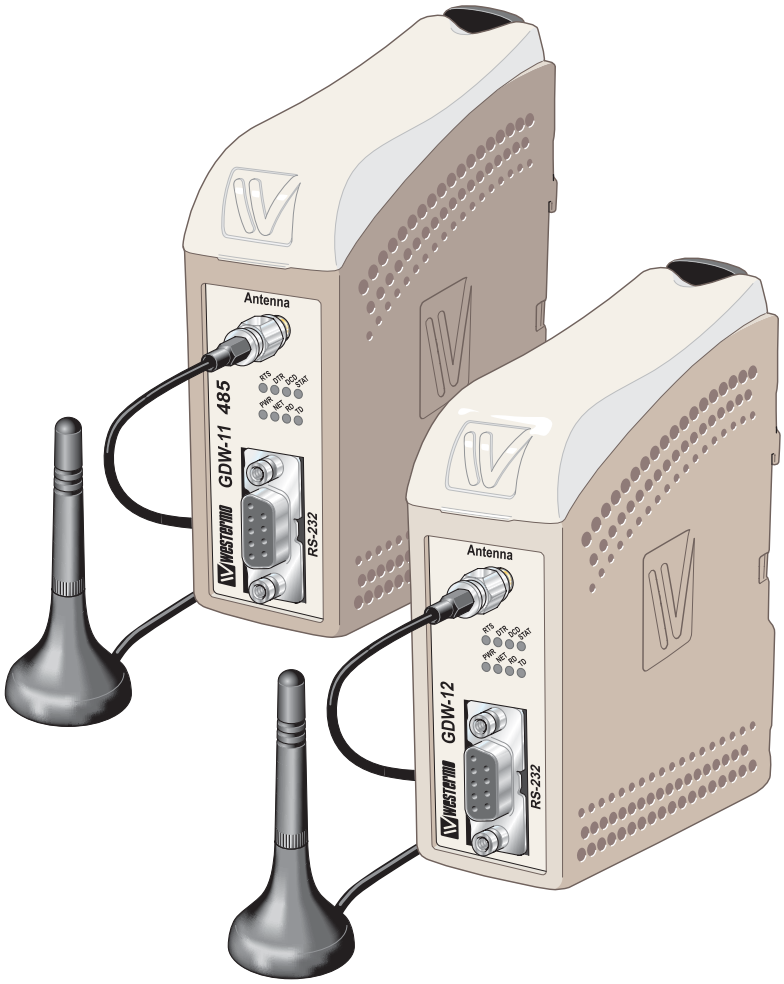
AT Commands
Interface Guide
6615-2220

GDW-11



GDW-11 GSM/GPRS Modem

GDW-11 485 GSM/GPRS Modem with RS-485

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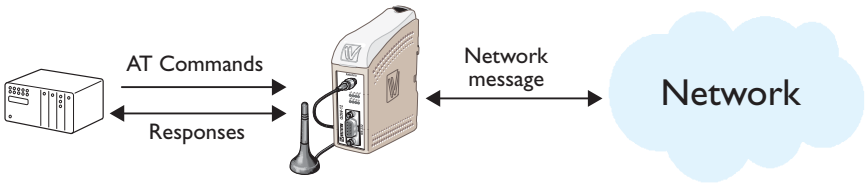
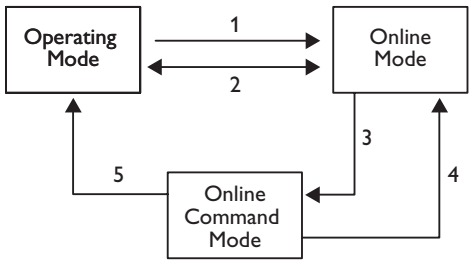
Introduction

This document describes the AT-commands that can be used to configure and control the GDW-1x modem.



The GDW-1x different operating modes are controlled by AT-commands.
Modem operation modes:



Example of commands/events that can trigger a change of the modems operation modes

1 – ATD command
2 – Hangup from the remote end
3 – Escape sequence +++
4 – ATO command
5 – ATH command

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Abbreviations and definitions

Abbreviations

ASCII	**A**merican **S**tandard **C**ode for **I**nformation **I**nterchange
AT	**AT**tention; this two-character abbreviation is always used to start a command line to be sent from TE to Modem
BCD	**B**inary **C**oded **D**ecimal
ETSI	**E**uropean **T**elecommunications **S**tandards **I**nstitute
IMEI	**I**nternational **M**obile station **E**quipment **I**dentity
IRA	**I**nternational **R**eference **A**lphabet (ITU-T T.50 [13])
ISO	**I**nternational **S**tandards **O**rganisation
ITU-T	**I**nternational **T**elecommunication **U**nion – **T**elecommunications Standardization Sector
ME	**M**obile **E**quipment, e.g. a GSM phone (equal to MS; Mobile Station)
MOC / MTC	A call from a GSM mobile station to the PSTN is called a "**M**obile **O**riginated **C**all" (MOC) or "outgoing call", and a call from a fixed network to a GSM mobile station is called a "**M**obile **T**erminated **C**all" (MTC) or "incoming call".
MoU	**M**emorandum **o**f **U**nderstanding (GSM operator joint)
MS	The words "**M**obile **S**tation" (MS) or "**M**obile **E**quipment" (ME) are used for mobile terminals supporting GSM services.
RLP	**R**adio **L**ink **P**rotocol
SIM	**S**ubscriber **I**dentity **M**odule
TA	**T**erminal **A**daptor, e.g. a GSM data card (equal to DCE; **D**ata **C**ircuit terminating **E**quipment)
TE	**T**erminal **E**quipment, e.g. a computer (equal to DTE; **D**ata **T**erminal **E**quipment) Terminal Equipment is the Man-Machine Interface of a GSM device (modem or handset). A TE can be a handset MMI or the AT command line interface.
TIA	**T**elecommunications **I**ndustry **A**ssociation

Definitions

<CR>	Carriage return character, which value is specified with command S3.
<LF>	Linefeed character, which value is specified with command S4.
<...>	Name enclosed in angle brackets is a syntactical element. Brackets themselves do not appear in the command line.
[...]	Optional subparameter of a command or an optional part of ME information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in *parameter type* commands, new value equals to its previous value. In *action type* commands, action should be done on the basis of the recommended default setting of the subparameter
underline	Underlined defined subparameter value is the recommended default setting of this subparameter. In *parameter type* commands, this value should be used in factory settings that are configured by V.25ter command &F0. In *action type* commands, this value should be used when subparameter is not given.

AT command syntax

Command line

All commands always start with AT (ATtention) and are terminated with <CR>.

There are 3 exceptions to this rule:

- The A/ command is not terminated with <CR>.
- Some commands where input text is the final parameter to the command is terminated with character (ASCII 26 or <ctrl+z>). One example of such command is AT+CMGS.
- The command to switch from "on-line mode" to "online command mode" is +++ and this command is not terminated with <CR>

There are 3 different types of commands that differ slightly in command format and the command response:

- Standardized *basic* commands
- *Register* commands.
- *Extended* commands.

The basic commands are commands not preceded by a '+' character.
Most of the basic commands originate in the V.25ter [TBD] standard.

Action	Command	Example
Set/Execute	CMD[x]	AT&D2, AT&W, ATD

The register commands is a set of S-registers that contain parameter values needed by the modem in different modes.

Syntax: ATSx=<value>

Test command: ATSx?

Possible values: ATSx=?

The S-registers are saved by the AT&W command and Refer to section "S-registers" for more information.

Every **extended command** has a test command (trailing =?) to test the existence of the command and to give information about the type of its subparameters. Parameter type commands also have a read command (trailing ?) to check the current values of subparameters. Action type commands do not store the values of any of their possible subparameters, and therefore do not have a read command.

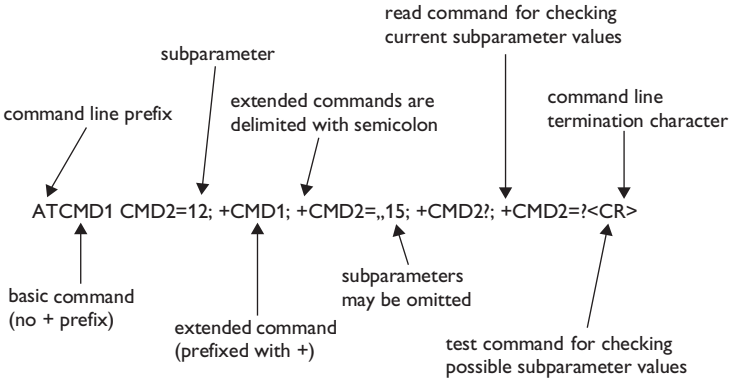


Figure 1: Basic structure of a command line

If verbose responses are enabled with command V1 and all commands in a command line has been performed successfully, result code **<CR><LF>OK<CR><LF>** is sent from the TA to the TE. If numeric responses are enabled with command V0, result code **0<CR>** is sent instead.

If verbose responses are enabled with command V1 and subparameter values of a command are not accepted by the TA (or command itself is invalid, or command cannot be performed for some reason), result code **<CR><LF>ERROR<CR><LF>** is sent to the TE and no subsequent commands in the command line are processed. If numeric responses are enabled with command V0, result code **4<CR>** is sent instead. ERROR (or 4) response may be replaced by **+CME ERROR: <err>** see appendix when command was not processed due to an error related to ME operation.

Responses and result codes

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

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

The TA response for the example command line of figure 1 could be as shown in figure 2. Here, verbose response format is enabled with command **V1**. If numeric format **V0** would have been used, **<CR><LF>** headers of information responses would have been left out and final result code changed to **0<CR>**.

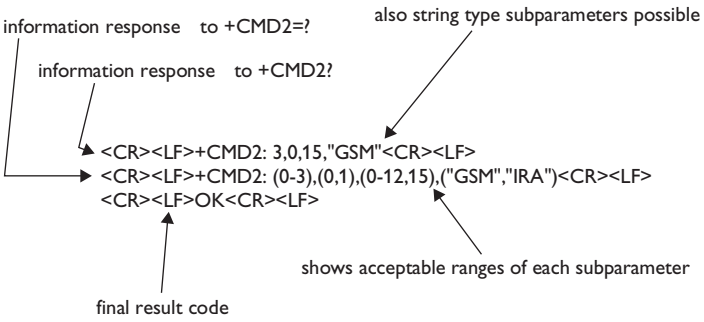


Figure 2: Response to a command line

So called intermediate result codes inform about progress of TA operation (e.g. connection establishment CONNECT), and so called unsolicited result codes indicate occurrence of an event not directly associated with issuance of a command from TE (e.g. ring indication RING).

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

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

General commands

+CGMI – Manufacturer identification

Description:

This command gives the manufacturer identification.

Syntax:

AT+CGMI

Parameters:

No parameters

Command example	Possible responses	Note
AT+CGMI	WESTERMO MODEM	Modem manufacturer
OK		

+CGMM – Request model identification

Description:

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

Syntax:

AT+CGMM

Parameters:

No parameters

Command example	Possible responses	Note
AT+CGMM	MULTIBAND 900E 1800	Support of 900 and 1800 MHz
OK		
AT+CGMM	MULTIBAND G850 1900	Support of 850 and 1900 MHz
OK		

+CGMR – Request revision identification

Description:

This command is used to get the software version.

Syntax:

AT+CGMR

Parameters:

No parameters

Command example	Possible responses	Note
AT+CGMR	641_09gg.Q2406B 1328940 ...	Software release 6.41

+CGSN – Product Serial Number

Description:

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

Syntax:

AT+CGSN

Parameters:

No parameters

Command example	Possible responses	Note
AT+CGSN	135790248939000	IMEI read from modem
OK		

+CSCS – Select TE character set

Description:

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

Syntax:

AT+CSCS=<Character Set>

Parameters:

<Character Set>

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

Command example	Possible responses	Note
AT+CSCS="GSM"	OK	Command valid
AT+CSCS="PCCP437"	OK	Command valid
AT+CSCS=?	+CSCS:("GSM","PCCP437", "CUSTOM","HEX") OK	Possible values

+WPCS – Phonebook Character Set

Description:

This specific command informs the ME which character set is used by the TE for the phonebooks. The ME can convert each character of entered or displayed strings. This is used to read or write phonebook entries (parameters <text>, <address> and <mail>) and <description> parameter of agenda entries. See also +CSCS for the short messages character sets.

Syntax:

AT+WPCS=<Character Set>

Parameters:

<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 (see also. +WCCS command).
"HEX"	Hexadecimal mode. No character set used; the user can read or write hexadecimal values.

Command example	Possible responses	Note
AT+WPCS= "TRANSPARENT"	OK	Command valid
AT+WPCS="CUSTOM"	OK	Command valid
AT+WPCS=?	+WPCS:("TRANSPARENT", "HEX","CUSTOM")	Possible values
OK		

+CIMI – Request IMSI

Description:

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

Syntax:

AT+CIMI

Parameters:

No parameters

Command example	Possible responses	Note
AT+CIMI	208200120320598	IMSI value (15 digits), starting with MCC (3 digits) / MNC (2 digits, 3 for PCS 1900)

+CCID – Card Identification

Description:

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

Syntax:

AT+CCID

Parameters:

No parameters

Command example	Possible responses	Note
AT+CCID	+CCID: "123456789. . . OK	EF-CCID is present, hexadecimal format
AT+CCID?	+CCID: "123456789 . . . OK	Same result as +CCID
AT+CCID=?	OK	No parameter but this command is valid

+GCAP – Capabilities list

Description:

This command gets the complete list of capabilities.

Syntax:

AT+GCAP

Parameters:

No parameters

Command example	Possible responses	Note
AT+GCAP	+GCAP: +CGSM +FCLASS OK	Supports GSM and FAX commands

+CPOF – Power down modem software

Description:

This command stops the GSM software stack as well as the hardware layer. The AT+CFUN=0 command is equivalent to +CPOF. After AT+CPOF=1, the modem will not respond to AT commands. To reset it, use the hard reset.

Syntax:

AT+CPOF

Parameters:

No parameters

Command example	Possible responses	Note
AT+CPOF	OK	Command valid
AT+CPOF=1	OK	Command valid

+CFUN – Set modem functionality

Description:

This command 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 be 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.

Syntax:

AT+CFUN=<functionality level>

Parameters:

<functionality level>

0: Execute an IMSI detach

1: Restart the whole GSM registration process.

Command example	Possible responses	Note
AT+CFUN?	+CFUN: 1 OK	Full functionality indicated Command valid
AT+CFUN=0	OK	Detach from network.
AT+CFUN=1	OK	Set the full functionality mode with a complete software reset

+CPAS – Modem activity status

Description:

This command returns the activity status of the mobile equipment.

Syntax:

AT+CPAS

Parameters:

<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)

Command example	Possible responses	Note
AT+CPAS	+CPAS: <pas>	Current activity status OK

+CMEE – Report Mobile Equipment errors

Description:

This command disables or enables the use of the "+CME ERROR : <xxx>" or "+CMS ERROR :<xxx>" result code instead of simply "ERROR".

See chapter "error codes" for "+CME ERROR" result codes description and "+CMS ERROR" result codes.

Syntax:

AT+CMEE=<error reporting flag>

Parameters:

<error reporting flag>

0: Disable ME error reports, use only "ERROR"

1: Enable long error reports, "+CME ERROR xxx" or "+CMS ERROR xxx"

Command example	Possible responses	Note
AT+CMEE=0	OK	Disable ME error reports, use only « ERROR »
AT+CMEE=1	OK	Enable "+CME ERROR: <xxx>" or "+CMS ERROR: <xxx>" result codes
AT+CMEE=?	+CMEE: (0,1) OK	Possible values
AT+CMEE?	+CMEE: 1 OK	Current value

+CKPD – Keypad control

Description:

This command emulates the ME keypad by sending each keystroke as a character in a <keys> string. The supported GSM sequences are listed below in this manual. 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.

Syntax:

AT+CKPD=<keys>

Parameters:

<keys>

0-9,*,# characters allowed in the keypad control string

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

+CCLK – Clock Management

Description:

This command is used to set or get the current date and time of the ME real-time clock. Default date/time is "00/01/01,00:00:00" (January 1st, 2000 / midnight).

NOTE:

The ME realtime clock does not have any battery backup, a ME power down means that the real time clock will be stopped.

Syntax:

AT+CCLK=<date and time string>

Parameters:

<date and time string> is a string with the following format: "yy/MM/dd,hh:mm:ss"
Valid years are 00 (for 2000) to 99 (for 2099).
The seconds field is not mandatory.

Command example	Possible responses	Note
AT+CCLK="00/06/09, 17:33:00"	OK	Set date to June 9th, 2000, and time to 5:33pm
AT+CCLK="00/13/13, 12:00:00"	+CME ERROR 3	Incorrect month entered
AT+CCLK?	+CCLK: "00/06/09, 17:34:23" OK	Current date is June 9th, 2000, time is also reported

+CALA – Alarm Management

Description:

This command is used to set alarms date/time in the ME.
The maximum number of alarms is 16.
Seconds are not taken into account.

Syntax:

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

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

Parameters:

<date and time string> is a string with the following format: "yy/MM/dd,hh:mm:ss" see +CCLK

<index> is a number from 1 to 16.

Command example	Possible responses	Note
AT+CALA="00/06/09, 07:30"	OK	Set an alarm for June 9th, 2000 at 7:30 am, Alarm stored
AT+CALA="99/03/05, 13:00:00"	+CME ERROR 3	Invalid alarm (date/time expired)
AT+CALA?	+CALA: "00/06/08,15:25:00",1 +CALA: "00/06/09,07:30:00",2 +CALA: "00/06/10,23:59:00",3	List all alarms Note: three alarms are set (index 1, 2, 3)
	+CALA: "00/06/08,15:25:00",1	An alarm occurs (index 1)
AT+CALA="",2	OK	Delete alarm index 3
AT+CALA?	+CALA: "00/06/09,07:30:00",1	List all alarms, Only one alarm (index 2)

+CSIM – Generic SIM Access:

Description:

This command allows a direct control of the SIM by a distant application on the TE. The <command> is sent without any modification to the SIM. In the same manner the SIM <response> is sent back by the ME as it is.

The user shall then take care of processing SIM information within the frame specified by GSM as specified in GSM 11.11 (or 3GPP TS 51.011).

If operation mode is not allowed by the ME, +CME ERROR: <error> is returned.

Between two successive +CSIM commands, there is no locking of the interface between the SIM and the GSM application. Since in this situation some command types and parameters can modify wrong SIM's files, some operations, described below, are not allowed for CSIM command. However, it is possible to process them with the CRSM command.

Syntax:

AT +CSIM=<length>,<command>

Response:

+CSIM: <length>, <response>
+CME ERROR: <err>

Parameters:

<length> Integer type. Length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response). For command sent to TE, This value must be in the range [10 – 522 else a CME_ERROR=3 is returned.

<command> Hexadecimal type. Command passed on by the MT to the SIM in the format as described in GSM 11.11 (or 3GPP TS 51.011) (hexadecimal character format; refer +CSCS)

Second Byte Value not supported:

Due to the absence of locking, a CME_ERROR=3 is returned for the following instructions (See CRSM commands):

D6	UPDATE BINARY
DC	UPDATE RECORD
32	INCREASE
44	REHABILITATE
04	INVALIDATE
88	RUN GSM ALGORITHM
20	VERIFY CHV
24	CHANGE CHV
26	DISABLE CHV
28	ENABLE CHV
2C	UNBLOCK CHV
FA	SLEEP
C0	GET RESPONSE

Second Byte Value warning:

Due to the absence of locking, the right response may not be returned for the following instructions (See CRSM commands).

C2	ENVELOPE
A2	SEEK
A4	SELECT

Fifth Byte Value Restriction:

For the following instructions (Second Byte):

A4	SELECT
10	TERMINAL PROFILE
C2	ENVELOPE
14	TERMINAL RESPONSE

The user must make sure that the value of the fifth Byte of the instruction corresponds of the length of bytes (data starting from 6th byte) which follow it.

The value of the Fifth Byte must be equal of the value: <length>/2 – 5, else the command is not send to the SIM and CME ERROR=3 is returned.

<error> integer type

3: Wrong format or parameters of the command

13: SIM no response

<response> Hexadecimal type.

Response to the command passed on by the SIM to the MT in the format as described in GSM 11.11 (or 3GPP TS 51.011) (hexadecimal character format; refer +CSCS)

Command example	Possible responses	Note
AT +CSIM?	OK	
AT +CSIM=?	OK	

+CRSM – Restricted SIM access

Description:

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. This command transmits to the MT the SIM <command> and its required parameters.

As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1 > and <sw2> parameters.

As for the CSIM command, there is no locking between two successive commands. The user should be aware of the precedence of the GSM application commands to the TE commands.

Syntax:

AT +CRSM=<command>[<fileid>[<P1 >,<P2>,<P3>[<data>]]]

Response:

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

+CME ERROR: <err>

Parameters:

<command> Integer type.

Command passed on by the MT to the SIM; refer GSM 11.11 (or 3GPP TS 51.011):

176:	READ BINARY
178:	READ RECORD
192:	GET RESPONSE
242:	STATUS

all other values are reserved and the command will return +CME ERROR=3

NOTE 1:

The MT internally executes all commands necessary for selecting the desired file, before performing the actual command.

<fileid> Integer type.

This is the identifier of a elementary datafile on SIM. Mandatory for every command except STATUS.

NOTE 2:

The range of valid file identifiers depends on the actual SIM and is defined in GSM 11.11 (or 3GPP TS 51.011). Optional files may not be present at all. This value must be in the range [0 – 65535] else a CME_ERROR=3 is returned.

<P1>, <P2>, <P3> Integer type.

Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 11.11 (or 3GPP TS 51.011).

<data> Hexadecimal type

Information which shall be written to the SIM (hexadecimal character format; refer +CSCS).

<sw1>, <sw2> Integer type

Information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command.

<response> Hexadecimal type

Response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer GSM 11.11 (or 3GPP TS 51.011)). After READ BINARY or READ RECORD command the requested data will be returned.

<error> Integer type

3: Wrong format or parameters of the command

13: SIM no response

Command example	Possible responses	Note
AT +CRSM?	OK	
AT +CRSM=?	OK	

+CMEC – Mobile equipment control mode

Description:

This command sets ME indicators. If operation mode is not allowed by the ME, +CME ERROR: <err> is returned

Syntax:

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

Response syntax:

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

Parameters:

<keyp>

reserved

<disp>

reserved

<ind>

0: only ME can set the status of its indicators (command +CIND can only be used to read the indicators)

1: only TE can set the status of ME indicators (with command +CIND)

2: ME indicators can be set by both ME and TE

Command example	Possible responses	Note
AT+CMEC?	+CMEC: 2,0,0 OK	
AT+CMEC=?	+CMEC: (2),(0),(0) OK	no change allowed

+CIND – Indicator control

Description:

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

Syntax:

AT+CIND=[<ind>[,<ind>[,. . .]]]

Response syntax:

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

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

Parameters:

<ind> integer type

Value, which shall be in range of corresponding **<descr>**

0: indicator is OFF or in state that can be identified as "OFF" state

1: indicator is ON or in a state that is more substantial than "OFF" state

2: this value is more substantial than 1, and so on.

NOTE:

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

<descr>

"battchg":	battery charge level (0 – 5), not relevant
"signal":	signal quality (0 – 5)
"service":	service availability (0 – 1)
"message":	message received (0 – 1)
"call":	call in progress (0 – 1)
"roam":	roaming indicator (0 – 1)
"smsfull":	SMS memory storage status in the MT (0 – 1)
	0: memory locations are available
	1: memory full
	2: one SMS has been received in Service Center (SC) but the SMS storage where this SMS tried to be stored is full.

