox Number Available | 23 | 22 |
| EF Mn Updatable | 25 | 24 |

# CSP Constants

**Service Group: Call Offering**

| Service | External Value |
|---|---|
| Call Forwarding Unconditional | 1 |
| Call Forwarding on User Busy | 2 |
| Call Forwarding on No Rely | 3 |
| Call Forwarding on User Not Reachable | 4 |
| Call Transfer | 5 |

**Service Group: Call Restriction**

| Service | External Value |
|---|---|
| Barring of All Outgoing Calls | 9 |
| Barring of Outgoing International Calls | 10 |
| Barring of Outgoing International Calls except those directed to the Home PLMN country | 11 |
| Barring of All Outgoing Calls | 12 |
| BIC Roam | 13 |

**Service Group: Other Supplementary Services**

| Service | External Value |
|---|---|
| Multi-Party Service | 17 |
| Closed User Group | 18 |
| Advice of Charge | 19 |
| Perferential CUG | 20 |
| CUG Outgoing Access | 21 |

**Service Group: Group Completion**

| Service | External Value |
|---|---|
| Call Hold | 25 |
| Call Waiting | 26 |
| Completion of Call to Busy Subscriber | 27 |
| Restriction of the menus allowing use of user to user signalling | 28 |

**Service Group: Teleservices**

| Service | External Value |
|---|---|
| Short Message – Mobile Terminated | 33 |
| Short Message – Mobile Originated | 34 |
| Short Message – Cell Broadcast | 35 |
| Restricts menu options for the ability to set reply path active on outgoing Short Messages | 36 |
| SMS Delivery Confirmation | 37 |
| Restriction of menus for SMS Protocol ID options | 38 |
| Validity Period, restriction of menus for SMS Validity period options | 39 |

**Service Group: CPHS Teleservices**

| Service | External Value |
|---|---|
| Alternate Line Service | 41 |

**Service Group: Number Identification**

| Service | External Value |
|---|---|
| Calling Line Identification Presentation | 57 |
| Connected Line Identification Restriction | 59 |
| Connected Line Identification Presentation | 60 |
| Malicious Call Indicator | 61 |
| CLI per call mode – default block CLI – menu to send CLI | 63 |
| CLI per call mode – default block CLI – menu to block CLI | 64 |

**Service Group: Phase 2+ Services**

| Service | External Value |
|---|---|
| Menus concerned with GPRS functionality | 65 |
| Menus concerned with High Speed Circuit Switched Data functionality | 66 |
| ASCII Voice Group call menus | 67 |
| ASCII Voice Broadcast service menus | 68 |
| Multi Subscriber profile menus | 69 |
| Multi band: Restriction of menus allowing user to select a particular GSM 900/1800 or 1900 band | 70 |

**Service Group: Value Added Services**

| Service | External Value |
|---|---|
| Restriction of menus options for manual PLMN selection | 73 |
| Restriction of menus options for Voice Mail or other similar menus | 74 |
| Restriction of menus options for the ability to send Short Messages with type Paging | 75 |
| Restriction of menus options for the ability to send Short Messages with type Email | 76 |
| Restriction of menus options for Data calls | 78 |
| Restriction of menus allowing the user to change language | 80 |

**Service Group: Information Numbers**

| Service | External Value |
|---|---|
| The ME shall only present information numbers to the user if this field is set to FF | 81 |