Command example	Possible responses	Note
AT+CIND?	+CIND: 1,2,1,1,0,0,0 (a SMS has been received),	battchg:1 (level 1 of 5), signal:2 (level 2 of 5), service:1 (we are registered on the network), message:1 call:0 – no call in progress, roam:0 – not roaming, smsfull:0 – SIM card is not full of SMS
AT+CIND=?	+CIND: ("battchg",(0-5)), ("signal",(0-5)), ("service",(0-1)), ("message",(0-1)), ("call",(0-1)), ("roam",(0-1)),("smsfull",(0-1)) OK	Read ME indicators possible values

Call Control commands

D and DL – Dial command

Description:

The ATD command is used for data or fax call. As per GSM 02.30, the dial command also controls supplementary services.

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

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

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

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). A voice call must be used when sending DTMF tones.

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

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

Example: to set up a data call to the Westermo Sweden office from another country, the AT command is: **ATD+4616428000**

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

The ATDL command dials the last valid dialled number.

Direct dialling from a phonebook (stored in the SIM card)

Direct dialling can be performed with the following command:

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

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

ATD> mem <index> (mem is "SM","LD","MC","ME","RC","MT" or "SN", see +CPBS command) allows direct dialling from a phonebook number. Does not function with "ON" mem.

Syntax:

ATD<nb>[<I>][;]

ATD>[<mem>]<index>[<I>][;]

ATD>[<mem>]<name>[<I>][;]

Response:

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 find out the failure cause

Parameters:

<nb> is the number to dial.

<I> (optional parameter)

"I" – "invocation" (restrict CLI presentation)

"i" – "suppression" (allow CLI presentation)

<mem>

Phonebook (one of "SM", "LD", "MC", "ME", "RC", "MT" or "SN"). A default value can be selected by +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.

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

Command specific information

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.

GSM sequences

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 there are written in the FDN.

Example of using GSM sequences:

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

See appendix for the list of supported sequences.

H – Hang-Up command

Description:

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

Syntax:

ATH<n>

Parameters:

<n>

0: Ask for disconnection

1: Ask for outgoing call disconnection

Command example	Possible responses	Note
ATH	OK	Ask for disconnection, Result: every call, if any, are released
ATH1	OK	Ask for outgoing call disconnection, Result: Outgoing call, if any, is released

A – Answer a call

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.

Syntax:

ATA

Parameters:

No parameters

Command example	Possible responses	Note
	RING	Incoming call
ATA	CONNECT	Answer to this incoming call, call accepted
ATH	OK	Disconnect call OK, call disconnected

+CEER – Extended error report

Description:

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

Syntax:

AT+CEER

Parameters:

No parameters

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

For the cause information element from GSM 04.08 see further in this manual. "NO CARRIER" indicates that the AT+CEER information is available for failure diagnosis.

+VTD, +VTS – DTMF signals

+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).

+VTD Syntax:

AT+VTD=<n>

+VTD Parameters:

<n> 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.

Value different than zero causes a tone of duration <n>*100 milliseconds.

Value zero (default value) causes a tone duration of 70 ± 5 ms.

Note: The value is used modulo 256.

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

+VTS Description:

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

+VTS Syntax:

AT+VTS=<Tone>

+VTS Parameters:

<Tone> is in {0-9,*,#,A,B,C,D}.

Command example	Possible responses	Note
AT+VTS=A	OK	Command valid
AT+VTS=11	+CME ERROR: 4	If the <Tone> is wrong
AT+VTS=4	+CME ERROR: 3	If there is no communication
AT+VTS=1;+VTS=3;+VTS=#	OK	To send tone sequence 13#

AT%Dn – Automatic dialing/sending with DTR

Description:

This command enables and disables

- automatic dialling of the phone number stored in the first location of the ADN phonebook,
- automatic sending of the short message (SMS) stored in the first location of the SIM.

The number is dialled when DTR OFF switches to ON.

The short message is sent when DTR OFF switches to ON.

Syntax:

AT%D<n>[;]

Parameters:

<n> = {0, 1, 2}

0: Disables automatic DTR number dialling / message transmission.

1: Activates automatic DTR dialling if DTR switches from OFF to ON; Dials the phone number in the first location of the ADN phonebook. Data or Fax call.

2: Activates automatic DTR short message transmission if DTR switches from OFF to ON.

; Indicates that a voice call is made if DTR changes from OFF to ON.

Command example	Possible responses	Note
AT%D1;	OK	Activates DTR number dialling
DTR is OFF		
DTR switches ON	CONNECT	The number in the first location of the ADN is dialled automatically
DTR switches OFF		The product goes off-hook
AT%D2	OK	Activates DTR short message sending

If the first location is empty:

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

+CICB – Incoming Call Bearer

Description:

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

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

Syntax:

AT+CICB=<mode>

Parameters:

<mode>

0: Data

1: Fax

2: Speech

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

+CSNS – Single Numbering Scheme

Description:

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

NOTE: *setting the +CSNS command affects the current value of +CICB.*

Syntax:

AT+CSNS=<mode>

Parameters:

<mode>

0: Voice

2: Fax

4: Data

Command example	Possible responses	Note
AT+CSNS=2	OK	Force a fax call
AT+CSNS=0	OK	Force a voice call
AT+CSNS?	+CSNS: 0	Interrogate value, incoming bearer: voice call
AT+CSNS=?	+CSNS: (0,2,4)	Test command,-Voice, data or fax default incoming bearer

Network service commands

+CSQ – Signal Quality

Description:

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

Syntax:

AT+CSQ

Response syntax:

+CSQ: <rssi>,<ber>

Parameters:

<rssi>

0: –113 dBm or less

1: –111 dBm

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

Command example	Possible responses	Note
AT+CSQ	+CSQ: 21, 0 OK	RSSI: 21 and BER: 0

+COPS – Operator selection

Description:

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

- 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 one communication.

Syntax:

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

Responses Syntax

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

Response syntax for AT+COPS?:

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

Response syntax for AT+COPS=?:

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

CME ERROR: 546	Emergency call is not allowed without SIM
CME ERROR: 547	Emergency call

NOTE:

-Error code CME ERROR: 546 or CME ERROR: 547 are only returned if SIM is not present

-The fact that network support emergency call (CME ERROR: 547) does not imply that emergency call without SIM is working.

NOTE:

- 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.

Parameters:

<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>

0: long alphanumeric format <oper>

1: short alphanumeric format <oper>

2: numeric <oper> (default value) <stat> status of <oper>

<stat>

0: unknown

1: available

2: current

3: forbidden

<oper>

Operator identifier (MCC/MNC in numeric format only for operator selection). The long alphanumeric format can be up to 16 characters long (see appendix 18.12 for operator names description, field is "Name"). The short alphanumeric format can be up to 8 characters long.

Command example	Possible responses	Note
AT+COPS?	+COPS: 0,2,20801 OK	Ask for current PLMN, reported PLMN is France Telecom Orange
AT+COPS=?	+COPS: (2,"F Itinéris","Itline", "20801"), (3,"FSFR","SFR", "20810") OK	Ask for PLMN list, Home PLMN is France Telecom, SFR network has been detected
AT+COPS=1,2,20810	+CME ERROR: 32	Ask for registration on SFR network, Network not allowed – emergency calls only
AT+COPS=1,1,23433	+CME ERROR: 529	Ask for registration on UK Orange network Selection failed – emergency calls only
AT+COPS=0	OK	Register on home network, Succeeded
AT+COPS=3,0	OK	Set <format> to long alpha-numeric
AT+COPS?	+COPS: 0,0,"Orange F" OK	Ask for current PLMN, Home PLMN is France Telecom Orange
AT+COPS=2	OK	Request deregistration from network
AT+COPS?	+COPS: 2	Ask for current PLMN **Note**: ME is unregistered until <mode>=0 or 1 is selected.

+CREG – Network registration

Description:

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

Syntax:

AT+CREG= <mode>

Response Syntax

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

Parameters:

<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>

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.

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

AT+WOLM – Operator List Management.

Description:

This command allows a new or modified operator to be added to the PLMN list.
At most 10 PLMN 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 one will be taken into account to have the name.

Syntax:

AT+WOLM=<mode>,<loc>[,<NumOper>,<short name>,<long name>]

Response Syntax:

AT+WOLM?

+WOLM: <loc>,<NumOper>,<short name>,<long name>

+WOLM: ...

Parameters:

<mode>

0:	delete
1:	write
2:	read

<loc>

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

<NumOper>

Operator in numeric format.

<short name>

The short name of the PLMN.

<NumOper>

The long name of the PLMN.

Command example	Possible responses	Note
AT+WOLM=1,1,20812, ”WM”,”WM PLMN”	OK	Add a new PLMN at location 1
AT+WOLM=2,1	+WOLM: 1,20812, ”WM”,”WM PLMN” OK	Read the PLMN at location 1
AT+WOLM=2,11	+CME ERROR: 21	Read the PLMN at location 11, invalid index
AT+WOLM=1,1,20812, ”WM1”,”WM1 PLMN”	OK	Modify an existing PLMN
AT+WOLM?	+WOLM: 1,20812, ”WM1”,”WM1 PLMN” OK	Interrogate current list.
AT+WOLM=1,1,20812, ”PLMN2”,”PLMN2 LONG”	OK or +CME ERROR: 20	Add a new PLMN at available location. Error is returned if no more PLMNs can be created
AT+WOLM=0,1	OK	Delete entry at location 1
AT+WOLM=0,11	CME ERROR: 21	Try to delete an invalid index.

+WOPN – Read operator name

Description:

This command returns the operator name in alphanumeric format when given the numeric format.

With 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 permits to erase NITZ PLMN names stored in Flash memory with "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 message is created in flash memory. These names will then be used with +COPS,+COPN,+WOPN commands with the priority order defined in 3GPP TS 22.101. The modem supports only network names with GSM default alphabet coding scheme.

The user can choose which of the following method will be used for getting PLMN names with 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 (0x6F46) for Long Name if present (if not, reuse SIM file CPHS ONS)
3 – SPN	If on home PLMN, use SIM file SPN (0x6F46) if present.
4 – NITZ	If there's a matching entry in the list of names received so far use it. Note that in France for example, all the operators use NITZ message for date and time feature, but not for PLMN names, so the list is always empty. In France, NITZ message is sent on GPRS attachment. If there's a matching entry in flash PLMN list (created by +WOLM), use it.
5 – ROM	PLMN names in ROM defined according to MoU SE.13 and NAPRD Operator Names documents.

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

Refer to 3GPP TS 24.008 V5.3.0, 3GPP TS 23.040 v6.1.0, 3GPP TS 22.042 v5.0.0 for more information.

Syntax:

AT+WOPN=<mode>, <NumOper> [, <lac>]

Response syntax:

WOPN: <mode>, <AlphaOper>

Parameters:

<mode>

0: use long alphanumeric format
1: use short alphanumeric format
2: reserved for later use
3: Erase NITZ PLMN list if <NumOper> = 0
4: Acces to EEPREOM to read or write the method used 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 is shirt alphanumeric format (see codes and values for operator names description)

<lac>

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

<lmnOns>

Is a bit field with following coding:

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

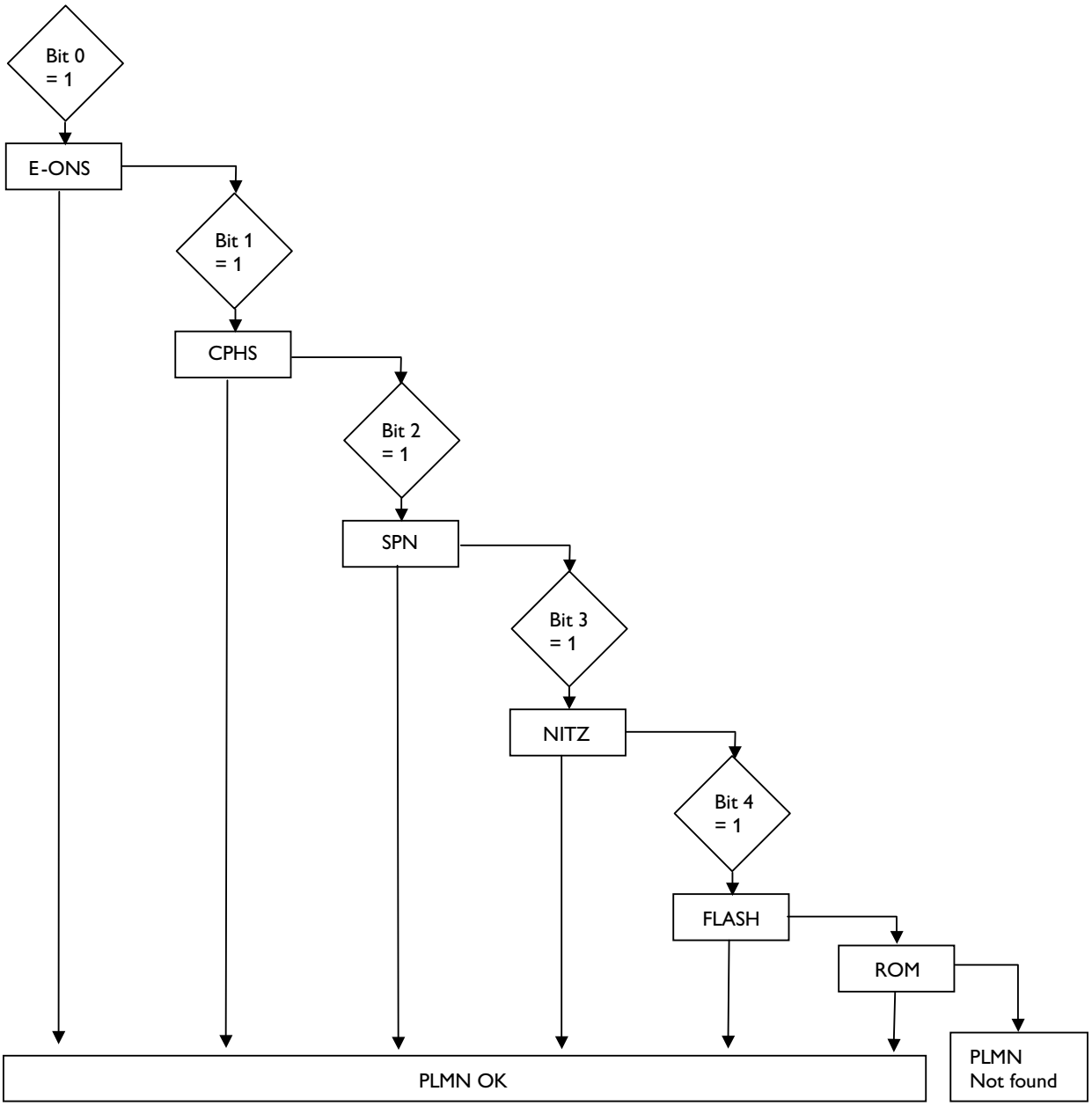
Bit 4 (FLASH)	Bit 3 (NITZ)	Bit 2 (SPN)	Bit 1 (CPHS)	Bit 0 (E-ONS)

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

1	1	1	4	1

NOTE: for example <PlmnONs>=31 means that the four methods will be used for PLMN names (bit field value is 1111 of 0x1F)

Operation flow for field PlmnOns



Command example	Possible responses	Note
AT+WOPN=?	OK	Possible responses
AT+WOPN=0,20801	+WOPN: 0,"Orange F" OK	Give operator in numeric format
AT+WOPN=0,99999	CME ERROR 22	Wrong operator number gives error
AT+WOPN=0,20801,36	+WOPN: 0,"Orange F" OK	Give an operator in numeric format for lac 36
AT+WOPN=3,0	OK	Erase NITZ PLMN names stored in flash memory
AT+WOPN=4	+WOPN: 31 OK	Read from EEPROM which method will be used for PLMN names
AT+WOPN=4,<PlmnOns>	OK	Write to EEPROM which method will be used for PLMN names

+CPLS – Selection of Preferred PLMN list

Description:

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

Syntax:

AT +CPLS= <List>

Parameters:

<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

Command example	Possible responses	Note
AT +CPLS?	+CPLS: 1 OK	EF_OPLMNwAct is selected
AT+CPLS=0		If EF_PLMNwAct is not present, EF_PLMNsel vvill be selected
AT +CPLS=1	+CME ERROR: 3	EF_OPLMNwAct is not present
AT +CPLS=?	+CPLS: (0,1,2) OK	The 3 files with Acces technology are present and can be selected
AT +CPLS=?	+CPLS: (0) OK	Only EF_PLMNvvAct or EF_PLMNsel can be selected

+CPOL – Preferred operator list

Description:

This command is used to edit (or update) the SIM preferred list of networks. This list is read in the SIM file selected by the command AT +CPLS.

Syntax:

AT +CPOL= [< index>][,<format>[,<oper>[,<GSM_AcT>,<GSMcomp_Act>,<Utran_Act >]]]

Parameters:

<index>

position of the operator record in the sim preferred operator list. Do AT+CPOL=? to get the maximum index of the selected EF.

<format>

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>

0: GSM access technology not selected

1: GSM access technology selected

<GSMcomp_Act>

0: GSM compact access technology not selected

1: GSM compact access technology selected

<Utran_Act>

0: UTRAN access technology not selected

1: UTRAN access technology selected

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>,< Utra n _ 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 choosen.

The supported format are those of the +COPS command.

The length of this list is limited to 85 entries for EF_PLMNsel, and 51 for EF_PLMNvvAct, EF_OPLMNvvAct, EF_HPLMNvvAct

Command example	Possible responses	Note
AT+CPOL?	+CPOL:1,2,26201 +CPOL: 6,2,20810 OK	Ask for preferred list of networks With only EF_ PLMNsel present. Preferred list of networks in numeric format (read in EF_ PLMNsel)
AT+CPOL?	+CPOL: 1,2,26201,1,0,0 +CPOL: 6,2,20810,1,0,0 OK	Ask for preferred list of networks. With EF_PLMNwAct selected and present. Preferred list of networks in numeric format (read in EF_PLMNwAct. GSM acces technology selected GSM compact acces technology not selected Utran acces technology not selected
AT+CPOL=,0	OK	Select long alphanumeric format
AT+CPOL?	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” OK	Ask for preferred list of networks. With only EF_PLMNsel present. Preferred list of networks in long alphanumeric format
AT+CPOL=7,2,20801	OK	Add a network to the list
AT +CPOL?	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 7,0,"Orange F" OK	Ask for preferred list of networks With only EF_ PLMNsel present Preferred list of networks in long alphanumeric format
AT+CPOL=7	OK	Delete 7'h location

Command example	Possible responses	Note
AT+CPOL?	+CPOL: 1,0,”D1-TELEKOM” +CPOL: 6,0,”F SFR” OK	Ask for preferred list of networks With only EF_ PLMNsel present Preferred list of networks in long alphanumeric format
AT+CPOL=8,2,77777	OK	Add a network to the list With only EF_PLMNsel present.
AT+CPOL=8,2,77777,0,0,1	OK	Add a network to the list with EF_PLMNwact present. Acces technology UTRAN is selected
AT+CPOL=8,2,77777	OK	Add a network to the list with EF_PLMNwact present. Per default Acces technology GSM is selected
AT+CPOL?	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,”F SFR” +CPOL: 8,2,7777 OK	Add a network to the list With only EF_PLMNsel present. Preferred list of networks in long alphanumeric format but 8th entry is unknown so the product edits it in the numeric format
AT+CPOL=9,0,”Orange F”	OK	Add a new network to the list (text format)
AT+CPOL?	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,”F SFR” +CPOL: 8,2,7777 +CPOL: 9,0,”Orange F” OK	Add a network to the list With only EF_PLMNsel present. Preferred list of networks in long alphanumeric format
AT+CPOL=?	+CPOL: (1-16),(0,2) OK	The EF can accept 16 records and supported format are 0,1 or 2

+COPN – Read operator name

Description:

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

Syntax:

AT+COPN

Response Syntax:

+COPN: <NumOper>.<AlphaOper>

Parameters:

<NumOper>

is the operator in numeric format.

<AlphaOper>

is the operator in long alphanumeric format (see operator names description) List in the end of this document.

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

Security commands

+CPIN – Enter PIN

Description:

This command is used to enter 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.

Syntax:

AT+CPIN=<pin>

AT+CPIN=<puk>,<new pin>

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>

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

AT+CPIN?

Response Syntax:

+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.

NOTE:

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.

Parameters:

<pin>

Personal Identification Number, 4 digits number.

<puk>

Personal Unblocking Key needed to change the PIN, eight digits number.

Command example	Possible responses	Note
AT+CPIN=1234	OK	Enter PIN, result: PIN code is correct
AT+CPIN=5678	+CME ERROR : 3	Enter PIN, Operation not allowed, PIN previously entered
AT+CPIN=00000000,1234	+CME ERROR: 16	Enter PUK and new PIN, result: Incorrect PUK
AT+CPIN=12345678,1234	OK	Enter PUK and new PIN, 2nd attempt, PUK correct, new PIN stored
3 failed PIN validations + 1 successful PUK validation:		
AT+CPIN?	+CPIN: SIM PIN	Read the PIN status The product requires SIM PIN
AT+CPIN=1235	+CME ERROR: 16	First attempt to enter a SIM PIN, Wrong PIN
AT+CPIN=1236	+CME ERROR: 16	Second attempt, Wrong PIN
AT+CPIN=1237	+CME ERROR: 16	Third attempt, Wrong PIN
AT+CPIN?	+CPIN: SIM PUK	Read PIN state, The product requires PUK
AT+CPIN=99999999,5678	OK	The PUK is entered, the new PIN shall be 5678 PUK validation is OK. New Pin is 5678
AT+CPIN?	+CPIN: READY	Read PIN state, 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 dialling phonebook (FDN), so if SIM PIN2 authentication has not been performed during the current session, SIM PIN2 is required.

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

NOTE:

The modem will only request PIN2 or PUK2 once. Therefore, if they are not entered properly, the next +CPIN? command will return “+CPIN: READY”.

+CPIN2 – Enter PIN2

Description:

This specific command is used to validate the PIN2 code (CHV2), or to validate the PUK2 code (UNBLOCK CHV2) and to define 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.

Syntax:

AT+CPIN2=<pin2>

AT+CPIN2=<puk2>,<NewPin2>

After 3 unsuccessful attempts, PUK2 will then 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 therefore uses the "AT+CPIN2=<puk2 >,<NewPin2> "command syntax.

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

AT+CPIN2?

Response Syntax:

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

Command example	Possible responses	Note
AT+CPIN2=1234	OK	Enter PIN2, code is correct
AT+CPIN2=5678	+CME ERROR: 3	Enter PIN2, Operation not allowed, PIN2 previously entered
AT+CPIN2=00000000,1234	+CME ERROR: 16	Enter PUK2 and new PIN2, Incorrect code (PUK2)
AT+CPIN2=12345678,1234	OK	Enter PUK2 and new PIN2, 2nd attempt PUK2 correct, new PIN2 stored

+CPINC – PIN remaining attempt number

Description:

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

Syntax:

AT+CPINC

Response Syntax

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

Parameters:

<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)

If the card is not present at the time of initialization, +CME ERROR:10 will be sent.

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

+CLCK – Facility lock

Description:

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

NOTE

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

Syntax:

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

Response syntax:

+CLCK: <status> [,<class1>]

+CLCK: <status>[,<class2> [. . .]]

Parameters:

<fac>

Supported facilities:

"PS" SIM lock facility with a 8 digits password.

"SC" PIN enabled (<mode> = 1) / disabled (<mode> = 0)

"AO" BAOC (Barr All Outgoing Calls)

"OI" BOIC (Barr Outgoing International Calls)

"OX" BOIC-exHC (Barr Outgoing. International Calls except to Home Country)

"AI" BAIC (Barr All Incoming Calls)

"IR" BIC-Roam (Barr Incoming When Roaming outside Home Country)

"AB" All Barring services

"AG" All outGoing barring services

"AC" All inComing barring services

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

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

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

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

"FD" SIM Fixed Dialling Numbers (FDN) memory feature (PIN2 is required as <password>)

<mode>

0: unlock the facility

1: lock the facility

2: query status

<class>

1: Voice (telephony)

2: Data (apply to all bearer services)

4: Fax (facsimile 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, data and fax.

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

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

NOTE

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

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

+CPWD – Change password

Description:

This command is used by the application to change a password (PIN, call barring, NCK, etc.). The facility values <fac>) are the same as for the +CLCK command with a "P2" facility to manage SIM PIN2. For the network lock ("PN"), unlocking is forbidden after 10 failed attempts to disable (unlock) the network lock with an incorrect password.

Syntax:

AT+CPWD= <fac>, <oldpwd>, <newpwd>

Parameters:

<fac>

"PS" SIM lock facility with a 8 digits password.

"SC" PIN enabled (<mode> = 1) / disabled (<mode> = 0)

"AO" BAOC (Barr All Outgoing Calls)

"OI" BOIC (Barr Outgoing International Calls)

"OX" BOIC-exHC (Barr Outgoing. International Calls except to Home Country)

"AI" BAIC (Barr All Incoming Calls)

"IR" BIC-Roam (Barr Incoming When Roaming outside Home Country)

"AB" All Barring services

"AG" All outGoing barring services

"AC" All inComing barring services

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

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

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

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

"P2" SIM PIN2

<oldpwd>, <newpwd>

4 or up to 8 or 16 digits according to the facility.

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

*WPIN – Auto PIN Code

Description:

This command configures the modem to automatically control the SIM PIN code. The command can be used when it’s impossible to disable SIM PIN code check in the SIM card or when the PIN check needs to be enabled for any other reason. Since the PIN code is stored in flash memory, the modem will send the PIN code to the SIM automatically when it is requested.

Syntax:

AT*WPIN=<mode>, <PIN_code>

Parameters:

<mode>

0: Disable automatic PIN code control

1: Enable automatic PIN code control

<PIN_code>

The SIM PIN code. A string of 4 numerical digits.

Command example	Possible responses	Note
AT*WPIN=1,”1234”	OK	Enable the autopin mode with the PIN code: 1234
AT*WPIN?	*WPIN: 1,”1234”	Current value
AT*WPIN =?	*WPIN: (mode, “PIN code”)	Test command

See also the +CPIN and +CLCK command for more information.

Phonebook commands

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

General Phonebook 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_Fax> Fax 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_Fax>**, **<num_Data>**, **<Email>** and **<Address>** will be represented by **<Contact>** in the rest of this document.

So, the extended structure can be represented by:

<num_Home> Home phone number

<Name> Name

<Contact> Contact Structure

<Phb_Group> Phonebook group

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

Phonebook groups parameter definition

<index> Group index

<name> Group name

<phb_entry_index> Phonebook entry index

<restrict call> Restrict call mode for incoming calls

+CPBS – Select phonebook memory storage

Description:

This command selects phonebook memory storage.

Syntax:

AT+CPBS=<pb>

Parameters:

<cb>

"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 ME)

"LD": LND Last Number Dialed

"MC": ME missed (unanswered received) calls list

"ME": ME phonebook

"MT": combined ME and SIM phonebook (ME+SM)

"RC": ME received calls list

"SN": SDN Service Dialing Numbers (SIM special service numbers)

NOTE:

The following emergency numbers are stored in E2P:

- 112
- 911
- 999
- 08

So, "EN" will be available even if ECC SIM file is not present.

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

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

+CPBR – Read phonebook entries

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 was used, the response will include <Contact> structure

Syntax:

AT+CPBR=<first_entry>[,<last_entry>]

Response Syntax:

The entry is stored in the ADN phonebook and AT+WCOS=0

+CPBR: <loc>,<num>,<type>,<name>

[+CPBR: <loc>,<num>,<type>,<name>[...]]

The entry is stored in the ADN phonebook and AT+WCOS=1

+CPBR: <loc>,<num>,<type>,<name>,<Phb_group>

[+CPBR: <loc>,<num>,<type>,<name>,<Phb_group> [...]]

The entry is stored in the ME phonebook and AT+WCOS=0:

+CPBR: <loc>,<num>,<type>,<name>

[+CPBR: <loc>,<num>,<type>,<name>[...]]

The entry is stored in the ME phonebook and AT+WCOS=1

+CPBR: <loc>,<num>,<type>,<name>,<Contact>,<Phb_group>

[+CPBR: <loc>,<num>,<type>,<name>,<Contact>,<Phb_group> [...]]

Parameters:

<first_entry>, <last_entry>

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

<type>

Type of address byte in integer format. Value is 145 if the dialling string (<number> response value) includes access code character '+', else value is 129.

Command example	Possible responses	Note
AT+CPBR=?	+CPBR: (1-50),20,10 OK	50 locations (from 1 to 50), max length for phone number is 20 digits, 10 characters max for the text
AT+WCOS?	+WCOS: 0 OK	Contact not selected
AT+CPBR=12,14	+CPBR: 12,"112",129,"Emergency" +CPBR: 13,"+331290909", 145,"Fred" +CPBR: 14,"0146290808",129, "Zazi" OK	Read entries from 12 to 14. Display locations 12,13,14 with location, number, type (TON/NPI), Text
AT+CPBR=10	+CPBR: 10,"0146290921",129, "Rob" OK	Display location 10
AT+CPBR=11	+CPBR: 11,"0146290921",129, "8000010002FFFF" OK	Read entry 11 (UCS2 format). Display location 11
AT+CPBR=52	+CME ERROR: 21	Read entry 52 (wrong) Invalid index
AT+CPBS="ME"	OK	Select Flash memory
AT+CPBR=13	+CPBR: 13,"+331290909", 145,"Fred", "0141284549", 129, "0600003210", 129, "0141280000", 129, "019876543210", 129, "fred@mail_address.com", "Becker Street London",1 OK	Display locations 13 with location, number, type (TON/NPI), Text and Contact and Phonebook Group no.
AT+CPBS="SM"	OK	Select ADN phonebook
AT+CPBR=1	+CPBR=1,"0123456",129,"test" OK	
AT+CPBW=1,"0123456",, "test",1	OK	Add an extended entry in SIM with group number (1)
AT+CPBR=1	+CPBR=1,"0123456",129,"test",1 OK	

+CPBW – Write phonebook entry

Description:

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

NOTE:

"RC" and "MC" phonebooks could be only erased by +CPBW. Adding field and/or modifying field is not allowed for these phonebooks.

This command is not allowed for "EN", "LD", "MC", "RC", "MT", "SN" phonebooks, which can not be written.

If the AT+WCOS=1 command was used, the request would include the 'Contact' structure.

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 ME phonebook with AT+WCOS=0

AT+CPBW=<index>[,<number>[,<type>[,<text>]]]

For ME phonebook with AT+WCOS=1

AT+CPBW=<index>[,<number>[,<type>[,<text>[,<Contact> [,<Phb_group>]]]]]

Parameters:

<index>

Integer type value depending on the capacity of the phonebook memory.

0: value deletes all entries of the current phonebook (selected with +CPBS command)

NOTE:

To delete all entries of the current phonebook, +WCOS parameter must be different from 0, elsewhere a +CME ERROR: 21 (invalid index) will be returned.

<number>

Phone number in ASCII format.

<type>

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

NOTE:

Value is 145 if the dialing string (<number> response value) includes the international access code character '+', else value is 129 (ex: a <type> value of 17 will be written as 145).

<text>

string type. Maximum length of <text> field is:

- For the ME phonebook, 30 ASCII characters.
- For the ADN phonebook: SIM dependant (use AT+CPBW=?)

NOTE;

- 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.

Range of value is 1 to 10. If the entry must not be saved in a group, <Phb_Group> = 0 or can be omitted.

Command example	Possible responses	Note
AT+CPBS=”SM”	OK	Select ADN phonebook
AT+CPBS?	+CPBS:”SM”,1,10 OK	Which phonebook is selected ?
AT+WCOS=0	OK	Phonebook not extended
AT+CPBW=?	+CPBW: (1-50),20, (129,145),10 OK	50 locations, phone number = 20 digits max, TON/NPI of 129 or 145, text length = 10
AT+CPBW=5,”112”, 129,”SOS”	OK	Location 5 written
AT+CPBR=5	+CPBR: 5,”112”,129,”SOS”	Read the entry at location 5
AT+CPBS?	+CPBS:”SM”,2,10 OK	ADN phonebook is selected, 2 locations are used and 10 locations are available
AT+CPBW=5,”01290917”, 129,”Jacky”	OK	Location 5 overwritten
AT+CPBW=6,”01292349”, 129,”8000410042”	OK	write location 6 (UCS2 format for the <text> field)
AT+CPBW=8,”01292349”, 129,”80xyz”	OK	Location 8 is written. The string has a wrong UCS2 format, it is therefore considered as an ASCII string
AT+CPBW=5,”01290917”, 129,”Jacky”,1	+CME ERROR: 3	Write an extended entry, Error because +WCOS: 0
AT+WCOS=1	OK	Phonebook extended
AT+CPBW=5,”01290917”, 129,”Jacky”,1	OK	Write an extended entry
AT+WCOS=0	OK	Phonebook not extended
AT+CPBS=”ME”	OK	Select ME phonebook
AT+CPBS?	+CPBS: “ME”,2,500	ME phonebook is selected, 2 locations are used and 500 locations are available
AT+CPBW=1,”0123456798”, 129,”first entry”	OK	Write an not extended entry
AT+CPBR=1	+CPBR: 1,”0123456798”,129,”first entry”	Read the first entry
AT+ WCOS=1	OK	Phonebook extended
AT+CPBW=1,”0123456798”, 129,”first entry”	OK	Write an entry not extended

Command example	Possible responses	Note
AT+CPBW= 2,"9876543210",129,"second entry","6543210987",129	OK	Write an entry extended
AT+CPBR=1,2	+CPBR: 1,"0123456798",129," first entry"	Read entry 1 and 2
AT+CPBW=13," +331290909",145,"Fred", "0141284549",129," 0600003210",129," 0141280000", 129," 019876543210",129, "fred@mail_address.com", "Becker Street London",1	OK	**Note**: write location with Contact and Phonebook Group n°1 Location 13 is written
AT+CPBW=," +33145221100",145,"SOS"	OK	Write at the first location available
AT+CPBW=," 0345221100",129,"SOS"	+CME ERROR: 20	Write at the first location available Phonebook full
AT+CPBW=57 ,"112",129,"WM"	+CME ERROR: 21	Write at location 57 (wrong) Invalid index
AT+CPBW=7, "012345678901234567890", 129,"WAVE"	+CME ERROR: 26	Write at location 7 a phone number exceeding the limit (21 digits) Phone number too long
AT+CPBW=7, "0122334455",129, "WESTERMO TEL"	+CME ERROR: 24	Write at location 7 along text (11 characters) Text too long
AT+CPBS="SM"	OK	Select ADN phonebook
AT+WCOS?	+WCOS: 1 OK	Extended phonebook
AT+CPBR=1	+CPBR=1,"0123456",129,"test" OK	
AT+CPBW=1,"0123456", ,"test",1	OK	Add an extended entry in SIM with group number (1)
AT+CPBR=1	+CPBR=1,"0123456",129,"test",1 OK	

Command example	Possible responses	Note
AT+CPBW=13,” +331290909”,145,”Fred”, ”0141284549”,129, ”0600003210”, 129,”0141280000”, 129, ”019876543210”,129, “fred@mail_address.com”, “Becker Street London”,1	OK	Save the entry in the phonebook group #1
AT+CPBW=13,” +331290909”,145,”Fred”, ”0141284549”,129, ”0600003210”,129 ,”0141280000”, 129, ”019876543210”,129, “fred@mail_address.com”, “Becker Street London”		Save the entry without phonebook group
AT+CPBW=13, ”+331290909”,145, ”Fred”, ”0141284549”, 129,”0600003210”,129 ,”0141280000”, 129, ”019876543210”,129, “fred@mail_address.com”, “Becker Street London”,0	OK	Save the entry without phonebook group

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

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

+CPBF – Find phonebook entries

Description:

This command returns phonebook entries with alphanumeric fields starting with a given pattern. The AT+CPBF= “” command can be used to display all phonebook entries sorted in alphabetical order.

This command is not allowed for "LD", "RC", "MC", "SN" phonebooks and for the “EN” phonebook, which does not contain alphanumeric fields.

It is possible to use this command with UCS2 strings. If a wrong UCS2 format is entered, the string is considered as an ASCII string.

Syntax :

AT+CPBF=<string>

Response syntax:

The entry is stored in the ADN phonebook and AT+WCOS=0

+CPBF: <loc>,<num>,<type>,<name>

The entry is stored in the ADN phonebook and AT+WCOS=1

+CPBF: <loc>,<num>,<type>,<name>,<Phb_group>

The entry is stored in the ME phonebook and AT+WCOS=0

+CPBF: <loc>,<num>,<type>,<name>

The entry is stored in the ME phonebook and AT+WCOS=1

+CPBF: <loc>,<num>,<type>,<name>,<Contact>,<Phb_group>

Parameters:

<string>

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

<loc>

location number (20 digits max)

<num>

phone number (20 digits max)

<type>

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

<contact>

Extended contact structure

Command example	Possible responses	Note
AT+CPBF=?	+CPBF: 20,14 OK	Max length for phone number is 20 digits, 10 characters for the text
AT+CPBF="E"	+CPBF: 12,"112",129, "Emergency" +CPBF: 15,"+331290101", 145,"Eric" OK	Display locations with text field starting with "E"
AT+CPBF="H"	+CME ERROR: 22	Read entries with "H" No entry found
AT+CPBF="800001"	+CPBF: 11, "0146290921", 129, "8000010002FFFF" OK	Display locations with text field starting with 0001 UCS2 character
AT+CPBF="8045C"	+CME ERROR: 22	No entry found. The string has a wrong UCS2 format, it is therefore considered as an ASCII string
AT+CPBS="SM"	OK	Select ADN phonebook
AT+WCOS=0	OK	Phonebook not extended
AT+CPBF="Test"	+CPBF: 1,"0123456789",129 UCS2 character	Display locations with text field starting with "Test"
AT+WCOS=1	OK	Phonebook extended
AT+CPBF="Test"	+CPBF: 1,"0123456789",129, "Test ADN",0	Display locations with text field starting with "Test", extended entry
AT+CPBS="ME"	OK	Select ADN phonebook
AT+WCOS=0	OK	Phonebook not extended
AT+CPBF="Test"	+CPBF: 1,"0123456789",129, "Test ME"	Display locations with text field starting with "Test"
AT+WCOS=1	OK	Phonebook extended
AT+CPBF="Test"	+CPBF: 1,"0123456789",129, "Test ME", "9876543210", 129,"","","","","", e_mail@mail_address.com", "post address",0	Display locations with text field starting with "Test", extended entry

+CPBP – Phonebook phone search

Description:

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

The searched phone number is the FIRST one that a user can enter with AT+CPBW:

For example, with this enter, we can only search 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"

Syntax:

AT+CPBP=<PhoneNumber>

Response syntax:

The entry is stored in the ADN phonebook and AT+WCOS=0

+CPBP: <loc>,<num>,<type>,<name>

The entry is stored in the ADN phonebook and AT+WCOS=1

+CPBP: <loc>,<num>,<type>,<name>,<Phb_group>

The entry is stored in the ME phonebook and AT+WCOS=0

+CPBP: <loc>,<num>,<type>,<name>

The entry is stored in the ME phonebook and AT+WCOS=1

+CPBP: <loc>, <num>, <type>, <name>, <Contact>, <Phb_group>

Parameters:

<PhoneNumber>

Phone number (is coded like 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

Command example	Possible responses	Note
AT+CPBP=”+331290101”	+CPBP: 15,”+331290101”, 145,”Eric” OK	Display the entry corresponding to the specified phone number
AT+CPBP=”+331290101”	+CPBP: 15,”01290101”,129, ”Eric” OK	Display the entry corresponding to the specified phone number
AT+CPBP=”01290202”	+CPBP: 15,”+331290202”,145, ”David” OK	Display the entry corresponding to the specified phone number
AT+CPBP=”+331288575”	+CPBP: 15, ”+331290101”, 145, ”8045682344FFFF” OK	Display the entry corresponding to the specified phone number (UCS2 format)
AT+CPBP=”0129”	+CME ERROR: 22	Entry not found
AT+CPBS=”SM”	OK	Select ADN phonebook
AT+WCOS=0	OK	Phonebook not extended
AT+CPBP=“0123456789”	+CPBF: 1,”0123456789”,129, ”Test ADN”,0	Display locations with text field starting with “Test”, extended entry
AT+WCOS=1	OK	
AT+CPBP=“0123456789”	+CPBF: 1,”0123456789”,129, ”Test ADN”,0	Display locations with text field starting with “Test”, extended entry
AT+CPBS=”ME”	OK	Select ADN phonebook
AT+WCOS=0	OK	Phonebook not extended
AT+CPBP=“0123456789”	+CPBF: 1,”0123456789”,129, ”Test ME”	Display locations with text field starting with “Test”
AT+WCOS=1	OK	Phonebook extended
AT+CPBP=“0123456789”	+CPBF: 1,”0123456789”,129, ”Test ME”,”9876543210”, 129,””,,””,,””,,” e_mail@somewhere.com”, ”postal address”,0	Display locations with text field starting with “Test”, extended entry

+CPBN – Move action in phonebook

Description:

This specific command performs a forward or backward move in the phonebook (in alphabetical order). It is not allowed for the "EN" phonebook which does not contain alphanumeric fields.

Syntax:

AT+CPBN=<mode>

Response syntax:

The entry is stored in the ADN phonebook and AT+WCOS=0

+CPBN: <loc>,<num>,<type>,<name>

The entry is stored in the ADN phonebook and AT+WCOS=1

+CPBN: <loc>,<num>,<type>,<name>,<Phb_group>

The entry is stored in the ME phonebook and AT+WCOS=0

+CPBN: <loc>,<num>,<type>,<name>

The entry is stored in the ME phonebook and AT+WCOS=1

+CPBN: <loc>,<num>,<type>,<name>,<Contact>,<Phb_group>

Parameters:

<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

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

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

Command example	Possible responses	Note
AT+CPBF=”Er”	+CPBF: 15,”+331290101”,145, ”Eric” OK	Find ”Er” in phonebook
AT+CPBN=2	+CPBN: 5,”+33147658987”,145, ”Frank” OK	Read the next location
AT+CPBF=”Er”	+CPBF: 15,”+331290101”,145, ”Eric” OK	Display the location
AT+CPBN=4	+CPBN: 15,”+331290101”,145, ”Eric” OK	Get the last location read
AT+CPBW=,”0146290800”, 129,”WM”	OK	Write an item at the first location available
AT+CPBN=4	+CPBN: 15,”+331290101”,145, ”Eric” OK	Display the last location read
AT+CPBN=5	+CPBN: 38,”0146290800,129, ”WM” OK	Display the last item written with its location
AT+CPBN=4	+CPBN: 38,”0146290800,129, ”WM” OK	Now the last item read is the last written item too
AT+CPBF=”800041FFFF”	+CPBF: 15,”+3312345”,145, ”8000414339FFFF” OK	Find”800041” in phonebook
AT+CPBN=4	+CPBN: 15,”+3312345”,145, ”8000414339FFFF” OK	Display the last location read

NOTE:

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

+CNUM – Subscriber number

Description:

This command returns the subscriber MSISDN(s).

If the subscriber has several MSISDNs for various services, each MSISDN is returned in a separate line.

Syntax:

AT+CNUM

Response syntax:

+CNUM: <alpha1>, <number1>, <type1>

+CNUM: <alpha2>, <number2>, <type2> ⁞⁞.

Parameters:

<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

Command example	Possible responses	Note
AT+CNUM	+CNUM: ”Phone”, “0612345678”,129 +CNUM: ”Fax”, “0687654321”,129 +CNUM: “80001002FFFF”, “+0183773”, 145 (UCS2 format) OK	Get MSISDN(s
AT+CNUM=?	OK	

+WAIP – Avoid phonebook init

Description:

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

Syntax:

AT+WAIP=<mode>

Parameters:

<mode>

0: Normal initialization (with phonebooks)

1: No phonebook initialization

Command example	Possible responses	Note
AT+WAIP?	+WAIP:0 OK	Current values ? Default value (init phonebooks)
AT+WAIP=?	+WAIP: (0,1) OK	Possible values ?
AT+WAIP =1	OK	Inhibit initialization of phonebooks (next boot
AT&W		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.

+WDCP – Delete Calls Phonebook

Description:

This specific command allows to delete the calls listed in some phonebooks.

Syntax:

AT+WDCP=<calls phonebook>

Parameters:

<calls phonebook>

“LD” SIM (ME extended) Last dialing phonebook

“MC” ME missed calls list phonebook

“RC” ME received calls list phonebook

Command example	Possible responses	Note
AT+WDCP?	OK	Test command
AT+WDCP=?	+WDCP: ("LD","MC","RC") OK	Identifiers of the phonebooks supporting a list of calls
AT+WDCP=”LD”	OK	Delete all the content of Last Dialing phonebook

+WCOS – Contact Selector

Description:

This command allows to enable/disable the displaying the extended contact.

Syntax:

AT+WCOS=<mode>

Parameters:

<mode>

0: Select the SIM contacts

1: Select the extended contacts for phonebook entries

2: Internal use only. Customer application should not use this value.

Command example	Possible responses	Note
AT+WCOS?	+WCOS: 1 OK	Test command
AT+WCOS=?	+WCOS: (0-2) OK	Possible responses
AT+WCOS=0	OK	Contact not selected
AT+WCOS=3	+CME ERROR: 3	Mode not allowed

+WPGW – Create and delete a phonebook group

Description:

This command creates or deletes a phonebook group.

Syntax :

AT+WPGW=<index>[,<name>]

Parameters:

<index>

Index of the new group

<name>

Name of the group. It can be up to 30 ASCII characters or 13 UCS2 characters long.

Command example	Possible responses	Note
AT+WPGW=?	+WPGW: (1-10),30 OK	Test command 10 possible groups, group name can be 30 characters max
AT+WPGW=1,"group 1"	OK	Create group #1
AT+WPGW=1,"phb group1"	OK	Rename group #1
AT+WPGW=1	OK	Erase group #1

+WPGR – Read a phonebook group

Description:

This command reads the phonebook group entries, the phonebook group name or the number of used records in a group.

Syntax:

AT+WPGR=<mode>,<index>

Parameters:

<mode>

1: read the name of one phonebook group

2: read the name 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 mode = 3 or mode = 4)

Command example	Possible responses	Note
AT+WPGR=?	+ WPGR: (1-4),(1-10) OK	Test command 10 possible groups
AT+WPGR=1,1	+WPGR: 1,"group 1" OK	Read the name of phonebook group 1
AT+WPGR=2	+WPGR: 1,"group 1" +WPGR: 2,"group 2" OK	Read the name of all phonebook groups
AT+WCOS=0	OK	phonebook not extended
AT+WPGR=3,1	+WPGR: 1,"+33123456789", 145,"John" +WPGR: 2,"+33567891234", 145,"Elvis" +WPGR: 31,"+331290909", 145,"Fred" +WPGR: 32,"0123456789", 129,"Test" OK	Lists all entries of phonebook group 1 SIM entries: index 1 and 2; Flash entries: index 31 and 32 (The SIM supports 30 entries in this example)
AT+WCOS=1	OK	phonebook extended

Command example	Possible responses	Note
AT+WPGR=3,1	+WPGR: 1, "+33123456789", 145, "John", 1 +WPGR: 2,"+33567891234", 145,"Elvis",1 +WPGR: 31,"+331290909", 145,"Fred", "0141284549",	Lists all entries of phonebook group 1 SIM entries: index 1 and 2; Flash entries: index 31 and 32 (The SIM supports 30 entries in this example)

	129,"0600003210", 129,"0141280000", 129, "019876543210", 129, "fred@mail_address.com", "Becker Street London", 1 +WPGR: 32,"0123456789", 129,"Test", "0141284549", 129, "0600003210", 129, "0141280000", 129, "6549873210", 129", "test@mail_address.com","",1 OK	
AT+WPGR=4,1	+WPGR: 4/100 OK	Read the number of used records in the phonebook group 1

NOTE:

The entries list displayed with AT+WPGR=3,1 contains records from both ME and SIM phonebook (MT phonebook).