# Appendix B - ME SIM Toolkit Support

**TABLE 1 – Support of SIM Toolkit classes** (This has been extracted from the GMS Technical Specification 11.14.)

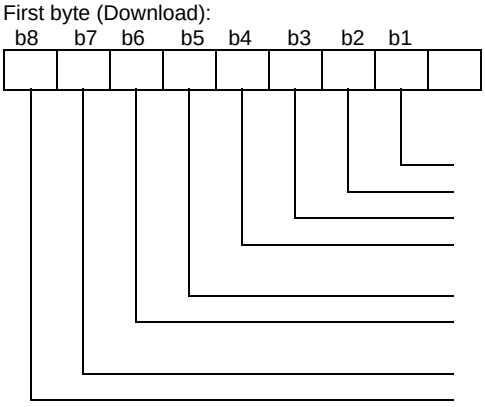
| Command description | | Class 1 | Class 2 | Class 3 |
|---|---|---|---|---|
| CALL CONTROL | | | X | X |
| CELL BROADCAST DOWNLOAD | | | X | X |
| DISPLAY TEXT | | | X | X |
| EVENT DOWNLOAD | | | | |
| - MT call | | | | X |
| - Call connected | | | | X |
| - Call disconnected | | | | X |
| - Location status | | | | X |
| - User activity | | | | X |
| - Idle screen available | | | | X |
| GET INKEY | | | X | X |
| GET INPUT | | | X | X |
| GET READER STATUS | $(MultipleCard)$ | | | Lc |
| MENU SELECTION | | | X | X |
| MO SHORT MESSAGE CONTROL | | | | X |
| MORE TIME | | | X | X |
| PERFORM CARD APDU | $(MultipleCard)$ | | | Lc |
| PLAY TONE | | | X | X |
| POLLING OFF | | | X | X |
| POLL INTERVAL | | | X | X |
| POWER ON CARD | $(MultipleCard)$ | | | Lc |
| POWER OFF CARD | $(MultipleCard)$ | | | Lc |
| PROVIDE LOCAL INFORMATION | | | X | X |
| REFRESH | | X | X | X |
| RUN AT COMMAND | $(AT$) | | | Lc |
| SELECT ITEM | | | X | X |
| SEND SHORT MESSAGE | | | X | X |
| SEND SS | | | X | X |
| SEND USSD | | | | X |
| SET UP CALL | | | X | X |
| SET UP EVENT LIST | | | | X |
| SET UP IDLE MODE TEXT | $(IdleModeText)$ | | | X |
| SET UP MENU | | | X | X |
| SMS-PP DOWNLOAD | | X | X | X |
| TIMER MANAGEMENT | $(Timer)$ | | | Lc |
| TIMER EXPIRATION | $(Timer)$ | | | Lc |

**TABLE 2 - Compatibility between Available Terminal Responses and Proactive Commands**

| | Proactive commands | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Terminal Reponses** | Setup Menu (**0**) | Display Text (**1**) | Get Inkey (**2**) | Get Input (**3**) | Setup Call (**4**) | Play Tone (**5**) | Select Item (**6**) | Refresh (**7**) | Send SS (**8**) | Send SMS (**9**) | Send USSD (**10**) | Setup event list (**11**) |
| **Backward Move (95)** | | • | • | • | | | • | | | | | |
| **Command beyond ME capabilities (96)** | • | • | • | • | • | • | • | • | • | • | • | • |
| **ME currently unable to process command (97)** | • | • | • | • | • | • | • | • | • | • | • | • |
| **No response from the user (98)** | | • | • | • | | | • | | | | | |
| **SIM session terminated by the user (99)** | | • | • | • | • | • | • | | | | | |

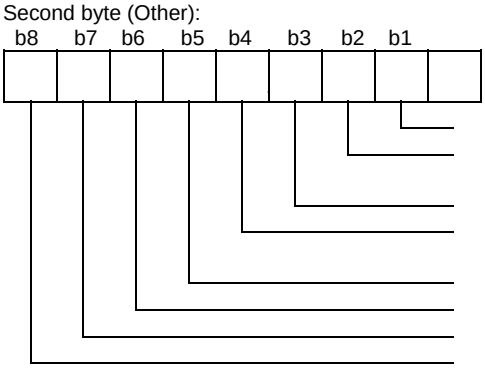
# Appendix C – Structure of the Terminal Profile

First byte (Download):



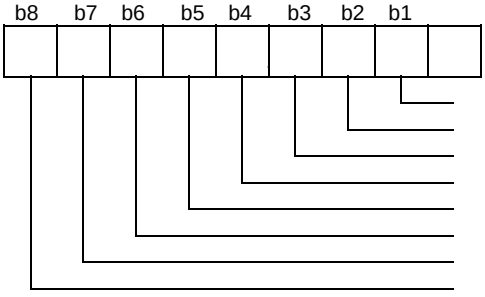

| | |
|---|---|
| Profile download | ***User choice*** |
| SMS-PP data download | ***Set by product to 1*** |
| Cell Broadcast data download | ***Set by product to 1*** |
| Menu selection | ***User choice*** |
| '9E XX' response code for SIM data download error | ***Set by product to 1*** |
| Timer expiration | ***Set by product to 0*** |
| USSD string data object supported in Call Control | ***User choice*** |
| RFU, bit=0 | |