+WPGS – Settings of a group

Description:

This command sets parameters of a group.

Syntax:

AT+WPGS=<mode>,<index>[,<restrict call>]

Parameters:

<mode>

0: Read group settings

1: Write group settings

<index>

Index of a 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)

Command example	Possible responses	Note
AT+WPGS=1,1,1	OK	set restrict call to "All Accepted"
AT+WPGS=0,1	+WPGS:1 OK	Command reads group 1 settings
AT+WPGS=?	+WPGS: (0-1),(1-10),(0-1) OK	Test command

Short Messages commands

Parameters definition

<da>	Destination Address, coded like GSM 03.40 TP-DA
<dcs>	Data Coding Scheme, coded like in document [5].
<dt>	Discharge Time in string format: "yy/MM/dd,hh:mm:ssÍzz"(Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour]). Years range is [2000-2099]
<fo>	First Byte, coded like SMS-SUBMIT first byte in document [4], default value is 17 for SMS-SUBMIT
<index>	Place of storage in memory.
<length>	Text mode (+CMGF=1): number of characters PDU mode (+CMGF=0): length of the TP data unit in bytes
<mem1>	Memory used to list, read and delete messages (+CMGL, +CMGR and +CMGD).
<mem2>	Memory used to write and send messages (+CMGW, +CMSS).
<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 03.40 TPDU in hexadecimal format, coded as specified in doc [4] For CBS: GSM 03.41 TPDU in hexadecimal format
<ra>	Recipient Address.
<sca>	Service Center Address
<scts>	Service Center Time Stamp in string format: "yy/MM/dd,hh:mm:ssÍzz" (Year/Month/Day,Hour:Min:SecondsÍTimeZone)
<sn>	CBM Serial Number
<st>	Status of a SMS-STATUS-REPORT
<stat>	Status of message in memory.
<tooa>	Type-of-Address of <oa>.
<tora>	Type-of-Address of <ra>.
<tosca>	Type-of-Address of <sca>.
<total1>	Number of message locations in <mem1>.
<total2>	Number of messages locations in <mem2.
<total3>	Number of messages locations in <mem3>.
<used1>	Total number of messages locations in <mem1>.
<used2>	Total number of messages locations in <mem2.
<used3>	Total number of messages locations in <mem3>.
<vp>	Validity Period of the short message, default value is 167

+CSMS – Select message service

Description:

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

Syntax:

AT+CSMS=<service>

Parameters:

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.

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

+CNMA – New Message Acknowledgement

Description:

This command allows reception of a new message routed directly to the TE to be acknowledged.

In TEXT mode, only positive acknowledgement to the network (RP-ACK) is possible.

In PDU mode, either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network is possible.

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

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

Syntax:

In text mode: AT+CNMA

In PDU mode: AT+CNMA [= <n> [, <length> [<CR>

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

NOTE:

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

Parameters:

<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

NOTE:

Please refer to GSM 03.40 Recommendation for other PDU negative acknowledgement codes.

Text mode

Command example	Possible responses	Note
AT+CMGF=1	OK	Set TEXT mode
AT+CNMI=2,2,0,0,0	OK	<mt>=2
	+CMT: “123456”,”98/10/01, 12:30 00+00”, 129, 4, 32, 240, “15379”, 129, 5<CR><LF>	Message received
AT+CNMA	OK	Send positive acknowledgement to the network
AT+CNMA	+CMS ERROR: 340	Try to acknowledge again No +CNMA acknowledgment expected

PDU mode

Command example	Possible responses	Note
AT+CMGF=0	OK	Set PDU mode
AT+CNMI=2,2,0,0,0	OK	<mt>=2
	+CMT: ,29 07913366003000F1240B913366920547F300000030034194 04800B506215D42ECFE7E17 319	Message received
AT+CNMA=2,2<CR> <00D3><Ctrl-Z>	OK	Negative ACK to the SMS. Memory capacity exceeded
AT+CNMA=2,2<CR> <00D0><Ctrl-Z>	OK	Negative ACK to the SMS. SIM memory storage is full
AT+CNMA=2,2<CR> <00D2><Ctrl-Z>	OK	Negative ACK to the SMS. Error in MS
AT+CNMA=2,2<CR> <00FF><Ctrl-Z>	OK	Negative ACK to the SMS. Unspecified error

+CPMS – Preferred Message Storage

Description:

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

Syntax:

AT+CPMS=<mem1>[,<mem2>[,<mem3>]]

Parameters:

<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.

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

BM: CBM message storage (in 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.

NOTE:

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 in flash is 99.

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

Command example	Possible responses	Note
AT+CPMS=?	+CPMS: ((“SM”,”ME”,”BM”,”SR”), (“SM”,”ME”), (“SM”,”ME”)) OK	Possible message storages, Read, list, delete: SMS or SMS Status Report Write, send: SMS
AT+CPMS?	+CPMS: “SM”,3,10,”SM”,3,10, ”SM”,3,10 OK	Read Read, write SMS from/to SIM. 3 SMS are stored in SIM. 10 is the total memory available in SIM
AT+CPMS=”SM”,”ME”,”SM”	+CPMS: 3,10,3,99,3,10 OK	Select SM for reading, ME for writing and SM for storing
AT+CPMS?	+CPMS: “SM”,3,10,”ME”, 3,99,”SM”,3,10 OK	Read, store...SMS from/to flash, write SMS to flash. 3 SMS are stored in flash. 99 is the total memory available in flash
	+CMTI: “SM”,4	Receive a SMS stored in SIM at location 4
AT+CPMS=”ME”,”ME”,”ME”	+CPMS: 3,99,3,99,3,99 OK	Select ME for reading, ME for writing and ME for storing
AT+CPMS?	+CPMS: “ME”,3,99,”ME”, 3,99,”ME”,3,99 OK	Read, write, store SMS from/to flash. 3 SMS are stored in flash. 99 is the total memory available in flash
	+CMTI: “ME”,4	Receive a SMS stored in flash at location 4
AT+CPMS=”AM”	+CMS ERROR: 302	Select wrong message storage
AT+CPMS=”SM”	+CPMS: 4,10,4,99,4,99 OK	Select SM for reading, writing and storing memory are not changed
AT+CPMS?	+CPMS: “SM”,4,10,”ME”, 4,99,”ME”,4,99 OK	Read SMS from SIM; write, store SMS from/to flash

+CMGF – Preferred Message Format

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 or character is converted to a byte (e.g.: '41' is converted to the ASCII character 'A', whose ASCII code is 0x41 or 65).

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

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

Syntax:

AT+CMGF=<mode>

Command example	Possible responses	Note
AT+CMGF?	+CMGF:1 OK	Current message format Text mode
AT+CMGF=?	+CMGF: (0,1) OK	Text or PDU modes are availabe

Sending an SMS Message in PDU mode

Command example	Possible responses	Note
AT+CMGF=0	OK	Set PDU mode
AT+CMGS=14<CR> 0001030691214365000 004C9E9340B	+CMGS: 4 OK	Send complete MSG in PDU mode, no SC address MSG correctly sent, <mr> is returned

+CSAS – Save Settings

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.

Syntax:

AT+CSAS

Parameters:

<mode> PDU or text mode

0: PDU mode

1: Text mode

NOTE:

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

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

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

<fo>

0x01 (SMS-SUBMIT, no validity period)

<mr>

(TP-MR) 0x03 (Message Reference)

<da>

(TP-DA) 0x06 0x91 0x21 0x43 0x65 (destination address +123456)

<pid>

(TP-PID) 0x00 (Protocol Identifier)

<dcs>

(TP-DCS) 0x00 (Data Coding Scheme: 7 bits alphabet)

<length>

(TP-UDL) 0x04 (User Data Length, 4 characters of text)

TP-UD

0xC9 0xE9 0x34 0x0B (User Data: ISSY)

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

Command example	Possible responses	Note
AT+CSAS	OK	Store +CSCA and +CSMP parameters

+CRES – Restore settings

Description:

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

Syntax:

AT+CRES

Command example	Possible responses	Note
AT+CRES	OK	Restore +CSCA and +CSMP parameters

+CSDH – Show text mode parameters

Description:

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

Syntax:

AT+CSDH=<n>

Parameters:

<n>

Show indicator

0: do not show header values

1: show the values in result codes

Command example	Possible responses	Note
AT+CSDH=0	OK	Set value to "do not show"
AT+CSDH?	+CSDH: 0 OK	Current value Do not show header values

+CNMI – New message indication

Description:

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

Syntax:

AT+CNMI=<mode>,<mt>,<bm>,<ds>,<bfr>

Parameters:

<**mode**> controls the processing of unsolicited result codes

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

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

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

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

NOTE:

Only <mode>=2 is supported.

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

<mt>

sets the result code indication routing for SMS-DELIVER indications. Default is 1.

0: No SMS-DELIVER indications are routed.

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

2: SMS-DELIVERs (except class 2 messages) are routed using unsolicited code:
If PDU mode: +CMT: [<alpha>], <length> <CR> <LF> <pdu>
If text mode: +CMT: <oa>,[<alpha>], <scts> [,<tooa>, <fo>, <pid>, <dcs>, <sca>, <tosca>, <length>] <CR><LF><data>

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

<bm>

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

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

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

2: New CBMs are routed directly to the TE using unsolicited result code.
If PDU mode: +CBM: <length><CR><LF><pdu> or
If text mode: +CBM:<sn>,<mid>,<dcs>,<page>,<pages> <CR><LF> <data>

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

Other classes CBMs: as <bm>=1.

<ds>

For SMS-STATUS-REPORTs. Default is 0.

0: No SMS-STATUS-REPORTs are routed.

1: SMS-STATUS-REPORTs are routed using unsolicited code:
If PDU mode: +CDS: <length> <CR> <LF> <pdu> (PDU mode) or
If text mode: +CDS: <fo>,<mr>, [<ra>] , [<tora>], <scts>,<dt>,<st> (Text mode)

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

<bfr>

Default is 0.

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

1: TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1. . .3 is entered.

Command example	Possible responses	Note
AT+CNMI=2,1,0,0,0	OK	<mt>=1
	+CMTI: "SM",1	Message received
AT+CNMI=2,2,0,0,0	OK	<mt>=2
	+CMT: "123456","98/10/01, 12:30 00+00",129,4,32,240, "15379",129,5	Message received
AT+CNMI=2,0,0,1,0	OK	<ds>=1
AT+CMGS="+33146290 800"<CR> Happy Birthday! <ctrl-Z>	+CMGS: 7 OK	Send a message in text mode, Successful transmission
	+CDS: 2, 116, "+33146290800", 145, "98/10/01,12:30:07+04", "98/10/01 12:30:08+04", 0	Message was correctly delivered

+CMGR – Read message

Description:

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

Parameters:

See table in beginning of section "short messages commands"

NOTE:

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

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

Command example	Possible responses	Note
	+CMTI: “SM”,1	New message received
AT+CMGR=1	+CMGR: “REC UNREAD”, ”0146290800”, ”98/10/01, 18:22:11+00”, <CR><LF> ABCdefGHI OK	Read the message
AT+CMGR=1	+CMGR: “REC READ”,”0146290800”, ”98/10/01, 18:22:11+00”, <CR><LF> ABCdefGHI OK	Read the message again
AT+CMGR=2	+CMS ERROR: 321	Error: invalid index
AT+CMGF=0 ;+CMGR=1	+CMGR: 2,,<length> <CR><LF><pdu> OK	In PDU mode Message is stored but unsent, no <alpha>field
AT+CMGF=1;+CPMS= ”SR”;+CNMI=,,,2	OK	Reset to text mode, set read memory to “SR”, and allow storage of further SMS Status Report into “SR” memory
AT+CMSS=3	+CMSS: 160 OK	Send an SMS previously stored
	+CDSI: “SR”,1	New SMS Status Report stored in “SR” memory at index 1
AT+CMGR=1	+CMGR: “REC UNREAD”, 6,160, “+33612345678”, 129, “01/05/31,15:15:09+00”, “01/05/31,15:15:09+00”, 0 OK	Read the SMS Status Report

+CMGL – List message

Description:

This command allows the application to read stored messages, by indicating the type of the message to read.

The messages are read from the memory selected by the +CPMS command.

Syntax:

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> . . .)

Parameters:

<stat>

Text mode	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.

Command example	Possible responses	Note
AT+CMGL="REC UNREAD"	+CMGL: 1,"REC UNREAD", "0146290800",,<CR><LF> I will be late +CMGL: 3,"REC UNREAD", "46290800",, <CR><LF> See you tonight ! OK	List unread messages in text mode 2 messages are unread, these messages will then have their status changed to "REC READ"
AT+CMGL="REC READ"	+CMGL: 2,"REC READ", "0146290800",,<CR><LF> Keep cool OK	List read messages in text mode
AT+CMGL="STO SENT"	OK	List stored and sent messages in text mode No message found
AT+CMGL=1	+CMGL: 1,1,,26<CR><LF> 07913366003000F3040B9133 66920547F400130011904125 30400741AA8E5A9C5201 OK	List read messages in PDU mode

+CMGS – Send message

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').

Syntax in text mode:

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

Syntax in PDU mode:

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

Parameters:

See table in beginning of section "short messages commands"

NOTE:

The message reference <mr> that is returned to the application is allocated by the product. This number begins with 0 and is incremented by one for each outgoing message (successful and failure cases); it is cyclic on one byte (0 follows 255).
This number is not a storage number – outgoing messages are not stored.

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

+CMGW – Write Message to Memory

Description:

This command stores a message in memory (either SMS-SUBMIT or SMS-DELIVERS). The memory location <index> is returned (no choice possible as with phonebooks +CPBW).

Text or PDU is entered as described for the Send Message +CMGS command.

Syntax text mode:

(<index> is returned in both cases)

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

enter text <ctrl-Z / ESC>

Syntax in PDU mode:

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

give PDU <ctrl-Z / ESC>

Parameters:

<oa/da>

Originating or Destination Address Value in string format.

<tooa/toda>

Type of Originating / Destination Address

<stat>

Text mode	**PDU mode**
"REC UNREAD"	0
"REC READ"	1
"STO UNSENT"	2
"STO SENT"	3

NOTE:

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.

<length>

Length of the actual data unit in bytes

Command example	Possible responses	Note
AT+CMGW=" +33146290800"<CR> Hello how are you ?<ctrl-Z>	>	Write a message in text mode
	+CMGW: 4 OK	Message stored in index 4
AT+CMGW =<length><CR> <pdu><ctrl-Z>	>	Write a message in PDU mode
	+CMGW: <index> OK	Message stored in <index>

+CMSS – Send Message From Storage

Description:

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

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

Parameters:

See table in beginning of section "short messages commands"

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

+CSMP – Set Text Mode Parameters

Description:

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

Syntax:

AT+CSMP=<fo>, <vp>, <pid>,<dcs>

Parameters:

<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 result

RP: Reply Path, not used in text mode.

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

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

VPF: Validity Period Format

b4=0 & b3=0 <vp> field is not present

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

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

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

<vp>

Only coded in "relative" format. The default value is 167 (24 hours). This means that one byte can describe different values:

0 to 143 (VP + 1) x 5 minutes (up to 12 hours)

144 to 167 12 hours + ((VP – 143) x 30 minutes)

168 to 196 (VP – 166) x 1 day

197 to 255 (VP – 192) x 1 week

<pid>

Is used to indicate the higher layer protocol being used or indicates inter-working with a certain type of telematic device. For example, 0x22 is for group 3 fax, 0x24 is for voice telephone, 0x25 is for ERMES (European Radio Messaging System).

<dcs>

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

Command example	Possible responses	Note
AT+CSMP?	+CSMP: 0,0,0,0 OK	No validity period <dcs>= PCCP437 alphabet (8 bits → 7 bits)
AT+CSMP=17,23,64,244	OK	:<vp> = 23 (2 hours, relative format) <dcs> = GSM 8 bits alphabet

+CMGD – Delete message

Description:

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

Refer also to +CPMS – Preferred Message Storage command.

Syntax:

AT+CMGD=<Index> [,<DelFlag>]

Parameters:

<index>

If <DelFlag> = 0

(1-20) If the preferred message storage is "BM"
SIM dependant 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> (default value).

1: Delete All READ messages

2: Delete All READ and SENT messages

3: Delete All READ, SENT and UNSENT messages

4: Delete All messag

NOTE:

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.

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

+CSCA – Service center address

Description:

This command is used to indicate to which service center the message must be sent.

The product has no default value for this address. If the application tries to send a message without having indicated the service center address, an error will be generated.

Therefore, the application must indicate the SC address when initializing the SMS. This address is then permanently valid. The application may change it if necessary.

Syntax:

AT+CSCA=<sca>

Parameters:

See table in beginning of section "short messages commands"

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

+CSCB – Select Cell Broadcast Message Types

Description:

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

Syntax:

AT+CSCB= <mode>, [<mids>, [<dcss>]]

Parameters:

<mode>

0: Message types specified in <mids> and <dcss> are accepted

1: Message types specified in <mids> and <dcss> are not accepted

<mids>

Indicates to which type of message identifiers the ME should listen.

<dcss>

Supported languages

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.

NOTE:

The <bm> parameter of +CNMI command controls the message indication.
Test read command (AT+CSCB ?) is not supported.

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

+WCBM – Cell Broadcast Message Identifiers

Description:

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

NOTE:

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

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

Syntax:

AT+WCBM= <mids>

Parameters:

See table in beginning of section "short messages commands"

Command example	Possible responses	Note
AT+WCBM= "10,100,1000,10000"	OK	Write 4 messages identifiers in EF-CBMI
AT+WCBM?	+WCBM="10,100,1000,100000" OK	4 CBMIs are stored in EF-CBMI

+WMSC – Message status modification

Description:

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

Syntax:

AT+WMSC= <loc>, <status>

Parameters:

<loc>

Location number of the stored message (integer)

<status>

New status to be stored, as for +CMGL command:

Text mode	PDU mode
"REC UNREAD"	0
"REC READ"	1
"STO UNSENT"	2
"STO SENT"	3

Possible responses:

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

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

+WMGO – Message overwriting

Description:

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

NOTE:

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.

If the storage area is changed with the AT+CPMS command, the value of WMGO will be reset to 0.

Syntax:

AT+WMGO= <loc>

Parameters:

<loc>

The location number of the SMS to write or overwrite. Number depends of the SIM or Flash memory capacity.

Command example	Possible responses	Note
AT+CPMS?	+CPMS: “SM”,3,10,”SM”,3,10,”SM”,3,10 OK	Check the storage area
AT+CMGW= ”+33146290800”<CR> Hello how are you ?<ctrl-Z>	+CMGW: 4 OK	Message stored in index 4 in the SIM
AT+WMGO=?	+WMGO: (1-10) OK	Possible values for the SIM
AT+WMGO=4	OK	
AT+CMGW= ”+33146290000”<CR> You are overwritten<ctrl-Z>	+CMGW: 4 OK	New Message stored in index 4
AT+WMGO?	+WMGO: 4 OK	The value was used, so re-initialization
AT+WMGO=4	OK	
AT+CPMS=”SM”,”ME”,”SM”	+CPMS: 3,10,0,99,3,10 OK	Change the storage area from SIM to Flash
AT+WMGO=?	+WMGO: (1-99) OK	Possible values for the Flash
AT+WMGO?	+WMGO: 0 OK	We changed the storage area, so the value was reinitialized
AT+WMGO=999	+CMS ERROR: 321	

+WUSS – Un-change SMS Status

Description:

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

Syntax:

AT+WUSS = <mode>

Parameters:

<mode>

1: The SMS Status will not change.
0: The SMS Status will change.

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

Command example	Possible responses	Note
AT+CMGR=10	+CMGR: "REC READ", "+33660669023",, "03/02/13,18:56:55+00" <CR><LF> It is me again. OK	The state has been updated
AT+WUSS?	+WUSS: 0 OK	

+WMCP – Copy Messages

Description:

This command copy the SMS from the SIM to the Flash or from the Flash to the SIM.

Syntax:

AT+WMCP=<mode>[,<loc>]

Parameters:

<mode>

0: From the 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 have the first free locat

The location of the SMS which can be copied from the SIM to the flash is 1 to 12 (maximum available in the SIM). The location of the SMS which can be copied from the flash to the SIM is 1 to 99 (the maximum available in the flash).

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

Command example	Possible responses	Note
AT+CMGR=4	+CMGR: "REC UNREAD","+33146290800", "98/10/01,18:22:11+00", <CR><LF> Other test message: SMS in the Flash at location 2 OK	Read the first SMS from the SIM
AT+CPMS="ME"	+CPMS: 2,99,2,99,4,10 OK	Select ME for reading
AT+CMGD=0,4	OK	Erase all the SMS stored in the Flash
AT+CPMS?	+CPMS: "ME",0,99,"ME", 0,99,"SM",4,10 OK	No SMS is stored in the flash.
AT+WMCP=0	OK	Copy all the SMS from the SIM to the Flash
AT+CPMS?	+CPMS: "ME",4,99,"ME", 4,99,"SM",4,10 OK	4 SMS are stored in the flash.

+CMMS – More Messages to Send

Description:

This short message service-oriented AT command allows to keep the link opened while sending several short messages within a short delay.

Syntax:

AT+CMMS = <mode>

Parameters:

<mode>

0: Disable feature

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

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

NOTE:

The delay of 5 seconds complies with Rec 3GPP 27.005 §3.5.6.

Before sending the last SMS in the link, you must use AT+CMMS=0 command. This command will indicate that the NEXT SMS will be the last one.

Command example	Possible responses	Note
AT+ CMMS=0	OK	Feature is disabled
AT+ CMMS=1	OK	Feature is enabled, link is open
AT+ CMMS=2	OK	Feature is enabled, link is open
AT+ CMMS?	+CMMS: 2 OK	
AT+ CMMS=?	+CMMS: (0-2) OK	

Supplementary Services commands

+CCFC – Call forwarding

Description:

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

Syntax:

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

Response syntax:

+CCFC: <status>, <class1> [, <number>, <type> [,<subaddr>, <satype>[,<time>]]]

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

Parameters:

<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: Fax

8: Short Messages

7: All classes

NOTE:

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

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

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

<subaddr>

not managed

<satype>

not managed

<time>

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

<status>

0: not active

1: active

Command example	Possible responses	Note
AT+CCFC=0,3,"01462 90800"	OK	Register to an unconditional call forwarding
AT+CCFC=0,2	+CCFC:1,1,"0146290800",129 +CCFC:1,2,"0146290802",129 +CCFC:1,4,"0146290804",129 OK	Interrogate unconditional call forwarding Call forwarding active for voice Call forwarding active for data Call forwarding active for fax
AT+CCFC=0,4	OK	Erase unconditional call forwarding

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

+CLCK – Call barring

Description:

This command allows control of the call barring supplementary service.

Locking, unlocking or querying the status of call barring is possible for all classes or for a specific class, but not a combination of some.

Syntax:

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

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

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

Parameters:

<fac>

"AO", "OI", "OX" barring for outgoing calls

"AI", "IR" barring for incoming calls

"AG", "AC","AB" for all calls barring (<mode>=0 only)

<mode>

0: Unlocks the facility

1: Locks the facility

2: Query status

<class>

see description for +CLCK command (Facility lock) or +CCFC (Call forwarding).

NOTE:

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

The password code is over 4 digits maximum.

<status>

0: not active

1: active

Command example	Possible responses	Note
AT+CLCK="AO",1,1234	OK	Lock the AO facility
AT+CLCK="AO",0,5555	+CME ERROR: 16	Wrong password
AT+CLCK="AO",0,1234	OK	Unlock the AO facility

+CPWD – Modify SS password

Description:

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

Syntax:

AT+CPWD=<fac>,<OldPassword>, <NewPassword>

Parameters:

<fac>

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

NOTE:

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

<OldPassword>, <NewPassword>

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

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

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

+CCWA – Call waiting

Description:

This command allows control of the call waiting supplementary service.

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

Syntax:

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

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

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

Unsolicited result: (when waiting service is enabled)

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

Parameters:

<n>

result code presentation status in the TA

0: Disable

1: Enable

<mode>

0: Disable

1: Enable

2: Query status

<type>

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

<class>

1: Voice

2: Data

4: Fax

8: Short Messages

7: All classes (voice, data and fax)

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

<status>

0: not active

1: active

<alpha>

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

Command example	Possible responses	Note
AT+CCWA=1,1,1	OK	Enable call waiting for voice calls
AT+CCWA=1,2	+CCWA:1,1 OK	Interrogate call waiting Call waiting active for voice calls
	+CCWA:"0146290800",145,1,"FREDDY" +CCWA:"0146290800",145,1,"8023459678FFFF"	Number and name of the waiting voice call Number and name of the waiting voice call (UCS2 format)
AT+CCWA=1,0,7	OK	Erase call waiting
	+CCWA:,,1	voice call waiting (no number)

+CLIR – Calling line identification restriction

Description:

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

Syntax:

AT+CLIR=<n>

Response syntax: (for AT+CLIR?)

+CLIR:<n>,<m>

Parameters:

<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

Command example	Possible responses	Note
AT+CLIR=2	OK	Set command

+CLIP – Calling line identification presentation

Description:

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

Syntax:

AT+CLIP=<n>

Response syntax: (for an incoming call, after each RING or +CRING indication)

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

Parameters:

<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)

Command example	Possible responses	Note
AT+CLIP=1	OK	Enable CLIP
	RING +CLIP: "0146290800", 129,1,,"FRED"	Incoming call Incoming call with number and name presentation
	RING +CLIP: "0146290800", 129,1,,"8000204212FFFF"	Incoming call Incoming call with number and name presentation (UCS2 format)
AT+CLIP=0	OK	Disable CLIP presentation

+COLP – Connected line identification presentation

Description:

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

Syntax:

AT+COLP=<n>

Response syntax: (after ATD command, before OK or CONNECT <speed>)

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

Parameters:

<n>

Parameter sets/shows the result code presentation status in the TA

0: Disable

1: Enable

<m>

Parameter shows the subscriber COLP service status in the network

0: COLP not provisioned

1: COLP provisioned

2: Unknown (no network)

Command example	Possible responses	Note
AT+COLP=1	OK	Activate COLP
AT+COLP?	+COLP:1,1 OK	Ask for current functionality COLP is enabled and provisioned
ATD146290928;	+COLP:"0146290928", 129,,"JOE"	Outgoing call (text format)
ATD146290928;	+COLP:"0146290800", 129,1,,"8000204212FFFF" OK	Outgoing call (UCS2 format)
AT+COLP=0	OK	Deactivate COLP

+CAOC – Advice of charge

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 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.

Syntax:

AT+CAOC= <mode>

Parameters:

<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.

Command example	Possible responses	Note
AT+CAOC=0	+CAOC: "000A08" OK	Query CCM value Display Current Call Meter value (CCM=2568)
AT+CAOC=1	OK	Deactivate unsolicited report of CCM value
AT+CAOC=2	OK	Activate unsolicited report of CCM value

+CACM – Accumulated call meter

Description:

This command resets the Advice of Charge for accumulated call meter value in SIM file EFACM. 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.

Syntax:

AT+CACM:<pin2 passwd>

Possible response:

+CACM: <acm value>

Parameters::

<pin2 passwd>

String type

<acm value>

String type coded as <ccm> under +CAOC.

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

+CAMM – Accumulated call meter maximum

Description:

The set command sets the Advice of Charge related to accumulated call meter maximum value in SIM file EFACMmax. ACMmax contains the maximum number of home units the subscriber is allowed to spend. 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.

Syntax:

AT+CAMM:<ACMmax>,<pin2 passwd>

Parameters:

<ACMmax>

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

<pin2 passwd>

String type

Command example	Possible responses	Note
AT+CAMM="000400",1234	OK	Request ACMmax update, PIN2 is "1234"
AT+CAMM="000400",0000	+CME ERROR: 16	Request ACMmax update, wrong PIN2"
AT+CAMM ?	+CAMM: "000400" OK	Request ACMmax value ACMmax = 1024

+CPUC – Price per unit and currency table

Description:

The set command sets the parameters for Advice of Charge related to price per unit and the currency table in SIM file EFPUCT. 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.

Syntax:

AT+CPUC:<currency>,<ppu>,<pin2 passwd>

Parameters:

<currency>

String type

<ppu>

String type

<pin2 passwd>

String type

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

+CHLD – Call related supplementary services

Description:

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

Syntax:

AT+CHLD=<n>

Parameters:

<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).

Command example	Possible responses	Note
AT+CHLD=1	OK	Release all held calls
AT+CHLD=?	+CHLD: (0-4, 11-17, 21-27) OK	Possible values

+CLCC – List current calls

Description:

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

Syntax:

AT+CLCC

Response syntax: (OK if no calls are available)

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

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

Parameters:

<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

2: fax

9: unknown

<mpty>

Multiparty

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

1: all 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)

Command example	Possible responses	Note
	RING	Incoming call
AT+CLCC	+CLCC: 1,1,4,0,0,"014629 4079",129 OK	
ATA	OK	Answering the call
AT+CLCC	+CLCC: 1,1,1,0,0,"014629 4079",129 OK	
ATD0146299704;	OK	Outgoing call
AT+CLCC	+CLCC: 1,0,2,0,0,"014629 4079",129 OK	Before the phone called is ringing
AT+CLCC	+CLCC: 1,0,3,0,0,"014629 4079",129 OK	The phone called is ringing
AT+CLCC	+CLCC: 1,0,0,0,0,"014629 4079",129 OK	The call is being answered

+CSSN – Supplementary service notifications

Description:

This command refers to supplementary service related network initiated notifications.

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.

Parameters:

<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

+CUSD – Unstructured supplementary service data

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

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>]

Parameters:

<n>

0: Disable the result code presentation

1: Enable the result code presentation

2: Cancel session (not applicable to read command response)

<m>

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

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

2: USSD terminated by network

4: Operation not supported

<str>

Network string (name), converted in the selected character set

<dcs>

The data coding scheme received (GSM TS 03.38).

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!

Parameters to send and receive USSD:

<str>

Is the USSD string to be sent.

<dcs>

The default alphabet and the UCS2 alphabet are supported.

NOTE:

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

+CCUG – Closed user group

Description:

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

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

The +CCUG command is used to:

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

Syntax:

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

Parameters:

<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. In this case, index and info values will be used.

Data commands

Using AT Commands during a data connection

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

Switch from online to offline mode

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

NOTE:

The "+++" sequence will only work with the +ICF command using one of the following settings:

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

Switch from offline to online mode

See the ATO command description.

+CBST – Bearer type selection

Description:

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

NOTE:

1: For incoming calls, if <ce> is set to 'T' only and the network offers only 'NT' or vice versa, then the call is released.

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

Syntax:

AT+CBST= <speed>, <name>, <ce>

Parameters:

<speed>

0 (default): Autobauding (modem type: none)

1: 300 bit/s (modem type: V.21)

2: 1200 bit/s (modem type: V.22)

3: 1200/75 bit/s (modem type: V.23)

4: 2400 bit/s (modem type: V.22bis)

5: 2400 bit/s (modem type: V.26ter)

6: 4800 bit/s (modem type: V.32)

7: 9600 bit/s (modem type: V.32)

8: Reserved

12: 9600 bit/s (modem type: V.34)

14(*): 14400 bit/s (modem type: V.34)

65: 300 bit/s (modem type: V.110)

66: 1200 bit/s (modem type: V.110)

68: 2400 bit/s (modem type: V.110)

70: 4800 bit/s (modem type: V.110)

71: 9600 bit/s (modem type: V.110)

75(*): 14400 bit/s (modem type: V.110)

(*)This speed configures data and fax 14.4 kbit/s 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

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

+FCLASS – Select mode

Description:

This command sets the product into a particular operating mode (data or fax).

Syntax:

AT+FCLASS= <n>

Parameters:

<n>

0: Data

1: Fax class 1

2: Fax class 2

Command example	Possible responses	Note
AT+FCLASS=?	+FCLASS: (0,1) OK	Test command Fax class 2 not supported
AT+FCLASS=?	+FCLASS: (0,1,2) OK	Test command Fax class 2 supported
AT+FCLASS=0	OK	Data mode requested
AT+FCLASS=1	OK	Fax class 1 mode requested
AT+FCLASS?	+FCLASS: 1 OK	Current value

+CR – Service reporting control

Description:

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

These report types are:

+CR: ASYNC For asynchronous transparent

+CR: REL ASYNC For asynchronous non-transparent

Syntax:

AT+CR=<mode>

Parameters:

<mode>

0: disable extended reports

1: enable extended reports

Command example	Possible responses	Note
AT+CR=0	OK	Extended reports disabled
AT+CR=1	OK	Extended reports enabled
AT+CR?	+CR: 1 OK	Current value
AT+CR=?	+CR: (0,1) OK	Possible values

+CRC – Cellular result codes

Description:

This command allows more detailed ring information for an incoming call (voice or data). Instead of the string "RING", an extended string is used to indicate which type of call is ringing (e.g. +CRING:VOICE).

These extended indications are:

+CRING ASYNC for asynchronous transparent

+CRING: REL ASYNC for asynchronous non-transparent

+CRING:VOICE for normal speech.

+CRING: FAX for fax calls

Syntax

AT+CRC=<mode>

Parameters:

<mode>

0: disable extended reports

1: enable extended reports

Command example	Possible responses	Note
AT+CRC=0	OK	Extended reports disabled
AT+CRC=1	OK	Extended reports enabled
AT+CRC?	+CRC: 1 OK	Current value
AT+CRC=?	+CRC: (0,1) OK	Possible values

+ILRR – DTE-DCE local rate reporting

Description:

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

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

Syntax:

AT+ILRR = <value>

Parameters:

<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 (kbit/s).

Command example	Possible responses	Note
AT+ILRR=0	OK	Local port rate report disabled
AT+ILRR=1	OK	Local port rate report enabled
AT+ILRR?	+ILRR: 1 OK	Current value
AT+ILRR=?	+ILRR: (0,1) OK	Possible values

+CRLP – Radio link protocol parameters

Description:

This command modifies the radio link protocol parameters used for non transparent data transmission.

Syntax:

AT+CRLP= <iws>, <mws>, <T1>, <N2>, <ver>

Parameters:

<iws>

Down window size, (default is 61)

Range 0 to 61

<mws>

Up window size, (default is 61)

Range 0 to 61

<T1>

Acknowledgement timer in units of 10ms, (default is 48)

Range 40 to 255

<N2>

Retransmission attempts, (default is 6),

Range 1 to 255

<ver>

Version number.

0: V42bis is not supported.

1: V42bis is supported

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

+DOPT – Others radio link parameters

Description:

This specific command modifies some supplementary radio link protocol parameters.

Syntax:

AT+DOPT=<reset_allowed>,<dtx_allowed>

Parameters:

<reset_allowed>

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

1: Data communication is held, even in case of bad radio link (possible loss of data). Default value

<dtx_allowed>

0: Normal mode

1: Economic battery mode (not supported by all networks), default value

Command example	Possible responses	Note
AT+DOPT=1	OK	Set new parameters (2nd value is the default one)
AT+DOPT=?	(0,1),(0,1) OK	Test command DTX is supported
AT+DOPT=1,1	OK	Set new parameters
AT+DOPT?	1,1 OK	Current values

%C – Select data compression

Description:

This command enables or disables data compression negotiation if this feature is supported by the product.

Syntax:

AT%C<n>

Parameters:

<n>

0: no compression (default value)

2: V42bis compression if supported

Command example	Possible responses	Note
AT%C0	OK	Set no compression
AT%C2	OK	V42bis supported
AT%C?	2	
OK	Current value	

+DS – V42 bis data compression

Description:

This command enables or disables V.42bis data compression if this feature is supported by the product. Beware that the product only allows the MNP2 protocol.

Syntax:

AT+DS=<dir>,<neg>,<P1>,<P2>

Parameters:

< dir >

Specifies the desired direction(s) of operation of the data compression function; from the DTE point of view

0: Negotiated . . . no compression

1: Transmit only

2: Receive only

3: Both directions, accept any direction (default value)

< neg >

Specifies whether or not the DCE should continue to operate if the desired result is not obtained

0: Do not disconnect if V.42 bis is not negotiated by the remote DCE as specified in <dir> (default value)

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, (default is 2048)

Range 512 to 2048

<P2>

Specifies the maximum string length to be negotiated, (default is 20).

Range 6 to 250

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

+DR – V42 bis data compression report

Description:

This command determines whether or not the use of V42bis is allowed for an incoming or outgoing data call, if the 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, after the service report control +CR and before the +ILRR intermediate report.

Syntax:

AT+DR=<status>

Parameters:

<status>

State of the V42bis enabling

0: disabled (default value)

1: enabled

Command example	Possible responses	Note
AT+DR=?	+DR: (0.1) OK	
AT+DR=1	OK	Reporting enabled
AT+DR?	+DR: 1 OK	Current value

\N – Select data error correcting mode

Description:

This command controls the preferred error correcting mode for a data connection, if the feature is provided by the product. It can only be used for transparent data transmission.

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

Syntax:

AT\N<n>

Parameters:

<n>

0: Disables error correction mode (default value)

5: Selects MNP error correction mode

NOTE:

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

Command example	Possible responses	Note
AT\N0	OK	no error correction
AT\N?	0 OK	Current value
AT\N4	+CME ERROR: 3	Invalid paramter

Fax commands

The fax service provided by the product is class 1 compatible. However, only the core commands defined by ITU T.31 are supported. This means that commands such as AT+FAR, +FCC, etc. are not supported.

Autobauding must be enabled to set up the product for fax.

All commands described hereafter will return an ERROR response code if they are not issued during communication.

+FTM – Transmit speed

Description:

This command sets the fax transmit speed.

Syntax:

AT+FTM=<speed>

Parameters:

<speed>

24: 2400 bit/s (modem type V.27ter)
48: 4800 bit/s (modem type V.27ter)
72: 7200 bit/s (modem type V.29)
73: 7200 bit/s (long) (modem type V.17)
74: 7200-bit/s (short) (modem type V.17)
96: 9600 bit/s (modem type V.29)
97: 9600-bit/s (long) (modem type V.17)
98: 9600-bit/s (short) (modem type V.17)
121: 12000 bit/s (long) (modem type V.17)
122: 12000 bit/s (short) (modem type V.17)
145: 14400 bit/s (long) (modem type V.17)
146: 14400 bit/s (short) (modem type V.17)

Command example	Possible responses	Note
AT+FTM=?	(24,48,72,73,74,96,97,98, 121,122,145,146) OK	Test command Fax 14.4 kbit/s supported

+FRM – Receive speed

Description:

This command sets the fax receive speed.

Syntax:

AT+FRM=<speed>

Parameters:

The speed values are identical to those of the +FTM command (see 0).

Command example	Possible responses	Note
AT+FRM=?	(24,48,72,73,74,96,97,98, 121,122,145,146) OK	Test command Fax 14.4 kbit/s supported

+FTH – HDLC transmit speed

Description:

This command sets the fax transmit speed, using the HDLC protocol.

Syntax:

AT+FTH=<speed>

Parameters:

<speed>

3: V.21 channels 300 bit/s.

Command example	Possible responses	Note
AT+FTH=?	+FTH: (3)	
	OK	Test command

+FRH – HDLC receive speed

Description:

This command sets the fax receive speed, using the HDLC protocol.

Syntax:

AT+FRH=<speed>

Parameters:

<speed>

3:V.21 channels 300 bit/s.

Command example	Possible responses	Note
AT+FRH=?	+FTH: (3) OK	Test command

+FTS – Stop transmission and wait

Description:

This command stops transmission for the specified period.

Syntax:

AT+FTS=<n>

Parameters:

<n>

Silence period (unit is 10 ms).

Command example	Possible responses	Note
AT+FTS=?	(0-255) OK	Test command
AT+FTS=50	OK	Stops transmission and waits for 0.5s

+FRS – Receive silence

Description:

This command causes the modem to stop listening to the network and report back to the DTE after the specified period.

It is aborted if any character is received from the application.

Syntax:

AT+FRS=<n>

Parameters:

<n>

No-listening period (units is 10 ms).

Command example	Possible responses	Note
AT+FRS=?	(0-255) OK	Test command
AT+FRS=50	OK	Stops transmission and waits for 0.5s

Setting up the PC fax application:

The recommended fax application is Delrina WinFax v8.0.

It should be configured as follows (menu Setup/Fax Modem Setup):

- Port: any com
- Model: Generic Class 1 (hardware flow control). A generic class 1 with software flow control can also be selected.
- Init: default string is suitable for the product
- Reset: default string is suitable for the product
- Maximum Transmit Rate: 9600 baud (if higher, rate will be automatically cut back to 9600 baud).

Other settings are of no relevance for the GSM unit: they can be modified.

Fax class 2 commands

If the feature is supported, the commands +FDT, +FDR, +FET, +FPTS and +FK must be used during call only.

The other commands, +FBOR, +FBUF, +FCQ, +FCR, +FDCC, +FDIS, +FLID and +FPHCTO, cannot be used during call.

+FDT – Transmit Data

Description:

This command prefixes data transmission.

Syntax:

AT+FDT

Parameters:

No parameter

+FDR – Receive Data

Description:

This command initiates data reception.

Syntax:

AT+FDR

Parameters:

No parameter

+FET – Transmit page punctuation

Description:

This command punctuates page and document transmission after the +FDT command. It indicates that the current page is complete, and if there are additional pages to send.

Syntax:

AT+FET=<ppm>

The remote station should respond with +FPTS:<ppr>

Parameters:

<ppm>

0: Another page next, same document
1: Another document next
2: No more pages or documents
3: Another partial page next
4: Another page, procedure interrupt
5: Another document, procedure interrupt
6: All done, procedure interrupt

+FPTS – Page transfer status parameters

Description:

This command sets post page transfer response.

Syntax:

AT+FPTS=<ppr>

Parameters:

<ppr>

1: Page good
2: Page bad; retry requested
3: Page good; retrain requested
4: Page bad; interrupt requested
5: Page good; interrupt requested

+FK – Terminate Session

Description:

This command causes the product to terminate the session.

Syntax:

AT+FK

Parameters:

No parameter

+FBOR – Page transfer bit order

Description:

This command sets the bit order for negotiation and fax page transfer. The order is related to the bit order on radio link.

Syntax:

AT+FBOR=<n>

Parameters:

<n>

	Bit order for negotiation	Bit order for page transfer
0(default)	Same	Same
1	Same	Reverse
2	Reverse	Same
3	Reverse	Reverse

Command example	Possible responses	Note
AT+FBOR=?	(0–3) OK	Test command

+FBUF – Buffer size report

Description:

This command requests the size of the exchange buffer between the modem and the fax application.

NOTE:

Only the read command is supported.

Syntax:

AT+FBUF

Parameters:

No parameter

Command example	Possible responses	Note
AT+FBUF?	1024 OK	Current value

+FCQ – Copy quality checking

Description:

This command controls Copy Quality checking for receiving faxes.

Syntax:

AT+FCQ=<n>

Parameters:

<n>

0: default value, the only supported

Command example	Possible responses	Note
AT+FCQ=?	(0) OK	Test command

+FCR – Capability to receive

Description:

This commands controls the capability of the modem to accept incoming faxes.

Syntax:

AT+FCR=<n>

Parameters:

<n>

0: The modem will not accept incoming faxes.

1: The modem will accept incoming faxes (default value).

Command example	Possible responses	Note
AT+FCR=?	(0,1) OK	Test command

+FDIS – Current sessions parameters

Description:

This command allows the DTE to parameter the capabilities used for the current session.

Syntax:

AT+FDIS=<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Parameters:

This command accepts eight numeric parameters (of the T30 standard).

<vr>

Vertical Resolution,

0: Normal: 98 lpi (default value)

1: Fine: 196 lpi

**
**

Bit Rate

0: 2400 bit/s (modem type V.27 ter)

1: 4800 bit/s (modem type V.27 ter)

2: 7200 bit/s (modem type V.29)

3: 9600 bit/s (modem type V.29, V.17).
Default value if 14.4 kbit/s data feature **is not** supported.

4(*): 12000 bit/s (modem type V.33, V.17)

5(*): 14400 bit/s (modem type V.33, V.17).
Default value if 14,4 kbit/s data feature **is** supported.

(*) Only when product supports 14,4 kbit/s data feature

<wd>

Page Width

0: 1728 pixels in 215 mm (default value)

1: 2048 pixels in 255 mm

2: 2432 pixels in 303 mm

<ln>

Page Length

0: A4, 297 mm

1: B4, 364 mm

2: Unlimited (default value)

<df>

Data Compression Format

0: 1-D modified Huffman (default value)

1: 2-D modified read

2: 2-D uncompressed mode

3: 2-D modified modified read

<ec>

Error Correction,

0: Disable Fax ECM. Default value if fax ECM feature IS NOT supported.

1(*): Enable Fax ECM, 64 bytes/frame

2(*): Enable Fax ECM, 256 bytes/frame. Default value if fax ECM feature IS supported.

(*) Only when product supports fax Error Correction Mode feature

<bf>

Binary File Transfer

Only <bf> 0 is supported.

<st>

Scan Time per line

<st>	**Description if <vr>=0**	**Description if <vr>=1**
0 (default)	0 ms	0 ms
1	5 ms	5 ms
2	10 ms	5 ms
3	10 ms	10 ms
4	20 ms	10 ms
5	20 ms	20 ms
6	40 ms	20 ms
7	40 ms	40 ms

Command example	**Possible responses**	**Note**
AT+FDIS=?	(0,1),(0-5),(0-2),(0-2), (0-3),(0),(0),(0-7) OK	Fax ECM not supported, Fax 14,4 kbit/s supported
AT+FDIS=?	(0,1),(0-3),(0-2),(0-2), (0-3),(0),(0),(0-7) OK	Fax ECM not supported, Fax 14,4 kbit/s not supported

+FDCC – DCE capabilities parameters

Description:

This command allows the DTE to parameter the capabilities used for any session.

Syntax:

AT+FDCC=<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Parameters:

The parameters and default values are the same as for the +FDIS command (see.

Command example	Possible responses	Note
AT+ FDCC=?	(0,1),(0-5),(0-2),(0-2),(0-3), (0-2),(0),(0-7) OK	Test command Fax ECM supported, Fax 14,4 kbit/s supported
AT+ FDCC=?	(0,1),(0-5),(0-2),(0-2),(0-3), (0),(0),(0-7) OK	Test command Fax ECM not supported, Fax 14,4 kbit/s supported
AT+ FDCC=?	(0,1),(0-3),(0-2),(0-2),(0-3), (0-2),(0),(0-7) OK	Test command Fax ECM supported, Fax 14,4 kbit/s not supported
AT+ FDCC=?	(0,1),(0-3),(0-2),(0-2),(0-3), (0),(0),(0-7) OK	Test command Fax ECM not supported, Fax 14,4 kbit/s not supported

+FLID – Local ID string

Description:

This command allows the local ID string to be defined.

Syntax:

AT+FLID=”<string>”

Parameters:

<string>

The string has a limited size of 20 characters, and accepts any characters between 32 and 127 as ASCII codes..

Command example	Possible responses	Note
AT+FLID=?	(20),(32-127) OK	Test command

+FPHCTO – Page transfer timeout parameter

Description:

This command sets the time interval during which the modem expects another page before it assumes there are no more pages and aborts.

Syntax:

AT+FPHCT0=<n>

Parameters:

<n>

Waiting period for another page in seconds.

Range: 0 to 255, default value is 30.