Second byte (Other):



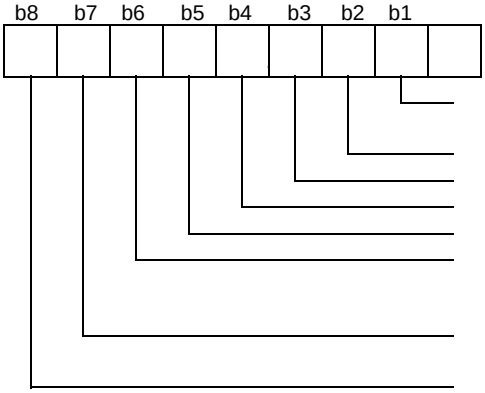

| | |
|---|---|
| Command result | ***User choice*** |
| Call Control by SIM | ***User choice*** |
| Cell identity included in Call Control by SIM | ***User choice*** |
| MO short message control by SIM | ***User choice*** |
| Handling of the alpha identifier according to subclause 9.1.3 | ***User choice*** |
| UCS2 Entry supported | ***User choice*** |
| UCS2 Display supported | ***User choice*** |
| Display of the extension text | ***User choice*** |

Third byte (Proactive SIM):



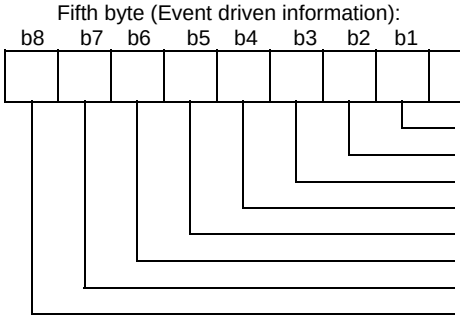

| | |
|---|---|
| Proactive SIM: DISPLAY TEXT | ***User choice*** |
| Proactive SIM: GET INKEY | ***User choice*** |
| Proactive SIM: GET INPUT | ***User choice*** |
| Proactive SIM: MORE TIME | ***User choice*** |
| Proactive SIM: PLAY TONE | ***User choice*** |
| Proactive SIM: POLL INTERVAL | ***Set by product to 1*** |
| Proactive SIM: POLLING OFF | ***Set by product to 1*** |
| Proactive SIM: REFRESH | ***User choice*** |

Fourth byte (Proactive SIM):



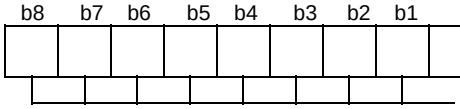

| | |
|---|---|
| Proactive SIM: SELECT ITEM | ***User choice*** |
| Proactive SIM: SEND SHORT MESSAGE | ***User choice*** |
| Proactive SIM: SEND SS | ***User choice*** |
| Proactive SIM: SEND USSD | ***User choice*** |
| Proactive SIM: SET UP CALL | ***User choice*** |
| Proactive SIM: SET UP MENU | ***User choice*** |
| Proactive SIM: PROVIDE LOCAL INFORMATION (MCC, MNC, LAC, Cell ID & IMEI) | ***Set by product to 1*** |
| Proactive SIM: PROVIDE LOCAL INFORMATION (NMR) | ***Set by product to 1*** |

Fifth byte (Event driven information):



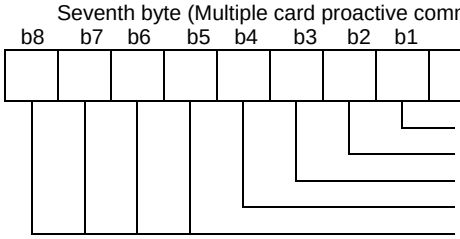

| | |
|---|---|
| Proactive SIM: SET UP EVENT LIST | ***Set by product to 1*** |
| Event: MT call | ***Set by product to 1*** |
| Event: Call connected | ***Set by product to 1*** |
| Event: Call disconnected | ***Set by product to 1*** |
| Event: Location status | ***Set by product to 1*** |
| Event: User activity | ***User choice*** |
| Event: Idle screen available | ***User choice*** |
| Event: Card reader status | ***Set by product to 0*** |