Command example	Possible responses	Note
AT+FPHCTO=?	(0-255) OK	Test command

Fax Class 2 indication messages

The following messages are used to indicate DCE Responses. They are used in communication only.

+FCON:

This response indicates connection with a fax machine.

**+FDCS <vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>**

This response reports current session capabilities. The parameters are the same than those of AT+FDIS command (see 0).

**+FDIS <vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>**

This response reports remote capabilities. The parameters are the same than those of AT+FDIS command (see 0).

<vr>

Combinations of the following values are also allowed.

<vr>	**Coding**
0x01:	R8 x 7.7 l/mm, Fine (196 lpi)
0x02:	R8 x 15.4 l/mm
0x04:	R16 x 15.4 l/mm
0x08:	200 dpi x 100 l/25.4 mm
0x10:	200 dpi x 200 l/25.4 mm
0x20:	200 dpi x 400 l/25.4 mm
0x40:	300 dpi x 300 l/25.4 mm

+FCFR:

This response indicates confirmation to receive.

+FTSI "<string>":

This response reports the received transmit station ID string.

+FCSI "<string>":

This response reports the received called station ID string.

+FPTS <ppr>

This response reports received page transfer status. The parameter is the same than the one of AT+FPTS command (see 0).

+FET <ppm>

This response reports post page message response. The parameter is the same than the one of AT+FET command (see 0).

+FHNG <cause>

This response reports the hang-up cause. It indicates that the call has been terminated.

<cause>

0:	Normal end of connection.
10:	Unspecified transmit phase A error.
20:	Unspecified transmit phase B error.
40:	Unspecified transmit phase C error.
50:	Unspecified transmit phase D error.
70:	Unspecified receive phase B error.
90:	Unspecified receive phase C error.
100:	Unspecified receive phase D error.

V.24-V.25 commands

+IPR – Fixed DTE rate

Description:

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

NOTE:

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

Caution:

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

Syntax

AT+IPR=<rate>

Parameters:

<rate> baud rates that can be used by the DCE

0 (enables autobauding)

300

600

1200

2400

4800

9600

19200

38400

57600

115200

Command example	Possible responses	Note
AT+IPR?	+IPR: 9600 OK	Current rate is 9600 bit/s
AT+IPR=?	+IPR: (0, 2400, 4800, 9600, 19200, 38400, 57600), (300, 600, 1200, 115200) OK	Possible values, according to V25 ter Recommendation: 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	Disable autobauding and set rate to 38400 bit/s
AT+IPR=0	OK	Enable autobauding

+ICF – DTE-DCE character framing

Description:

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

Syntax:

AT+ICF= <format>[, <parity>]

Parameters:

<format>

0: Auto detect (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:

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

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

Command example	Possible responses	Note
AT+ICF?	+ICF: 3,4 OK	Current values
AT+ICF=?	+ICF: (1-6),(0-4) OK	Possible values
AT+ICF=2,0	OK	Set 8 databits Odd parity and 1 stop bit

+IFC – DTE-DCE local flow control

Description:

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

Syntax:

AT+IFC=<DCE_by_DTE>,<DTE_by_DCE>

Parameters:

<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)

NOTE:

When this parameter is set to 2 (DTE invokes flow control through RTS) DCE behavior is as follows:

If the DCE has never detected RTS in the high (or ON) condition since startup, then it ignores RTS (assuming this signal is not connected).

As soon as the DCE detects RTS high the signal acts on it. Therefore subsequent RTS transition to OFF will prevent the DCE from sending any further data in both online and offline modes.

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

<DTE_by_DCE>

0: none (supported)

1: Xon/Xoff circuit 104 (not supported)

2: CTS (supported)

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

Command example	Possible responses	Note
AT+IFC?	+IFC: 2,2 OK	Current values
AT+IFC=?	+IFC: (0,2),(0,2) OK	Possible values
AT+IFC=0,0	OK	New values, No flow control

&C – Set DCD signal

Description:

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

NOTE:

GDW-xx slightly differ from V25ter Recommendation. DCD signal ("Circuit 109") is turned ON at the same time the CONNECT message is sent, whereas the specification states the DCD should be turned ON after the CONNECT message was received.

Syntax:

AT&C<n>

Parameters:

<n>

0: DCD always on

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

Command example	Possible responses	Note
AT&C0	OK	DCD always on
AT&C1	OK	DCD follows the state of the modem's data carrier

&D – Set DTR signal

Description:

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

Syntax:

AT&D<n>

Parameters:

<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

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

&S – Set DSR signal

Description:

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

Syntax:

AT&S<n>

Parameters:

<n>

0: DSR always on

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

Command example	Possible responses	Note
AT&S0	OK	DSR always on
AT&S1	OK	DSR off in command mode, DSR on in data mode

O – Back to online mode

Description:

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

Syntax:

ATO

Parameters:

No parameter

Command example	Possible responses	Note
ATO	OK	Return from offline mode to online mode

Q – Result code suppression

Description:

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

Syntax:

ATQ<n>

Parameters:

<n>

0: DCE transmits result codes

1: Result codes are suppressed and not transmitted

Command example	Possible responses	Note
ATQ0	OK	DCE transmits result codes
ATQ1		Result codes are suppressed and not transmitted

V – DCE response format

Description:

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

Syntax:

ATV<n>

Parameters:

<n>

0 (Information responses):	<text><CR><LF>
0 (Result codes):	<numeric code><CR>
1 (Information responses):	<CR><LF><text><CR><LF>
1 (Result codes):	<CR><LF><verbose code><CR><LF>

Command example	Possible responses	Note
ATV0	0	DCE transmits limited headers and trailers and numeric result codes
ATV1	OK	DCE transmits full headers and trailers and verbose response text

Z – Default configuration

Description:

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

Syntax:

ATZ

Parameters:

No parameter

Command example	Possible responses	Note
ATZ	OK	Command valid

&W – Save configuration

Description:

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

Syntax:

AT&W

Parameters:

No parameter

Command example	Possible responses	Note
AT&W	OK	Writes current configuration to EEPROM

&T – Auto-tests

Description:

This command allows to trigger various auto-tests.

Syntax:

AT&T<n>

Parameters:

<n>

0: Perform software auto-tests
The response will be OK if no software problem is detected (EEPROM, RAM and ROM checksums), otherwise a simple ERROR response is sent.

1: Do the audio loop test (close)
This is used to validate the audio loop (microphone to speaker).

2: Stop the audio loop test (open)
This is used to validate the audio loop (microphone to speaker).

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

E – Echo

Description:

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

Syntax:

ATE<n>

Parameters:

<n>

0: Characters are not echoed

1: Characters are echoed

Command example	Possible responses	Note
ATE0	OK	Characters are not echoed
ATE1	OK	Characters are echoed

&F – Restore factory settings

Description:

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

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

Syntax:

AT&F[<n>]

Parameters:

<n>

0: restore factory setting

No other value supported

Command example	Possible responses	Note
AT&F	OK	Ask for restoring the factory settings
AT&F0	OK	Ask for restoring the factory settings

&V – Display configuration

Description:

This command is used to display the modem configuration.

Syntax:

AT&V<n>

Result Syntax:

The parameters displayed are the following:

Q, V, S0, S2, S3, S4, S5,

+CR, +CRC, +CMEE, +CBST,

+SPEAKER, +ECHO, &C, &D, %C

+IPR, +ICF, +IFC9

Parameters:

<n>

0: Display the modem configuration in RAM. (default value if no parameter provided)

1: Display the modem configuration in EEPROM.

2: Display the modem factory configuration.

Command example	Possible responses	Note
AT&V	Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008 +CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1 +SPEAKER:0 +ECHO:0,0 &C:1 &D:2 %C:0 +IPR:9600 +ICF:3,4 +IFC:2,2 OK	Display active parameters in RAM

I – Request identification information

Description:

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

Syntax:

ATI<n>

Parameters:

<n>

0: Display manufacturer followed by model identification. (equivalent to +CGMI and +CGMM, refer to these commands for more precisions).
3: Display revision identification (equivalent to +CGMR).
4: Display modem configuration in RAM (equivalent to &V0).
5: Display modem configuration in EEPROM (equivalent to &V1).
6: Display modem data features. Lists the supported data rates, data modes, and fax classes.
7: Display modem voice features.
9: Display revision identification

Other values: "OK" string is sent back.

Command example	Possible responses	Note
ATI0	WESTERMO MODEM 900P OK	Manufacturer and model identifications
ATI3	440_09gm.Q2406A 1266500 020503 17:06 OK	Revision identification Software release 4.40, generated on the 05th of February 2003
ATI6	DATA RATES: AUTOBAUD,300,1200, 1200/75,2400,4800,9600,14400 DATA MODES: T/NT, ASYNCHRONOUS FAX CLASS 1,2 OK	Modem data features
ATI7	SPEECH CODINGS: FR,EFR,HR,AMR OK	Modem voice features
ATI8	Switch1: 0000	Switch settings for GDW-11
ATI8	Switch1: 0000 Switch2: 00000000 Switch3: 00000000	Switch settings for GDW-12
ATI9	4100-xxxx	Westermo SW release

+WMUX – Data / Commands Multiplexing

Description:

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

Syntax:

AT+WMUX=<mode>

Parameters:

<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).

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

Specific AT commands

+CCED – Cell environment description

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 ascertain these cell parameters:

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

Automatic mode is not supported during registration.

Syntax:

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

Parameters:

<mode>

0: One shot requested

1: Automatic shots requested

2: Stop automatic shots

<requested dump>

1: Main Cell:

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

2: Neighbour1 to Neighbour6:

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

4: Timing Advance

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

NOTE:

- The response for the requested dump 1, 2 and 4 will be:
  +CCED:<value1>, . . . , <valuen>
  OK

  where <value> is the ASCII string of the values (in decimal form except the LAC and CI values which are in hexadecimal form) of the parameters. If a field cannot be measured – or is meaningless – the parameter is not filled in, and two consecutive commas are sent.
- The response for the requested dump 8 will be a +CSQ response and not a +CCED response. The 07.07 format for +CSQ is respected. The <ber> is not evaluated by this command, so the <ber> value will always be 99.

  +CSQ:<rssi>, 99

  OK

  When automatic shots are selected, this +CSQ response is sent every time the <rssi> measured by the product changes. Automatic shots are supported in idle mode and during communication. The activation or deactivation of this flow (8) does not affect the other flows.
- In idle mode, only RxLev measurements (on the main cell and on the neighboring cells) are made.
- Combination of the requested dump is supported (addition of the values 1, 2, 4 and 8):

<Value>

1: +CCED response: Main Cell only
2: +CCED response: Neighbors 1 to 6
3: +CCED response: Main Cell, then Neighbors 1 to 6
4: +CCED response: Timing Advance only
5: +CCED response: Main Cell, then Timing Advance
6: +CCED response: Neighbors 1 to 6, then Timing Advance
7: +CCED response: Main Cell, then its Timing Advance, then Neighbors 1 to 6, with each Timing Advance inserted between cells results
8: +CSQ response: Main Cell RSSI indications
9: +CSQ response, then +CCED response with Main Cell only
10: +CSQ response, then +CCED response with Neighbors 1 to 6
11: +CSQ response, then +CCED response with Main Cell, then Neighbors 1 to 6
12: +CSQ response, then +CCED response with Timing Advance only
13: +CSQ response, then +CCED response with Main Cell, then Timing Advance
14: +CSQ response, then +CCED response with Neighbors 1 to 6, then Timing Advance
15: +CSQ response, then +CCED response with Main Cell, then its Timing Advance, then Neighbors 1 to 6, with each Timing Advance inserted between cells results

No value: Last value used for a CCED request, or 15

- If <requested dump> parameter is not provided, the one of the last +CCED command will be used, or 15 (default value).
- Values of MCC/MNC are set to 0 in the case of "No service".

Command example	Possible responses	Note
AT+CCED=0	+CCED:208,20,0002,0418, 37,706,24,,,0,,,0, 208,20,0006, 989b,37,835,20,208,20,0002, 02a9, 37,831,12,208,20,0101, 7966,34,818,13,208,20, 0006,9899,39,713,9,208,20, 0002,0a72,33,711, 12,208,20, 0101,03fb,36,824,10,1 OK	last request was AT+CCED=0,3 (main cell and neighbors 1 to 6): you can see MCC,MNC sequences (here 208,20)
AT+CCED=0,1	+CCED:208,20,0002,0418,37, 706,25,,,0,,,0 OK	Only Main cell request
AT+CCED=0,1	+CCED:208,10,189C,,19,85,, 31,32,,0,0, OK	Call in progress: RXLev and RXQual are empty, RxLevFull, RxLevSub, RxQualFull and RxQualSub have data

+WIND – General Indications

Description:

This command provides the user with a general mechanism to send unsolicited non-standardized indications to the application. These indications are:

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

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

Syntax:

AT+WIND= <IndLevel >

Result Syntax:

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>"]

Parameters:

<IndLevel>

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

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): network or other party has released an active, held or waiting call

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

Combination (addition of the values) is used to allow more than one indication flow: 0 IndLevel ≤ 16383

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

The supported events are:

<event>

0: The SIM presence pin has been detected as "SIM removed"

1: The SIM presence pin has been detected as "SIM inserted"

2: Calling party is alerting

3: Product is ready to process AT commands (except phonebooks, AOC, SMS), at init or after AT+CFUN=1

4: Product is ready to process all AT commands, end of phonebook init or swap (FDN to ADN)

5: Call <idx> has been created (after ATD or +CCWA)

6: Call <idx> has been released, after a NO CARRIER, a +CSSU: 5 indication, or after the release of a call waiting

7: The network service is available for an emergency call.

8: The network is lost.

9: Audio ON.

10: Show reload status of each SIM phonebook after init phase (after Power-ON or SIM insertion).

11: Show the checksum of SIM phonebooks after loading

12: An interruption has occurred

13: The rack has been detected as Closed.

14: The rack has been detected as Opened.

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

for event 10:

<phonebook>

"SM"

"FD"

"ON"

"SN"

"EN"

<status>

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

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

for event 11:

<checksum>

128-bit "fingerprint" of the phonebook.

NOTE:

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

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

<Local time zone>

String, Universal Time and Time Zone , in format "yy/MM/dd,hh:mm:ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone).

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 (Day 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 NITZ indication, all the fields indicated here are optional. That is why there is an index related to each information:

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

Refer to 3GPP TS 24.008, 3GPP TS 23.040, 3GPP TS 22.042 for more information.

Command example	Possible responses	Note
AT+WIND?	+WIND: 0 OK	
AT+WIND=255	OK	
	+WIND: 0	The SIM has been removed
	+WIND: 1	The SIM has been inserted
	+WIND: 7	The network service is available for an emergency call
	+WIND: 4	The initialization has been completed
	+WIND: 15,1,"Cingular Extend",2,"Cingular",3,"+08",4, "03/14/27,16:59:48+08",5, "123456",6,"2"	The modem received a NITZ information message

+WLPR – Read Language Preference

Description:

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

Syntax:

AT+WLPR= <index >

Response syntax:

+WLPR: <value>

Parameters:

<index>

offset in the available languages range (SIM dependant).

<value>

Example of values for language: (see Recommendation 3GPP TS 23.038)

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

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

+WLPW – Write Language Preference

Description:

Write a Language Preference value in EF-LP

Syntax:

AT+WLPW=<index >,<value>

Response syntax:

OK or +CME ERROR: <err>

Parameters:

<index>

offset in the available languages range (SIM dependant).

<value>

See <value> examples in +WLPR command.

Command example	Possible responses	Note
AT+WLPR?	+WLPR: 4 OK	Read command Four language preferences are available in EF-LP
AT+WLPR=1	+WLPR: 5 OK	Read first EF-LP index value Language preference is 5
AT+WLPW=1,5	OK	Write Lang Pref equal to 5 in EF-LP with index 1

+WAC – Abort command

Description:

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

Syntax:

AT+WAC

Parameters:

No parameter

Command example	Possible responses	Note
AT+COPS=?		Display available PLMN takes some time to execute
AT+WAC	OK	Abort the request of PLMN list before the command is finished

+WDWL – Downloading

Description:

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

NOTE:

Software damages may occur if power is lost or if an hardware reset occurs during the downloading phase. This would seriously affect modem behavior.

Syntax:

AT+WDWL

Parameters:

No parameter

Command example	Possible responses	Note
AT+WDWL	+WDWL: 0	Switch on downloading mode
	...	Downloading in progress, the control character transmitted may appear different depending on terminal type
AT+CFUN=1	OK	Reset the product at the end Reset completed, new software running
AT+WDWL?	+WDWL:V01.19 OK	Display downloader version

+WDR – Data Rate

Description:

This command allows the data rate for bearer data to be configured for outgoing and incoming calls.

Syntax:

AT+WDR=<out_coding_type>[,<in_coding_type>]

AT+WDR=[<out_coding_type>],<in_coding_type>

Response Syntax:

+WDR: <out_coding_type>,<in_coding_type>

NOTE:

<out_coding_type> is related to outgoing calls, and <in_coding_type> to incoming calls.

Parameters:

<out_coding_type>

0: FR
1: HR, other supported types: FR
2: FR, other supported types: HR

<in_coding_type>

0: HR
1: FR

Command example	Possible responses	Note
AT+WDR=?	+WDR: (0-2),(0-1) OK	If Half Rate available in both directions
AT+WDR=?	+WDR: (0),(1) OK	If Half Rate not available.
AT+WDR=1	OK	Configure data type FR, HR with HR preferred, for outgoing calls (<in_coding_type> parameter is omitted)
AT+WDR=,1	OK	Configure data type FR for incoming calls (<out_coding_type> parameter is omitted)
AT+WDR=3	+CME ERROR: 3	Illegal value
AT+WDR?	+WDR: 1,1 OK	Ask for the current value

+WHWV – Hardware Version

Description:

This command gets the hardware version of the GSM engine.

Syntax:

AT+WHWV

Parameters:

No parameter

Command example	Possible responses	Note
AT+WHWV	Hardware Version 4.14 OK	Request Hardware Version

+WDOP – Date of Production

Description:

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

Syntax:

AT+WDOP

Parameters:

No parameter

Command example	Possible responses	Note
AT+WDOP	Production Date (W/Y): 01/2000	
	OK	Request Date of Production of the GSM engine

+WSTR – Status Request

Description:

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

Syntax:

AT+WSTR=<status>

Response syntax:

+WSTR: <status>,<value>

Parameters:

<status>

1: Initialization sequence

<value>

0: Not started
1: On going
2: Finished
2: Network status

<value>

0: No network
1: Network available

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

+WSCAN – Scan

Description:

This command displays the received signal strength indication (<rssi>) for a specified frequency (in absolute format).

This command is not allowed during communication.

Syntax:

AT+WSCAN=<absolute frequency>

Response syntax:

+WSCAN: <rssi>

Parameters:

<absolute frequency>

frequency in absolute format<rssi>

0: –113 dBm or less
1: –111 dBm
2-30: –109 to –53 dBm
31: –51 dBm or more
99: not known or not detectable

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

+WRIM – Ring Indicator Mode

Description:

This command sets the state of the Ring Indicator Mode.

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

Syntax:

AT+WRIM=<mode>[,<n>]

Parameters:

<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 30µs. 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.

Command example	Possible responses	Note
AT+WRIM=0	OK	Select up-down RI mode
AT+WRIM=1	OK	Select pulse RI mode
AT+WRIM=2,0	OK	Select mode pulse RI + Pulse on downloaded packet, pulse duration is 5µs
AT+WRIM=?	+WRIM: (0-2) OK	possible values
AT+WRIM?	+WRIM: 1 OK	current value

+WSSW – Software version

Description:

This command displays some internal software reference.

Syntax:

AT+WSSW

Parameters:

No parameter

Command example	Possible responses	Note
AT+WSSW	A00_00gm.2c 000000008F5DC6EA OK	Get Software version
AT+WSSW=?	OK	

AT*WRECALL – Recall Settings

Description:

This command recalls saved settings just as after power off/on reboot. The recall command is valid for the following commands:

*WGPRSAPN, *WGPRSUN, *WGPRSPW, *WTCPCONNECT, *WTCPI, *WPIN, *WTCPPORT, *WTCPTXDELAY, *WTCPSERV, *WTCPMODE, *WTCPDLEMODE.

Syntax:

AT*WRECALL

Command example	Possible responses	Note
AT*WTCPPORT?	AT*WTCPPORT: 9000 OK	Current value (not saved)
AT*WRECALL	OK	Restore saved value.
AT*WTCPPORT?	AT*WTCPPORT: 7232 OK	Saved value

+WCCS – Custom Character Set

Description:

This command allows to edit and display the custom character set tables. These tables are used by the "CUSTOM" mode of +CSCS and the +WPCS commands. In this CUSTOM mode, when the user enters a string, it is converted into GSM alphabet using the Custom to GSM table. In a similar way, when the user requests a string display, the string is converted from GSM alphabet using the 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 be equal to the edition range requested, otherwise the command will return "+CME ERROR: 24".

The default Custom alphabet extension table contains the following extended characters:

|	^	_	{	}	[	]	~	\

Syntax:

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

Parameters:

<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

NOTE:

- <char1> and <char2> are not ASCII codes, they stand for the range of a given character in the tables.
- If only <char1> is provided, only this char is displayed/edited.

See section for informative examples about the use of these characters.

Command example	Possible responses	Note
AT+WCCS=0,0,120,130	+WCCS: 11, 78797A2020202020097E05 OK	Display from character 120 to character 130 of the Custom To GSM conversion table
AT+WCCS=1,0,115<CR> 20<ctrl-Z>	OK	Edit character 115 of the Custom To GSM conversion table
AT+WCCS=1,1,0,4<CR> 40A324A5E8<ctrl-Z>	OK	Edit the 5 first characters of the Custom alphabet table
AT+WCCS=0,2,20<CR>	+WCCS: 1,5E OK	Display character 20 of the Custom alphabet extension table
AT+WCCS=1,1,200	+CME ERROR: 3	Edit character 200 of Custom alphabet table Index out of range

+WLCK – Lock command

Description:

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

NOTE:

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

Syntax:

AT+WLCK=<fac>,<passwd>,<NetId>[,<GID1>[,GID2]] [,<CnlType>[,<CnlData>]]

Response syntax:

+WLCK: <status>

Parameters:

<fac>

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

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

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

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

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

<CnlType>

Type of lock for cooperative network list (CNL)

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

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

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

<CnlData>

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

NOTE:

Only if <CnlType> = 1

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

+CPHS – CPHS command:

Description:

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

NOTE:

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

Syntax:

AT+CPHS=<Mode>,<FctId>[,<precision>]

Response Syntax:

+CPHS: <FctId1>,<Status><CR<LF>
+CPHS: <FctId2>,<Status><CR<LF>

Parameters:

<Mode>

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

NOTE:

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

<FctId>

1: Voice Mail Indicator (not supported)
2: Mail Box Number
3: Alternate Line Service
4: Diverted Call Indicator
5: Network Operator Name
6: CPHS Information
7: Customer Service Profile

NOTE:

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

<precision>

only used if <Mode>=2 and <FctId>= 5 to 7

if <FctId>=5, this field is <type format> (See +WNON)

if <FctId>=6, this field is <data field> (See +WCPI)

if <FctId>=7, this field is <service> (See +WCSP)

<Status>

0: CPHS feature disabled

1: CPHS feature enabled

Command example	Possible responses	Note
AT+CPHS?	+CPHS: 1,0 +CPHS: 2,0 +CPHS: 3,1 +CPHS: 4,0 +CPHS: 5,1 +CPHS: 6,1 +CPHS: 7,1 OK	Interrogate the status of CPHS functionality The voice mail indicator functionality is deactivated The mail box number functionality is deactivated The Alternate Line Service functionality is activated The Divert Call Indicator functionality is deactivated The Network Operator Name functionality is activated The CPHS Information functionality is activated The Customer Service Profile functionality is activated
AT+CPHS=3.1	+CME ERROR: 3	Syntax error
AT+CPHS=1.1	OK	Activate the voice mail indicator functionality

Command example	Possible responses	Note
AT+CPHS?	+CPHS: 1,1 +CPHS: 2,0 +CPHS: 3,1 +CPHS: 4,0 +CPHS: 5,1 +CPHS: 6,1 +CPHS: 7,1 OK	Interrogate the status of CPHS functionality The voice mail indicator functionality is activated The mail box number functionality is deactivated The Alternate Line Service functionality is activated The Divert Call Indicator functionality is deactivated The Network Operator Name functionality is activated The CPHS Information functionality is activated The Customer Service Profile functionality is activated
	+WVMI: 1,1	The message box contains 1 message A message is waiting on Line 1
	+WVMI: 2,1	The message box contains a second message A message is waiting on Line 2
AT+CPHS=1,4	OK	Activate the divert call indicator functionality
	+WDCI: 1,1	The call forwarding is active on Line 1 Call forwarding is activated on Line 1
AT+CPHS=1,2	OK	Activate the mail box number functionality

Command example	Possible responses	Note
AT+WALS=1	+WALS: 2 OK	Interrogate the status of activated Line The current line is number 2
AT+CPHS=0,4	OK	Deactivate the divert call indicator functionality
AT+CPHS?	 +CPHS: 1,1 +CPHS: 2,1 +CPHS: 3,1 +CPHS: 4,0 +CPHS: 5,1 +CPHS: 6,1 +CPHS: 7,1 OK	Interrogate the status of CPHS functionality The voice mail indicator functionality is activated The mail box number functionality is activated The Alternate Line Service functionality is activated The Divert Call Indicator functionality is deactivated The Network Operator Name functionality is activated The CPHS Information functionality is activated The Customer Service Profile functionality is activated
AT+CPHS=2,2	 +WMBN: 1,"19254871234",129,,1 +WMBN: 2,,,1 +WMBN: 3,,,1 +WMBN: 4,,,1 OK	Query current mail box numbers in SIM Mail box number for Line 1 Mail box number for Line 2 Mail box number for Data Line Mail box number for Fax Line Only Line1 can be updated

+WNON – network operator name

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.