Sixth byte: (reserved for Event driven information extensions)



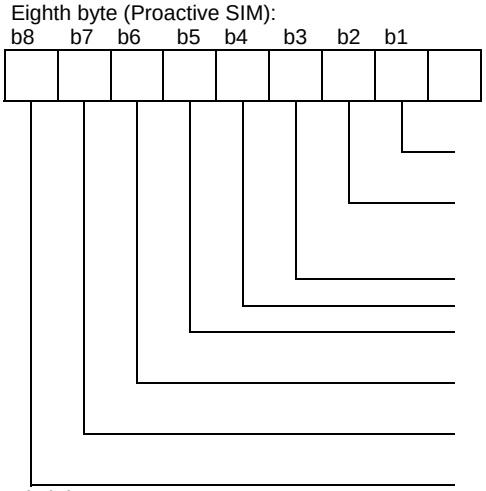

RFU, bit = 0

Seventh byte (Multiple card proactive commands) for class "a"



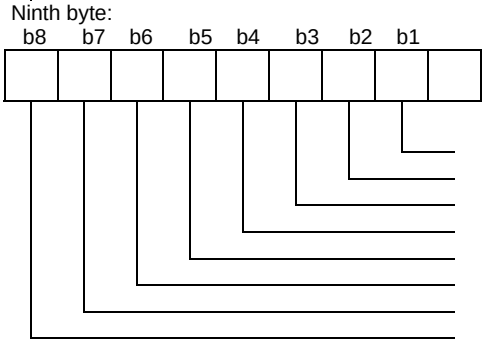

| | |
|---|---|
| Proactive SIM: POWER ON CARD | ***Set by product to 0*** |
| Proactive SIM: POWER OFF CARD | ***Set by product to 0*** |
| Proactive SIM: PERFORM CARD APDU | ***Set by product to 0*** |
| Proactive SIM: GET READER STATUS | ***Set by product to 0*** |
| RFU, bit = 0 | ***Set by product to 0*** |

Eighth byte (Proactive SIM):



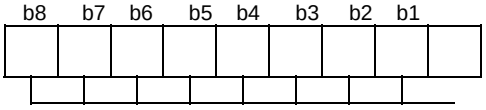

| | |
|---|---|
| Proactive SIM: TIMER MANAGEMENT (start, stop) | ***Set by product to 1*** |
| Proactive SIM: TIMER MANAGEMENT (get current value) | ***Set by product to 1*** |
| Proactive SIM: PROVIDE LOCAL INFORMATION (date, time and time zone) | ***Set by product to 0*** |
| Binary choice in GET INKEY | ***Set by product to 0*** |
| SET UP IDLE MODE TEXT | ***Set by product to 0*** |
| RUN AT COMMAND (e.g.. class "b" is supported) | ***Set by product to 0*** |
| 2nd alpha identifier in SET UP CALL | ***Set by product to 0*** |
| 2nd capability configuration parameter (see 9.1.6) | ***Set by product to 0*** |

Ninth byte:




| | |
|---|---|
| Sustained DISPLAY TEXT (see 6.4.1) | ***Set by product to 0*** |
| SEND DTMF command (see 6.4.24) | ***Set by product to 0*** |
| RFU, bit = 0 | |
| RFU, bit = 0 | |
| RFU, bit = 0 | |
| RFU, bit = 0 | |
| RFU, bit = 0 | |
| RFU, bit = 0 | |

Subsequent bytes:




RFU, bit = 0

# Appendix D – Command Type and Next Action Indicator

This table has been extracted from the GMS Technical Specification 11.14.

| Value | Name | Used for Type of Command coding | Used for Next Action Indicator coding |
|---|---|---|---|
| '00' | | - | - |
| '01' | REFRESH | X | |
| '02' | MORE TIME | X | |
| '03' | POLL INTERVAL | X | |
| '04' | POLLING OFF | X | |
| '05' | SET UP EVENT LIST | X | |
| '10' | SET UP CALL | X | X |
| '11' | SEND SS | X | X |
| '12' | SEND USSD | X | X |
| '13' | SEND SHORT MESSAGE | X | X |
| '14' | SEND DTMF | X | |
| '20' | PLAY TONE | X | X |
| '21' | DISPLAY TEXT | X | X |
| '22' | GET INKEY | X | X |
| '23' | GET INPUT | X | X |
| '24' | SELECT ITEM | X | X |
| '25' | SET UP MENU | X | X |
| '26' | PROVIDE LOCAL INFORMATION | X | |
| '27' | TIMER MANAGEMENT | X | |
| '28' | SET UP IDLE MODEL TEXT | X | X |
| '30' | PERFORM CARD APDU class "a" only | X | X |
| '31' | POWER ON CARD class "a" only | X | X |
| '32' | POWER OFF CARD class "a" only | X | X |
| '33' | GET READER STATUS class "a" only | X | X |
| '34' | RUN AT COMMAND class "b" only | X | |
| '81' | End of the proactive session | not applicable | X |

# Appendix G – Coding of Alpha fields in the SIM for UCS2

The coding can take one of the three following structures. If the ME supports UCS2 coding of alpha fields in the SIM, the ME shall support all three coding schemes for character sets containing 128 characters or less; for character sets containing more than 128 characters, the ME shall at least support the first coding scheme. If the alpha field record contains GSM default alphabet characters only, then none of these schemes shall be used in that record. Within a record, only one coding scheme, either GSM default alphabet, or one of the three described below, shall be used.

1. If the **first byte in the alpha string is '0x80'**, then the other bytes are 16 bit UCS2 characters. The more significant byte (MSB) of the UCS2 character is coded in the lower numbered byte of the alpha field, and the less significant byte (LSB) of the UCS2 character is coded in the higher numbered alpha field byte. In other words, byte 2 of the alpha field contains the more significant byte (MSB) of the first UCS2 character, and byte 3 of the alpha field contains the less significant byte (LSB) of the first UCS2 character (as shown below). Unused bytes shall be set to 'FF', and if the alpha field has an even number of bytes, then the last (unusable) byte shall be set to 'FF'.

   **Example 1**

| Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 | Byte 9 |
|---|---|---|---|---|---|---|---|---|
| '80' | $Ch1_{MSB}$ | $Ch1_{LSB}$ | $Ch2_{MSB}$ | $Ch2_{LSB}$ | $Ch3_{MSB}$ | $Ch3_{LSB}$ | 'FF' | 'FF' |

2. **If the first byte of the alpha string is set to 0x'81'**, then the second byte contains a value indicating the number of characters in the string. The third byte contains an 8-bit number that defines bits 15 to 8 of a 16-bit base pointer, where bit 16 is set to zero, and bits 7 to 1 are also set to zero. These sixteen bits represent a base pointer to a "half-page" in the UCS2 code space, to be used with some or all of the remaining bytes in the string. The fourth and subsequent bytes in the string contain codings as follows:
   - If bit 8 of the byte is set to zero, the remaining bits of the byte contain a GSM Default Alphabet character
   - If bit 8 of the byte is set to one, then the remaining bits are an offset value added to the 16-bit base pointer defined by byte 3, and the resulting 16-bit value is a UCS2 code point and defines a UCS2 character.

   **Example 2**

| Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 | Byte 9 |
|---|---|---|---|---|---|---|---|---|
| '81' | '05' | '13' | '53' | '95' | 'A6' | 'XX' | 'FF' | 'FF' |

   In the above example:
   - Byte 2 indicates there are 5 characters in the string
   - Byte 3 indicates bits 15 to 8 of the base pointer, and indicates a bit pattern of 0hhh hhhh h000 0000 as the 16 bit base pointer number. Bengali characters for example start at code position 0980 (0*000 1001 1*000 0000), which is indicated by the coding '13' in byte 3 (shown by the italicized digits).
   - Byte 4 indicates GSM Default Alphabet character '53'; e.g., "S".
   - Byte 5 indicates a UCS2 character offset to the base pointer of '15', expressed in binary as follows 001 0101, which, when added to the base pointer value results in a sixteen bit value of 0000 1001 1001 0101, e.g.. '0995', which is the Bengali letter KA.
   - Byte 8 contains the value 'FF', but as the string length is 5, this a valid character in the string, where the bit pattern 111 1111 is added to the base pointer, yielding a sixteen bit value of 0000 1001 1111 1111 for the UCS2 character (e.g., '09FF').
   - Byte 9 contains the padding value 0xFF.