Syntax:

AT+CPHS=2,5[,<type format>]

Response syntax:

+WNON:<type format>,<operator name>

Parameters:

<type format>

0: Long format operator name

1: Short format operator name (default value)

<operator name>

The name of the operator, in long or short format

Command example	Possible responses	Note
AT+CPHS=2,5	+WNON: 0,"Orange F" OK	Get the operator name
AT+CPHS=2,5,1	+WNON: 1,"Orange" OK	Get the short format operator name.
AT+CPHS=2,5,0	+CME ERROR: 3	When CPHS Feature is not allowed or format name no accessible
AT+CPHS=2,5,1	+CME ERROR: 3	When NON Feature is not allowed or format name no accessible
AT+CPHS=0,5	OK	Deactivation of Network Operator Name feature.

+WCPI – CPHS information

Description:

This indication provide CPHS information; i.e. which data field are present in the SIM. This command is the response to the AT+CPHS 2,6[,<data field>] command.

Syntax:

AT+CPHS=2,6[,<data field >]

Response syntax:

+WCPI: <data field>,<status>

Parameters:

<data field>

value indicating the field of CPHS information

If <precision> field omitted in the AT+CPHS command, all field of CPHS Info will be displayed.

<status>

0: data field is set
1: data field is unset

When all CPHS information are requested, the status correspond to a bit field

NOTE:

The field CSP service (<data field> = 1) is used to set or not the CSP feature at the initialization.

Command example	Possible responses	Note
AT+CPHS=2,6	+WCPI: 0,"0033000F" OK	Get the current status for all CPHS info field
AT+CPHS=2,6,13	+WCPI: 13,1 OK	Get the current status for Call Forward Activated indicator for Line 1.
AT+CPHS=2,6,22	+WCPI: 22,0 OK	Get the current status for Line 2 Mailbox number. Mailbox number for Line 2 is not available.
AT+CPHS=2,6,17	+CME ERROR: 3	Wrong data field
AT+CPHS=2,6,22	+CME ERROR: 3	Get the current status for Line 2 Mailbox number. CPHS Feature is not allowed
AT+CPHS=0,6	OK	Deactivation of CPHS Info feature. No effect.

+WCSP – customer service profile

Description:

This indication indicates if a service is accessible to the customer. This is the response to the AT+CPHS 2,7,<service > command.

Syntax:

AT+CPHS=2,7,<service>

Response syntax:

+WCSP: <service>,<status>

Parameters:

<service>

value indicating the field of CSP field to display (see appendix, column External Value)

<status>

0: service is not customer-accessible
1: service is customer-accessible

NOTE:

The field Alternate Line Service (CPHS Teleservices Group) is used to set or not the ALS feature at the initialization.

Command example	Possible responses	Note
AT+WCSP=?	ERROR	
AT+WCSP?	ERROR	
AT+CPHS=2,7	+CME ERROR: 3	Syntax error
AT+CPHS=2,7,9	+WCSP: 9,1 OK	Get the current status for Barring of All Outgoing Calls. Barring of All Outgoing Calls is customer accessible.
AT+CPHS=2,7,11	+WCSP: 11,1 OK	Get the current status Barring of Outgoing International Calls Barring of Outgoing International Calls is customer accessible.

Command example	Possible responses	Note
AT+CPHS=2,7,2	+CME ERROR: 3	Get the current status Call forwarding on user Busy. CPHS Feature is not allowed
AT+CPHS=0,7	OK	Deactivation of CPHS Info. No effect.

+WMBN – CPHS Mail Box Number

Description:

This command sets the different mailbox numbers in SIM. The +CPHS command can be used to know which mailbox numbers can be updated.

Syntax:

AT+WMBN = <LineId>,<number>,<type>,<name>

Response syntax

To AT+CPHS=2,2

+WMBN = <LineId>,<number>,<type>,<name>,<status>

Parameters:

<LineId>

1: Line 1

2: Line 2

3: Data

4: Fax

<number>

Phone number in ASCII format.

<type>

TON/NPI

(Type of address byte in integer format).

<name>

name of mailbox.

NOTE:

For the <name> parameter all strings starting with "80", "81" or "82" are considered in UCS2 format. See the APPENDIX E: Coding of Alpha fields in the SIM for UCS2. If a wrong UCS2 format is entered, the string is considered as an ASCII string.

The AT command +WPCS affect the format of the Mailbox <name> entry.

<status>

When checked with "AT+CPHS=2,2", it indicates if the number can be updated or not:

0: Update is not possible

1: Update is possible

Command example	Possible responses	Note
AT+WMBN=?	OK	
AT+WMBN?	OK	
AT+CPHS=2,2	+WMBN: 1,"0123456789", 129,"Maison",1 +WMBN: 2,"9876543210", 129,"Travail",1 +WMBN: 3,,,,1 +WMBN: 4,,,,1 OK	Get the current Mail Box Numbers in SIM
AT+WMBN=1, "+33122334455",145	OK	Set mailbox number for line1.
AT+WMBN=2	OK	Erase mailbox number & name for line2
AT+CPHS=2,2	+WMBN: 1,"+33122334455", 145,,1 +WMBN: 2,,,,1 +WMBN: 3,,,,1 +WMBN: 4,,,,1 OK	Get the current Mail Box Numbers again

+WOPEN – Open AT control command

Description:

This command allows to start, stop, delete and get information about the current Open AT embedded application.

Note: This command is only available if the Open AT feature is enabled (see +WCFM command).

Syntax:

AT+WOPEN=<Mode>

Response syntax:

+WOPEN: <Mode>[,<IntVersion>[,<ExtVersion>]]

Parameters:

<Mode>

0: Stop the Open-AT embedded application. If the product was running, it resets.
1: Start the Open-AT embedded application. If the product was stopped, it resets.
2: Get the Open AT library versions.
3: Erase the objects flash of the Open-AT embedded application.
4: Erase the Open-AT embedded application.
5: Suspend (in WESTERMO software kernel) the Open AT embedded application tasks.

NOTE:

Mode = 3 and 4 are only available if Open-AT embedded application is stopped (AT+WOPEN=0).

Open AT embedded applications can be resumed with AT+WOPENRES command or the INTERRUPT feature (see +WCFM command).

<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.

Command example	Possible responses	Note
AT+WOPEN=?	+WOPEN: (0-5) OK	
AT+WOPEN?	+WOPEN: 0 OK	
AT+WOPEN=2	+WOPEN: 2,"AT v2.00","AT v2.00" OK	Get the Open-AT library versions.
AT+WOPEN=3	OK	The objects flash are erased
AT+WOPEN=1	OK +WIND: 3	Start the embedded application. Product reset in order to start the embedded application.
AT+WOPEN = 3	+CME ERROR: 532	The embedded application is activated so the objects flash are not erased.
AT+WOPEN = 4	+CME ERROR: 532	The embedded application is activated so it cannot be erased
AT+WOPEN=0	OK +WIND: 3	Stop the embedded application. Product reset in order to stop the embedded application.
AT+WOPEN=3	OK	The objects flash are erased
AT+WOPEN=4	OK	The embedded application is erased
AT+WOPEN?	+CME ERROR: 3	The Open AT feature is disabled.
AT+WOPEN=5	OK	Suspend Open AT tasks
AT+WOPEN?	+WOPEN:5 OK	

+WRST – Reset command

Description:

This command resets the modem after the time specified by the <delay> parameter.

Syntax.

AT+WRST =<Mode>,<Delay>

Response syntax:

+WRST: <Mode>,<Delay>,<RemainTime>

Parameters:

<val1>

0: timer reset is disabled
1: timer reset is enabled

<Delay>

sets the time before reset
Range “000:01”- “168:59” (format hhh:mm)

<RemainTime>

time before next reset
Range “000:01”- “168:59” (format hhh:mm)

Command example	Possible responses	Note
AT+WRST=?	OK	
AT+WRST=0	OK	Disable timer
AT+WRST=1,”001:03”	OK	Enable timer and set delay at 1 hour 3 minutes
AT+WRST?	+WRST: 1,”001:03”,”001:01” OK	Timer activated to reset after 1 hour and 3 minutes. At this point, 1 hour and 1 minute remain before next reset.

+WLOC – Location information

Description:

This command can be used by the application to retrieve the following local information: MCC-MNC, LAC, CI, Network measurement, BCCH channel list, Timing Advance, Date and Time.

Two ways exist for the external application to get these information: on request of the application, or automatically by the modem every x seconds (x has to be a multiple of 5 different from 0).

The location feature has to be activated to get information.

if the feature is not activated, ”ERROR” is sent.

If the data are not valid at the requested time, the network measurement, BCCH list and Timing Advance cannot be displayed (“,,” is displayed instead).

Syntax:

AT+WLOC =< mode > [,< time period/dump >]

Response Syntax:

AT+WLOC?
+WLOC: <mode>,<timeperiod>,<dump>

Parameters:

<mode>

0: Stop automatic shots
1: One shot requested
2: Automatic shots requested (every x seconds)
3: Configuration of the wished information

for <mode> = 2:

<time period>

(Optional parameter) range: [5 – 255] in seconds it has to be a multiple of 5.
Default value of time period: 5 seconds

The automatic mode for location is saved in EEPROM, so will be taken into account after an Init (+WLOC: . . . will be displayed).

Coding of the response to AT+WLOC=1 or AT+WLOC=2:

The format of these fields is as specified in 04.08:

Parameter	Type
MCC-MNC	3 bytes
LAC	2 bytes
CI	2 bytes
Network measurement	16 bytes
BCCH channel list	Maximum 48 bytes (if version V0 of GSM Rec 11.14-800) Or 129 bytes (if version V1 of GSM Rec 11.14-800). The version number in indicated in TERMINAL PROFILE information in EEPROM. It is not user-customizable. It is configured at production-time.
Timing Advance	1 byte
Date and Time	7 bytes: Date, time and time zone at STLK Format

For mode = 3:

<dump>

(Optional parameter)

Range: [1-255] (at least 1 bit set to 1).

-if bit 0 set to 1 (value 1): DaT will be returned in the response
-if bit 1 set to 1 (value 2): TA will be returned in the response
-if bit 2 set to 1 (value 4): BCCH will be returned in the response
-if bit 3 set to 1 (value 8): NetMeas will be returned in the response
-if bit 4 set to 1 (value 16): CI will be returned in the response
-if bit 5 set to 1 (value 32): LAC will be returned in the response
-if bit 6 set to 1 (value 64): MNC-MCC will be returned in the response

NOTE:

- After having downloaded the EEPROM configuration: default value of <dump> is 0xFF (all information returned).
- The <dump> value set with the command "at+wloc= 3,xx" is saved in EEPROM, so it will be taken into account after an Init.
- See Appendix C for details on BCCH channel list.

Command example	Possible responses	Note
AT+WLOC=0	OK	Stops the display of local information
AT+WLOC=3,255	OK	Set the wished information to display (255 -> complete information)
AT+WLOC=1	+WLOC: 02f802,0006, 7772, f13101b04cf51278 91138e95a846d160, 8b49d08d0797c419e 272e10889a000009302 170399020403c1020a03c	Displays once the local information
	5020a03, 00,010121111349ff OK	
AT+WLOC=2,6	+CME ERROR:3	6 is not a multiple of 5

Command example	Possible responses	Note
AT+WLOC=2,10	OK +WLOC: 02f802,0006,7772, ed3001af4cf492780 b040889c74acc23,8b49d08 d0797c419e272e1 0889a00000930216039902 0503c1020a03c5020 a03,00,010121111354ff +WLOC: 02f802,0006,7772, f02d01ae4cf41278 4b03c889c846dba5,8b49d 08d0797c419e272e10889a 000009302170399020 403c1020a03c5020903,00, 010121111404ff ...	Displays OK then the current local information immediately for the first time and then every 10 seconds.
AT+WLOC=?	+CME ERROR:3	The feature “loca” is not activated
AT+WLOC?	+CME ERROR:3	The feature “loca” is not activated
AT+WLOC=?	OK	The feature “loca” is activated
AT+WLOC?	+WLOC: 0,5,255 OK	The location is not in mode automatic, the period value is set to 5 seconds, the configuration value is set to 255
AT+WLOC?	+WLOC: 1,10,20 OK	The location is in mode automatic, the period value is set to 10 seconds, the configuration value is set to 20

+WATH – Hang-up command

Description:

This command is used by the application to disconnect the remote user, specifying a release cause and the location. In the case of multiple calls, all calls are released (active, on-hold and waiting calls).

Syntax:

AT+WATH=<RelCause>,<location>

Parameters:

<RelCause>

Decimal value from 1 to 127 (see the table in appendix 18.4 "Failure Cause from GSM 04.08 recommendation)

<location>

Optional parameter (default value =0). values as defined in 04.08

0: user
1: private network serving the local user
2: public network serving the local user
3: transit network
4: public network serving the remote user
5: private network serving the remote user
7: international network
10: network beyond inter-working point

NOTE:

In order to have a "Normal Release", use ATH command

Command example	Possible responses	Note
AT+WATH=31	OK	Ask for disconnection with release cause=normal and location=USER
AT+WATH=?	+WATH: (1-127),(0-5,7,10)	
AT+WATH=17,2	OK	Ask for disconnection with release cause=user busy and location= public network serving the local user

+WMBS – multi-band selection command

Description:

This command permits to select the GSM bands on which the modem has to work. This command is allowed only if the selected bands are supported.

The user can choose if the change is immediate or not:

either the modem has to be reset to take this change into account (this is the default case)

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.

Syntax:

AT+WMBS=<Band>[,<param>]

Response syntax:

+WMBS: <Band>,<ResetFlag>

Parameters:

<Band>

Frequency band configuration to be supported

0: mono-band mode 850 MHz
1: mono-band mode 900 extended MHz (900E)
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 to start on specified band(s). <ResetFlag> is set to 1.

1: The change is effective immediately: the GSM stack is restarted with specified band(s). <ResetFlag> stays at 0. This mode is forbidden while in communication and during modem initialization.

NOTE:

If <Param> is not given, the modem has to be reset to start on 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".

Command example	Possible responses	Note
AT+WMBS=<Band>	OK	Modem has to be reset for change to be effective.
AT+WMBS=<Band>,0	OK	Modem has to be reset for change to be effective.
AT+WMBS=<Band>,1	OK	Band mode selected and GSM stack restarted.
AT+WMBS=<Band>	+CME ERROR: 3	Band not allowed
AT+WMBS=?	+WMBS: (0,3,4),(0-1) OK	Only 850 mono-band or 850-1900 bi-band are available
AT+WMBS=?	+WMBS: (0,1,2,3,4,5,6),(0-1) OK	all bands are available

+WMSN – GSM engine Serial Number

Description:

This command returns the serial number of the GSM engine

Syntax:

AT+WMSN

Parameters:

No parameters.

Command example	Possible responses	Note
AT+WMSN	Serial Number 12345678901234567 OK	Serial number present in Non Volatile Memory is 12345678901234567
AT+WMSN=?	OK	

+WBHV – Modem Behavior Configuration

Description:

This command allows the user to configure the behavior of WESTERMO modem.

If parameter 1 = 0, the command is useful to configure the way the modem responds on outgoing voice calls:

The modem response may be sent when the call is established (default mode), or when the audio path is opened.

If parameter1 = 1, the behavior at init is normal, powerless (airplane mode) or low power consumption. In the powerless case, no calls (even emergency calls) are available.

Syntax:

AT+WBHV = <parameter1>,<parameter2>

Parameters:

<parameter1>

Mode, 0 – 1

0: configure modem response on outgoing voice calls (default value)
<parameter2> modem response sending (with parameter1 = 0)
0: modem response sent on call establishment (default value)
1: modem response sent when audio path is opened
1: configure modem mode
<parameter2> modem init mode (with parameter1 = 1)
0: modem init mode is normal (default value)
1: modem init mode is powerless (airplane mode : start the modem without the stack)
2: modem init mode is low consumption

Parameter1 value	Parameter2 value	Meaning
0	0	Modem response is sent on call establishment (default)
0	1	Modem response is sent when audio path is opened
1	0	Modem normal mode (default)
1	1	Modem powerless mode (Airplane Mode)
1	2	Low Consumption mode

Command example	Possible responses	Note
AT+WBHV=0,0	OK	Set modem response to default mode
AT+WBHV=0,1	OK	Set modem response when audio path is opened
AT+WBHV=1,0	OK	Modem normal (and default) mode
AT+WBHV=1,1	OK	Modem powerless mode
AT+WBHV?	+WBHV: 0,0 +WBHV: 1,0 OK	
AT+WBHV=?	+WBHV: 0,(0-1) +WBHV: 1,(0-2) OK	
AT+WBHV=2,3	+CME ERROR:3	Illegal parameters

GPRS commands

+CGDCONT – Define PDP Context

Description:

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

Four PDP contexts can be defined through WESTERMO software.

A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type), the parameter value ranges for each <PDP_type> are returned on a separate line.

Syntax:

AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp>]]]]]]

Response Syntax:

AT+CGDCONT?

+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>

[+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>

[...]]

AT+CGDCONT=?

+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)

[+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)

[...]]

Parameters:

<cid>

(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. Range of values is 1 to 4.

<PDP_type>

(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

- IP: Internet Protocol
- PPP: Point to Point Protocol

<APN>

(Access Point Name) a string parameter, which is a logical name that is used to select the GGSN or the external packet data network.

If the value is null or omitted, then the subscription value will be requested.

<PDP_address>

A string parameter that identifies the MT in the address space applicable to the PDP.

If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, a dynamic address will be requested. The read form of the command will return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.

<d_comp>

A numeric parameter that controls PDP data compression

0: OFF (default if value is omitted)
1: ON

Other values are reserved.

<h_comp>

A numeric parameter that controls PDP header compression

0: OFF (default if value is omitted)
1: ON

Other values are reserved.

NOTE:

The data compression algorithm provided in SNDCP is V.42bis.

4 CIDs are available to specify 4 PDP contexts but only 1 NSAPI are available for PDP activation. 4 PDP contexts can be specified with only one activated at the same time.

Command example	Possible responses	Note
AT+CGDCONT=1,"IP", "internet"; +CGDCONT=2, "IP","abc.com"	OK	Configure 2 contexts
AT+CGDCONT=?	+CGDCONT: (1-4),“IP”,,, (0-1),(0-1) +CGDCONT: (1-4),”PPP” ,,,0,0 OK	Possible values
AT+CGDCONT?	+CGDCONT: 1, "IP", "internet",,0,0 +CGDCONT: 2, "IP", "abc.com",,0,0 OK	Current values

+CGQREQ – Requested Quality of Service Profile

Description:

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

The 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 command, +CGQREQ= <cid> causes the requested profile for context number <cid> to become undefined.

The command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Syntax:

AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]

Response Syntax:

AT+CGQREQ?

+CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean>

[+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean>

[. . .]]

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)

[+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) [. . .]]

Parameters:

<cid>

Numeric parameter that specifies a particular PDP context definition.
Range of values is 1 to 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 and 3)

2: Normal priority (Service commitments shall be maintained ahead of precedence class 3.)

3: Low priority (Service commitments shall be maintained after precedence classes 1 and 2)

<delay>

Numeric parameter which specifies the delay class

0: Subscribed

1: Delay class 1

2: Delay class 2

3: Delay class 3

4: Delay class 4

	Delay (maximum values)			
	SDU size: 128 bytes		SDU size: 1024 bytes	
Delay Class	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	< 1.5	< 2	< 7
2. (Predictive)	< 5	< 25	< 15	< 75
3. (Predictive)	< 50	< 250	< 75	< 375
4. (Best Effort)	Unspecified			

<reliability>

Numeric parameter which specifies the reliability class

0: Subscribed

1: Up to 1000 (8 kbit/s).

2: Up to 2000 (16 kbit/s).

3: Up to 4000 (32 kbit/s).

4: Up to 8000 (64 kbit/s).

5: Up to 16000 (128 kbit/s).

6: Up to 32000 (256 kbit/s).

7: Up to 64000 (512 kbit/s).

8: Up to 128000 (1024 kbit/s).

9: Up to 256000 (2048 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	Un acknowledged	Acknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that can cope with infrequent data loss.
3	Un acknowledged	Un acknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS.
4	Un acknowledged	Un acknowledged	Protected	Un acknowledged	Real-time traffic, error-sensitive application that can cope with data loss.
5	Un acknowledged	Un acknowledged	Un protected	Un acknowledged	Real-time traffic, error non-sensitive application that can cope with data loss.
NOTE:	For real-time traffic, the QoS profile also requires appropriate settings for delay and throughput.				

<peak>

Numeric parameter which specifies the peak throughput class

0: Subscribed
1: Up to 1000 (8 kbit/s).
2: Up to 2000 (16 kbit/s).
3: Up to 4000 (32 kbit/s).
4: Up to 8000 (64 kbit/s).
5: Up to 16000 (128 kbit/s).
6: Up to 32000 (256 kbit/s).
7: Up to 64000 (512 kbit/s).
8: Up to 128000 (1024 kbit/s).
9: Up to 256000 (2048 kbit/s).

<mean>

Numeric parameter which specifies the mean throughput class

0: Subscribed by the Nwk / default if value is omitted
1: 100 (~0.22 bit/s).
2: 200 (~0.44 bit/s).
3: 500 (~1.11 bit/s).
4: 1000 (~2.2 bit/s).
5: 2000 (~4.4 bit/s).
6: 5000 (~11.1 bit/s).
7: 10000 (~22 bit/s).
8: 20000 (~44 bit/s).
9: 50000 (~111 bit/s).
10: 100000 (~0.22 kbit/s).
11: 200000 (~0.44 kbit/s).
12: 500000 (~1.11 kbit/s).
13: 1000000 (~2.2 kbit/s).
14: 2000000 (~4.4 kbit/s).
15: 5000000 (~11.1 kbit/s).
16: 10000000 (~22 kbit/s).
17: 20000000 (~44 kbit/s).
18: 50000000 (~111 kbit/s).
31: Best effort.