3. **If the first byte of the alpha string is set to '0x82'**, then the second byte contains the length of the string (number of characters). The third and fourth bytes contain a 16-bit number that defines the complete 16-bit base pointer to a "half-page" in the UCS2 code space for use with some or all of the remaining bytes in the string. The fifth and subsequent bytes in the string contain coding as follows:
   - If bit 8 of the byte is set to zero, the remaining 7 bits of the byte contain a GSM Default Alphabet character
   - If bit 8 of the byte is set to one, the remaining 7 bits are an offset value added to the base pointer defined in bytes three and four, and the resultant 16 bit value is a UCS2 code point, and defines a UCS2 character.

**Example 3**

| Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 | Byte 9 |
|---|---|---|---|---|---|---|---|---|
| '82' | '05' | '05' | '30' | '2D' | '82' | 'D3' | '2D' | '31' |

In the above example

- Byte 2 indicates there are 5 characters in the string
- Bytes 3 and 4 contain a sixteen bit base pointer number of '0530', pointing to the first character of the Armenian character set.
- Byte 5 contains a GSM Default Alphabet character of '2D', which is a dash "-".
- Byte 6 contains a value '82', which indicates it is an offset of '02' added to the base pointer, resulting in a UCS2 character code of '0532', which represents Armenian character Capital BEN.
- Byte 7 contains a value 'D3', an offset of '53', which when added to the base pointer results in a UCS2 code point of '0583', representing Armenian Character small PIWR.

# Appendix F – Command Execution and Dependence on SIM

The following table lists AT command execution syntax and the execution condition. The SIM dependency column indicates if the command behavior will vary if another card is used. For example, it will vary for phonebook reading commands. The Intermediate column indicates if intermediate response can occur.

## General Commands

| AT Commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CGMI | +WIND: 3 | N | N |
| AT+CGMM | +WIND: 3 | N | N |
| AT+CGMR | +WIND: 3 | N | N |
| AT+CGSN | +WIND: 3 | N | N |
| AT+CSCS | +WIND: 4 | N | N |
| AT+WPCS | +WIND: 4 | N | N |
| AT+CIMI | +WIND: 4 | Y | N |
| AT+CCID | +WIND: 1 | Y | N |
| AT+GCAP | +WIND: 3 | N | N |
| A/ | Depends on previous command | Depends on prev. command | N |
| AT+CPOF | +WIND: 3 without SIM,<br>+WIND: 1 with SIM | N | N |
| AT+CFUN | +WIND: 3 | N | N |
| AT+CPAS | +WIND: 3 | N | N |
| AT+CMEE | +WIND: 3 | N | N |
| AT+CKPD | Depends of the sequence used | Y/N | N |
| AT+CCLK | +WIND: 3 | Y | N |
| AT+CALA | +WIND: 3 | N | Y |
| AT+CRMP | +WIND: 3 | N | N |
| AT+CRSL | +WIND: 3 | N | N |
| AT+CMUX | | N | N |

## Call Control Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| ATD | Depends of sequence used | Y/N | Y |
| ATH | +WIND: 3 | N | N |
| ATA | +WIND: 3 | N | N |
| AT+CEER | +WIND: 4 | Y | N |
| AT+VTD | +WIND: 3 | N | N |
| AT+VTS | +WIND: 5 | N | N |
| ATDL | +WIND: 3 | N | Y |
| AT%D | +WIND: 3 | N | N |
| ATS0 | +WIND: 3 | N | N |
| AT+CICB | +WIND: 3 | N | N |
| AT+CSNS | +WIND: 3 | N | N |
| AT+VGR | +WIND: 3 | N | N |
| AT+VGT | +WIND: 3 | N | N |
| AT+CMUT | +WIND: 5 | N | N |
| AT+SPEAKER | +WIND: 3 | N | N |
| AT+ECHO | +WIND: 3 | N | N |
| AT+SIDET | +WIND: 3 | N | N |
| AT+VIP | +WIND: 3 | N | N |

# Network Service Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CSQ | +WIND: 3 | N | N |
| AT+COPS | +WIND: 4 | Y | N |
| AT+CREG | +WIND: 3 | N | Y |
| AT+WOPN | +WIND: 3 | N | N |
| AT+CPLS | PIN | Y | N |
| AT+CPOL | After PIN entered | Y | Y |
| AT+COPN | After PIN entered | N | N |

# Security Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CPIN | +WIND: 1 | Y | N |
| AT+CPIN2 | after PIN entered | Y | N |
| AT+CPINC | +WIND: 1 | Y | N |
| AT+CLCK | +WIND: 4 | Y | N |
| AT+CPWD | +WIND: 4 | Y | N |

# Phonebook Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CPBS | +WIND: 4 | Y | N |
| AT+CPBR | +WIND: 4 | Y | Y |
| AT+CPBF | +WIND: 4 | Y | Y |
| AT+CPBW | +WIND: 4 | Y | N |
| AT+CPBP | +WIND: 4 | Y | Y |
| AT+CPBN | +WIND: 4 | Y | Y |
| AT+CNUM | +WIND: 4 | Y | N |
| AT+WAIP | +WIND: 3 | N | N |
| AT+WDCP | +WIND: 4 | Y | N |
| AT+CSVM | +WIND: 4 | N | N |
| AT+WCOS | +WIND: 3 | N | N |
| AT+WPGW | +WIND: 4 | N | N |
| AT+WPGR | +WIND: 4 | N | Y |
| AT+WPGS | +WIND: 4 | N | Y |

# Short Messages Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CSMS | +WIND: 16 | Y | N |
| AT+CNMA | +WIND: 16 | Y | N |
| AT+CPMS | +WIND: 16 | Y | N |
| AT+CMGF | +WIND: 3 | Y | N |
| AT+CSAS | +WIND: 3 | Y | N |
| AT+CRES | +WIND: 3 | Y | N |
| AT+CSDH | +WIND: 16 | Y | N |
| AT+CNMI | +WIND: 16 | Y | N |
| AT+CMGR | +WIND: 16 | Y | Y |
| AT+CMGL | +WIND: 16 | Y | Y |
| AT+CMGS | +WIND: 16 | Y | N |
| AT+CMGW | +WIND: 16 | Y | Y |
| AT+CMSS | +WIND: 16 | Y | N |
| AT+CSMP | +WIND: 16 | Y | N |
| AT+CMGD | +WIND: 16 | Y | N |
| AT+CSCA | +WIND: 16 | Y | N |
| AT+CSCB | +WIND: 16 | Y | N |
| AT+WCBM | +WIND: 16 | Y | N |
| AT+WMSC | +WIND: 16 | Y | Y |
| AT+WMGO | +WIND: 16 | Y | N |
| AT+WUSS | +WIND: 3 | N | N |
| AT+WMCP | +WIND: 16 | Y | N |
| AT+CMMS | +WIND: 3 | Y | N |

# Supplementary Services Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CCFC | +WIND: 4 | Y | N |
| AT+CLCK | +WIND: 4 | Y | N |
| AT+CPWD | +WIND: 4 | Y | N |
| AT+CCWA | +WIND: 4 | Y | N |
| AT+CLIR | After PIN entered | Y | N |
| AT+CLIP | After PIN entered | Y | N |
| AT+COLP | After PIN entered | Y | N |
| AT+CAOC | After PIN entered | Y | Y |
| AT+CACM | After PIN entered | Y | N |
| AT+CAMM | After PIN entered | Y | N |
| AT+CPUC | After PIN entered | Y | N |
| AT+CHLD | +WIND: 5,2 | Y | N |
| AT+CLCC | +WIND: 3 | N | N |
| AT+CSSN | +WIND: 3 | N | N |
| AT+CUSD | +WIND: 3 | N | N |
| AT+CCUG | +WIND: 4 | Y | Y |

# Data Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CBST | +WIND: 3 | N | N |
| AT+FCLASS | +WIND: 3 | N | N |
| AT+CR | +WIND: 3 | N | N |
| AT+CRC | +WIND: 3 | N | N |
| AT+ILRR | After PIN entered | N | N |
| AT+CRLP | +WIND: 3 | N | N |
| AT+DOPT | +WIND: 3 | N | N |
| AT%C | +WIND: 3 | N | N |
| AT+DS | +WIND: 3 | N | N |
| AT+DR | +WIND: 3 | N | N |
| \N | +WIND: 3 | N | N |

# V24-V25 Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+IPR | +WIND: 3 | N | N |
| AT+ICF | +WIND: 3 | N | N |
| AT+IFC | +WIND: 3 | N | N |
| AT&C | +WIND: 3 | N | N |
| AT&D | +WIND: 3 | N | N |
| AT&S | +WIND: 3 | N | N |
| ATO | +CLCC:X,0,0,1,X (data call) | N | N |
| ATQ | +WIND: 3 | N | N |
| ATV | +WIND: 3 | N | N |
| ATZ | +WIND: 3 | N | N |
| AT&W | +WIND: 3 | N | N |
| AT&T | +WIND: 3 | N | N |
| ATE | +WIND: 3 | N | N |
| AT&F | +WIND: 3 | N | N |
| AT&V | +WIND: 3 | N | N |
| ATI | +WIND: 3 | N | N |
| AT+WMUX | +WIND: 3 | N | N |

# Specific AT Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CCED | +WIND: 3 | N | N |
| AT+WIND | +WIND: 3 | N | N |
| AT+ADC | +WIND: 3 | N | N |
| AT+CMER | +WIND: 3 | N | N |
| AT+WLPR | +WIND: 1 | N | N |
| AT+WLPW | +WIND: 3 | N | N |
| AT+WIOR | +WIND: 1 | N | N |
| AT+WIOW | +WIND: 1 | N | N |
| AT+WIOM | +WIND: 3 | N | N |
| AT+WAC | +WIND: 3 | N | N |
| AT+WTONE | +WIND: 3 | N | N |
| AT+WDTMF | +WIND: 3 | N | N |
| AT+WDWL | +WIND: 3 | N | N |
| AT+WVR | +WIND: 3 | N | N |
| AT+WDR | +WIND: 3 | N | N |
| AT+WSVG | +WIND: 3 | N | N |
| AT+WSTR | +WIND: 3 | N | N |
| AT+WSCAN | +WIND: 3 | N | N |
| AT+WRIM | +WIND: 3 | N | N |
| AT+W32K | +WIND: 3 | N | N |
| AT+WCDM | +WIND: 3 | N | N |
| AT+WCCS | +WIND: 4 | N | N |
| AT+WLCK | None (PIN for auto CNL) | N (Y for auto CNL) | N |
| AT+CPHS | +WIND: 4 | Y | N |
| AT+WMIR | +WIND: 3 | N | N |
| AT+WCDP | +WIND: 3 | N | N |
| AT+WMBN | PIN | Y | N |
| AT+WALS | +WIND: 4 | | |
| AT+WOPEN | +WIND: 3 | N | N |
| AT+WRST | +WIND: 3 | N | N |
| AT+WSST | +WIND: 3 | N | N |
| AT+WATH | +WIND: 3 | N | N |
| AT+WMBS | +WIND: 3 | N | N |

# SIM Toolkit Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+STSF | None | N | N |
| AT+STIN | +WIND: 4 | Y | N |
| AT+STGI | +WIND: 4 | Y | N |
| AT+STGR | +WIND: 4 | Y | N |

# GPRS Commands

| AT commands | Conditions | SIM dependence | Intermediate |
|---|---|---|---|
| AT+CGDCONT | +WIND: 4 | | |
| AT+CGQREQ | +WIND: 4 | | |
| AT+CGQMIN | +WIND: 4 | | |
| AT+CGATT | +WIND: 4 | | |
| AT+CGACT | +WIND: 4 | | |
| AT+CGDATA | +WIND: 4 | | |
| AT+CGCLASS | +WIND: 3 | N | N |
| AT+CGCLASS | +WIND: 4 | | |
| AT+CGSMS | +WIND: 4 | | |
| AT+CGREP | +WIND: 4 | | |
| AT+CGREG | +WIND: 4 | | |
| AT+CGAUTO | +WIND: 4 | | |
| AT+CGANS | +WIND: 4 | | |
| AT+CGADDR | +WIND: 4 | | |
| AT+WGPRS | +WIND: 3 | None | N |

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