If a value is omitted for a particular class, then it is considered to be unspecified.

Command example	Possible responses	Note
AT+CGQREQ=1,1,4,5,2,14	OK	Configure command
AT+CGQREQ=?	+CGQREG:“IP”,(1-3),(1-4), (1-5),(1-9),(1-31) +CGQREQ:“PPP”,(1-3),(1-4), (1-5),(1-9),(1-31) OK	Possible values
AT+CGQREQ?	+CGQREQ: 1,1,4,5,2,14 OK	Current values

+CGQMIN – Quality of Service Profile (Minimum acceptable)

Description:

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT command, the +CGQMIN command is an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Syntax:

AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]

Response Syntax:

AT+CGQMIN?

+CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean>

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

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)

[+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) [. . .]]

Parameters:

<cid>

A numeric parameter which specifies a particular PDP context.

<precedence>

A numeric parameter which specifies the precedence class.

<delay>

A numeric parameter which specifies the delay class.

<reliability>

A numeric parameter which specifies the reliability class.

<peak>

A numeric parameter which specifies the peak throughput class.

<mean>

A numeric parameter which specifies the mean throughput class.

If a value is omitted for a particular class then this class is not checked.

Command example	Possible responses	Note
AT+CGQMIN=1,1,4,5,2,31	OK	Configure command
AT+CGQMIN=?	+CGQMIN:"IP", (1-3),(1-4),(1-5),(1-9),(1-31) +CGQMIN:"PPP",(1-3),(1-4), (1-5),(1-9),(1-31) OK	Possible values
AT+CGQMIN?	+CGQMIN: 1,1,4,5,2,14 OK	Current values

+CGATT – GPRS attach or detach

Description:

The execution command is used to attach the MT to, or detach the MT from the GPRS service. After the command has completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved because the GPRS is not supported by the MT, 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.

Syntax:

AT+CGATT= [<state>]

Response Syntax:

AT+CGATT?

+CGATT: <state>

AT+CGATT=?

+CGATT: (list of supported <state>s)

Parameters:

<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.

Command example	Possible responses	Note
AT+CGATT=1	OK	Configure command

+CGACT – PDP context activate or deactivate

Description:

The execution command is used to activate or deactivate the specified PDP context(s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged.

If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

If the MT is not GPRS attached when the activation form of the command is executed, the MT first performs a GPRS attach and them attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

If no <cid>s are specified the activation form of the command activates the first possible within the defined contexts.

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

One PDP contexts can be activated through WESTERMO software at the same time.

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

Syntax:

AT+CGACT=[<state> [,<cid>[,<cid>[,. . .]]]]

Response Syntax:

AT+CGACT?
+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [. . .]]
AT+CGACT=?
+CGACT: (list of supported <state>s)

Parameters:

<state>

Indicates the state of PDP context activation

0: deactivated
1: activated

Other values are reserved and will result in an ERROR response to the execution command.

<cid>

A numeric parameter which specifies a particular PDP context.

Before the activation of the context, the MT has to attach itself to the GPRS network if necessary.

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

Command example	Possible responses	Note
AT+CGACT=1,1	OK	Configure command
AT+CGACT?	+CGACT:1,1 OK	Possible values
AT+CGACT=?	+CGACT:(0-1) OK	Current values

+CGDATA – Enter data state

Description:

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

If the <cid> value is not defined to the MT, it will return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.25ter online data state.

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

If no <cid> is given, the MT attempts to activate the context with available information. The other context parameters are set to their default values (No APN, default QOS parameters, dynamic IP address requested).

If the activation is successful, data transfer may proceed.

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

In case of abnormal termination or start up, the V.25ter command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.

This command may be used in both normal and modem compatibility modes.

NOTE:

This command has the same effects as ATD*99#.

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

Syntax:

AT+CGDATA=[<cid>]

Response Syntax:

AT+CGDATA=?

+CGDATA

AT+CGDATA=?

+CGDATA

Parameters:

<cid>

A numeric parameter that specifies a particular PDP context definition.

Command example	Possible responses	Note
AT+CGDATA=1	CONNECT	

+CGCLASS – GPRS mobile station class

Description:

The set command is used to set the MT to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned.

The read command returns the current GPRS mobile class.

The test command is used for requesting information on the supported GPRS mobile classes.

Syntax:

AT+CGCLASS= [<class>]

Response Syntax:

AT+CGCLASS?

+CGCLASS: <class>

AT+CGCLASS=?

+CGCLASS: (list of supported <class>s)

Parameters:

<class>

A string parameter which indicates the GPRS mobile class (in descending order of functionality)

"A": class A (highest)

"B": class B

"CG": class C in GPRS only mode

"CC": class C in circuit switched only mode (lowest)

Other values are reserved and will result in an ERROR response to the set command.

If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a GPRS detach request is sent to the network.

If the MT is GSM attached when the set command is issued with a <class> = CG specified, a GSM detach request is sent to the network.

Class A is not supported by the GDW-xx modems.

NOTE:

During switch-On in CG class, the MS always performs an automatic GPRS attach (the ATTACH-STATUS parameter of +WGPRS is ignored).

But if the MS is not already GPRS attached when switching from B/CC class to CG class then no automatic GPRS attach is performed.

Command example	Possible responses	Note
AT+CGCLASS=”CG”	OK	Enter GPRS class C mode
AT +CGCLASS=”CC”	OK	Enter GSM mode
AT +CGCLASS=”A”	+CME ERROR: 150	Chosen class not supported.
AT+CGCLASS=?	+CGCLASS: ("CG","CC") OK	Possible values
AT+CGCLASS?	+CGCLASS: "CC" OK	Current values
AT+CGCLASS?	+CGCLASS: “B” OK	Example about automatic attachment (see remark above):
AT+CGATT?	+CGATT: 0 OK	Check if registered to GPRS
AT+CGCLASS=”CG”	OK	Set gprs class to CG
AT+CGATT?	+CGATT: 0 OK	Check if registered to GPRS
AT+CGATT=1	OK	Make attach to GPRS nwk
AT+CPOF	OK	
AT+CFUN=1	OK	Make reset of modem
AT+CGCLASS?	+CGCLASS: “CG” OK	Check gprs class
AT+CGATT?	+CGATT: 1 OK	Check if registered to GPRS

+CGSMS – Select service for MO SMS messages

Description:

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

Syntax:

AT+CGSMS= [<service>]

Response Syntax:

AT+CGSMS?

+CGSMS: <service>

AT+CGSMS=?

+CGSMS: (list of currently available <service>s)

Parameters:

<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.

Command example	Possible responses	Note
AT +CGSMS=0	OK	Set to GPRS
AT+CGSMS=?	+CGSMS: (0-3) OK	Possible values

+CGEREP – GPRS event reporting

Description:

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the GPRS MT or the network.

<mode> controls the processing of unsolicited result codes specified within this command.

Read command returns the current mode and buffer settings

Test command returns the modes and buffer settings supported by the MT as compound values.

Syntax:

AT+CGEREP=[<mode>]

Response Syntax:

AT+CGEREP?

+CGEREP: <mode>,<bfr>

AT+CGEREP=?

+CGEREP: (list of supported <mode>s), (list of supported <bfr>s)

Parameters:

<mode>

0: buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.

2: buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE

<bfr>

0: MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 entered. Only this case is supported by the GDW-xx modem.

1: MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 2 is entered. This case is not supported by the GDW-xx modem.

With GDW-xx, a combination of all modes is implemented. When serial link is available, indications are forwarded directly to the TE. If serial link is reserved (e.g. in on-line data mode), if MT result code buffer is full, the oldest ones can be discarded.

Defined events:

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

+CGEV: REJECT <PDP_type>, <PDP_addr>

A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.

+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]

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

+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]

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

+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]

The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV: NW DETACH

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

+CGEV: ME DETACH

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

+CGEV: NW CLASS <class>

The network has forced a change of MS class. The highest available class is reported.

+CGEV: ME CLASS <class>

The mobile equipment has forced a change of MS class. The highest available class is reported.

+CGREG – GPRS network registration status

Description:

The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>] when <n>=2 and there is a change of the network cell.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac> and <ci> are returned only when <n>=2 and MT is registered in the network.

Syntax:

AT+CGREG=[<n>]

Response Syntax:

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

AT+CGREG?

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

AT+CGREG=?

+CGREG: (list of supported <n>s)

Parameters:

<n>

0: disable network registration unsolicited result code

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

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

<stat>

0: not registered, ME is not currently searching a new operator to register to

1: registered, home network

2: not registered, but ME is currently searching a new operator to register to

3: registration denied

4: unknown

5: registered, roaming

<lac>

string type; two byte location area code in hexadecimal format.

<ci>

string type; two byte cell ID in hexadecimal format

Command example	Possible responses	Note
AT+CGREG=0	OK	Disable network registration unsolicited result code, Command valid
AT+CGREG=1	OK	Enable network registration unsolicitedresult code, Command valid
AT+CGREG=2	OK	Enable network registration and location information unsolicited result code, Command valid
AT+CGREG=?	+CREG: (0-2)	0,1,2 <mode> values are supported

'D' – Request GPRS IP service

Description:

This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN.

The V.25ter 'D' (Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocol. The MT return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed 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 PDP type, APN, QoS etc.

If <cid> is not supported or is supported but omitted, the MT attempt to activate the context using the 'Empty PDP type' (GSM 04.08). (No PDP address or APN is sent in this case and only one PDP context subscription record is present in the HLR for this subscriber.)

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

Syntax:

ATD*<GPRS_SC_IP>[***<cid>]#

Response Syntax:

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

AT+CGREG?

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

AT+CGREG=?

+CGREG: (list of supported <n>s)

Parameters:

<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.

Command example	Possible responses	Note
ATD*99***1#	CONNECT	Make a GPRS connect with context 1
ATD*99***2#	ERROR	Make a GPRS connect with context 2

Network requested PDP context activation

In this mode of operation, the MT behaves like an answering modem and accepts the normal V.25ter commands associated with answering a call. If GPRS-specific configuration commands are required, they may be sent to the MT as part of the modem 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 MT attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code RING to the TE, followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

NOTE:

The 'S0=n' (n=0) command does not perform an automatic GPRS detach.

Manual acceptance of a network request for PDP context activation 'A'

The V.25ter 'A' (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING. The MT responds with CONNECT, enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <cid> value specified. It is an error to issue the 'A' command when there is no outstanding network request.

Manual rejection of a network request for PDP context activation 'H'

The V.25ter 'H' or 'H0' (On-hook) command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING. The MT responds with OK. It is an error to issue the 'H' command when there is no outstanding network request.

NOTE:

This is an extension to the usage of the 'H' command that is described in ITU-T V.25ter.

+CGAUTO – Automatic response to a network request for PDP context activation

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 MT as a compound value.

When the +CGAUTO=0 command is received, the MT will not perform a GPRS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request.

When the +CGAUTO=1 command is received, the MT will attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with <cid> values specified.

Syntax:

AT+CGAUTO=[<n>]

Response Syntax:

AT+CGAUTO?

+CGAUTO: <n>

AT+CGAUTO=?

+CGAUTO: (0-3)

Parameters:

<n>

0: turn off automatic response for GPRS only

1: turn on automatic response for GPRS only

2: modem compatibility mode, GPRS only

3: modem compatibility mode, GPRS and circuit switched calls (default)

For <n> = 0: GPRS network requests are manually accepted or rejected by the +CGANS command.

For <n> = 1: GPRS network requests are automatically accepted according to the description above.

For <n> = 2: automatic acceptance of GPRS network requests is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Incoming circuit switched calls can be neither manually nor automatically answered.

For <n> = 3: automatic acceptance of both GPRS network requests and incoming circuit switched calls is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Circuit switched calls are handled as described elsewhere in this specification.

NOTE:

In class C GPRS the modem can't receive simultaneously GPRS and GSM incoming calls.

Command example	Possible responses	Note
AT+CGAUTO=?	+CGAUTO: (0-2) OK	Test command
AT+CGAUTO?	+CGAUTO: 2 OK	Current value
AT+CGAUTO=0	OK	Turn off automatic response for GPRS only

+CGANS – Manual response to a network request for PDP context activation

Description:

The execution command requests the MT to respond to a network request for GPRS PDP context activation which has been signaled to the TE by the RING or +CRING: unsolicited result code. The <response> parameter allows the TE to accept or reject the request.

If <response> is 0, the request is rejected and the MT returns OK to the TE.

If <response> is 1, the following procedure is followed by the MT.

PDP context activation procedures take place prior to or during the PDP startup.

One <cid> may be specified in order to provide the values needed for the context activation request.

During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message.

If a <cid> is given his information must matching with the PDP type and PDP address in the network request as follows:

- The PDP type must match exactly.
- The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

If any of this information is in conflict, the command will fail.

The context is activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition. An APN may or may not be required, depending on the application.

If no <cid> is given, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the MT returns the final result code OK

In the event of an erroneous termination or a failure to startup, the V.25ter command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported. It is also an error to issue the +CGANS command when there is no outstanding network request.

This command may be used in both normal and modem compatibility modes.

Syntax:

+CGANS=[<response>, [<cid>]]

Response Syntax:

AT+CGANS=?

+CGANS: (list of supported <response>s), (list of supported <L2P>s)

Parameters:

<response>

Is a numeric parameter which specifies how the request should be responded to.

0: reject the request

1: accept and request that the PDP context be activated

If <response> is omitted it is assumed to be 0. Other values are reserved and will result in the ERROR response.

<cid>

A numeric parameter which specifies a particular PDP context definition.

Command example	Possible responses	Note
	+CRING: GPRS "IP", "122.41.74.238"	
AT+CGANS=1	CONNECT	
AT+CGANS=?	+CGANS: (0-1) OK	

+CGPADDR – Show PDP address

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

Syntax:

+CGPADDR=[<cid> [,<cid> [,. . .]]]

Response Syntax:

+CGPADDR: <cid>,<PDP_addr>

[+CGPADDR: <cid>,<PDP_addr>

[...]]

AT+CGPADDR=?

+CGPADDR: (list of defined <cid>s)

Parameters:

<cid>

A numeric parameter which specifies a particular PDP context definition. If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_address>

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

Command example	Possible responses	Note
AT+CGPADDR=1	+CGPADDR=1,"107.210.5.4" OK	
AT+CGPADDR=?	+CGAPDDR: (1,2,4) OK	Possible values
AT+CGPADDR	+CGPADDR: 1, +CGPADDR: 2,"10.3.73.151" +CGPADDR: 4,	

+CRC – Cellular result codes

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: FAX	for fax calls
+CRING: GPRS	GPRS network request for PDP context activation

If the MT is unable to announce to the TE the network's request (for example it is in V.25ter online data state) the MT rejects the request. No corresponding unsolicited result code is issued when the MT returns to a command state.

Syntax:

See +CRC command descibed in the data commands section

Parameters:

No parameter.

+CR – Service reporting control

Description:

This command enables a more detailed service reporting, in case of data incoming or outgoing call. Before sending the CONNECT response to the application, the modem will precise the type of data connection that have been established.

These report types are:

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

Syntax:

AT+CR=<mode>

Parameters:

<mode>

0: disable extended reports

1: enable extended reports

Command example	Possible responses	Note
AT+CR=0	OK	Extended reports disabled
AT+CR=1	OK	Extended reports enabled

+CEER – Extended error report

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.

Syntax:

AT+CEER

The cause information element from GSM 04.08 is given below in codes and values section for specific GPRS failure causes (values 224 to 238).

The "NO CARRIER" indicates that the AT+CEER information is available for a failure diagnostic.

Parameters:

No parameters.

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

+WGPRS – GPRS parameters customization

Description:

This command modifies some WESTERMO GPRS parameters:

- the ATTACH-STATUS (the ME does or not perform automatically a GPRS attachment after initialization),
- the PDP-INIT-STATUS (activates automatically or not 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 permits to

- set automatically "ACTIVABLE" some defined PDP contexts after initialization,
- set some parameters for 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)
- PPP Filtering is a specific parameter for validation team (**Note**: this parameter is not save and is set to OFF after reboot).

NOTE:

The modem must be rebooted to activate the new setup except for <mode> 3, 5 and 6 (please refer to the Parameters paragraph).

Syntax:

AT+WGPRS=<mode>,<parameter>[,<cid>][,<class>]

Response Syntax:

AT+WGPRS=?

+WGPRS: <mode>, <parameter1>[,<cid>]

[+WGPRS: <mode>, <parameter>[,<cid>]

[...]]

AT+WGPRS?

+WGPRS:<mode>(list of supported <parameter>) [,(list of supported <cid>)]

[+WGPRS:<mode>(list of supported <parameter>) [,(list of supported <cid>)] [. . .]]

Parameters:

<mode>

A numeric parameter which specifies a WESTERMO GPRS parameter.

0: ATTACH-STATUS (the ME don't make automatically 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

NOTE:

- If <mode>=0, 1, 3, 4, 5 or 6, <cid> and <class> values will be ignored.
- If <mode>=0, 1, 2, 3, 5 or 6, <class> value will be ignored.
- If <mode>=4, <parameter> and <cid> values will be ignored.the modem must be restarted to take the modification into account.
- PPP Filtering is a test-purpose functionality. It avoids sending on the radio link some OS-specific frames, 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 which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. Range of values is 0 to 4.

<class>

GPRS multislot class number. It may be lower than the maximum possible class. Possible values are 2, 8, 10, 12. Refer to doc ref [6] for more information about GPRS multislot classes.

Multislot class	Maximum number of slots			Minimum number of slots				Type of MS
	Rx	Tx	Sum	Tta	Ttb	Tra	Trb	
2	2	1	3	3	2	3	1	1
8	4	1	5	3	1	2	1	1
10	4	2	5	3	1	2	1	1
12	4	4	5	2	1	2	1	1

NB: Type 1 MS are not required to transmit and receive at the same time.

NOTE:

When the modem is set in "CG" class, the ME always make automatically a GPRS attachment after init, so AT+WGPRS? always give +WGPRS: 0,0 for the parameter 0.

Command example	Possible responses	Note
AT+WGPRS=2,1,3	OK	set ACTIVABLE to ON on PDP context 3
AT+WGPRS=4,,,8	OK	choose GPRS multislot class 8
AT+WGPRS=?	+WGPRS: (0-6),(0-1),(0-4), (2,8,10,12) OK	Request ranges of values
AT+WGPRS?	+WGPRS: 0,0 +WGPRS: 1,0 +WGPRS: 2,1,1 +WGPRS: 2,0,2 +WGPRS: 2,0,3 +WGPRS: 2,0,4 +WGPRS: 3,1 +WGPRS:4,8 +WGPRS:5,1 +WGPRS:6,1 OK	

I/O commands – only in GDW-12

*WIOD – Generic I/O delete entry

Description:

This command delete one or more I/O entries in the list.

Syntax:

AT*WIOD=<index>[,< stop_index>]

AT*WIOD=?

Result syntax:

*WIOD:<index>[, <stop_index>]

Parameters:

<index>

Index of first entry to delete

<start,stop>

Last entry to delete

Command example	Possible responses	Note
AT*WIOD=2	OK	Delete entry 2
AT*WIOD=3,7	OK	Delete entries 3,4,5,6,7
AT*WIOD=?	*WIOD: (1-10)[,(1-10)] OK	Request the format string

*WIOE – Generic I/O enable

Description:

This command enables / disables remote I/O access.

Syntax:

AT*WIOE=<val>

AT*WIOE=?

AT*WIOE?

Parameters:

<val>

Value of the enable parameter [0-1].

Enable = 1 and Disable =0

Command example	Possible responses	Note
AT*WIOE=1	OK	Enable remote I/O
AT*WIOE=0	OK	Disable remote I/O
AT*WIOE=?	*WIOE: (0-1) OK	Request the format string
AT*WIOE?	*WIOE=1 OK Request the format string AT*WIOE=? *WIOE: (0-1) OK	Remote I/O enabled

*WIOL – Generic I/O list

Description:

This command is used to program the list of I/O entries with parameters and data.

The list can contain up to 10 entries

Syntax:

Set up a service entry:

AT*WIOL= <entry>,<service>,<flag>,<timeout>,<priority>,<data1>,<data2>,<data3>, <data4>,<data5>,<data6>

NOTE:

List all table entries. Listing will pause ever 3.th entry and wait for any key hit to continue. ESC will terminate.

Parameters:

<entry>

IO entry number, up to eight entries can be defined.

<service>

IO entry service, value as described in table below:

0: NONE, No service defined for this entry

1: DIAL, Makes a connection to the number defined in <data1>

2: SMS, data fields defined as described below:

<data1> Destination number of the SMS

<data2> SMS-message.

<data3> SMS service provider number

<data4> SMS protocol type (0=NONE,1=UCP,2=TAP)

<data5> Password if required by provider.

3: TEXT, Make a connection to number defined in <data1> and transfer text defined in <data2>.

4: EMAIL, Reserved for future use, service not implemented

5: OUT, Make a connection to the number defined in <data1> and set/pulse the remote output according to pattern defined in string defined in <data2>. The connection is terminated after the pattern is transferred.

6: CMD, AT command specified by <data1> is executed when the entry is trigged

7: TRANS, Makes a connection to number defined by <data1>, I/O is transferred transparently between the two units. The transparent mode must be ended by a timeout.

<flag>

Defines if the establishment of service shall be retried, the time between retries is controlled by register S7.

0: NO, No retry, tries once to perform requested action

1: RETRY, Retry infinitely to establish service according to current table entry.

2: RETRY_3, Do 1 try and max 3 retries.

3: NEXT_OK, If current service ends with OK the service specified by next table entry will be trigged. If fail to perform/establish the current entry service the unit will return to idle.

4: NEXT_ERR, The unit will execute service specified by next table entry if fail to perform/establish current service.

NOTE:

If service according to current table entry terminates normally, the unit will return to idle and wait for any new event trigger.

<timeout>

Timeout is used in Dial and Transparent I/O. The timeout is designed as an inactivity timer and will be retrigged for each Data / I/O transfer. The timeout is the only normal way to terminate Dial and Transparent I/O.

0: The service will not be terminated

1 – 255: The timeout is specified in units of 10s. Valid values 1 – 255 *10 s (10s – 2550s)

NOTE:

- Please see Table 1 for reference of state after termination by timeout.
- Setting a timeout for any other service than transparent I/O will not cause any failure but will not have any function.

<priority>

Priority of the service specified.

0: An existing connection will not be terminated Retries will be made according to setting of <flag>, time between retries is set by register S7.

1: The current connection will be terminated before the connection specified by service is established.

<data1>

The interpretation of this field depends on the service specified for the entry. The field accepts 0 – 20 characters. The table below describes the different functions of <data1> field in each different service.

DIAL: Number to connect to

SMS: Phone number of SMS receiver

TEXT: Phone number of TEXT receiver, if left empty the TEXT is sent out on the local DTE connection.

EMAIL: Reserved.

OUT: Phone number of the modem where the output shall be set. If <data1>, is empty the transfer will be to the local digital output.

CMD: AT command string to be executed when the entry is trigged, can be used to modify the trigger condition

TRANS: Phone number of the modem to which the transparent I/O should occur. For dependencies of other parameters and line type, Please See Table 1

- <data1>=number
  Makes a connection to the number defined and start Transparent I/O transfer between the two units.
- <data1>=empty
  Transparent I/O transfer will use an existing data connection.

<data2>

Interpretation of field <data2> is also service dependent the size is 0 – 160 characters.

DIAL: Not used

SMS: The SMS message

TEXT: Text message

EMAIL: E-mail message

OUT: A sequence of "101.." to be transferred to the addressed output

CMD: Not used

TRANS: Not used

<data3>

Field <data3> is only used for SMS and EMAIL service.

The content of <data3> in each service is described below.

SMS: SMS provider number.

EMAIL: Reserved for ISP number

<data4>

Field <data4> is only used for SMS and EMAIL service.

The content of <data4> in each service is described below.

SMS: SMS protocol. 0 = No protocol, 1= UDP, 2 = TAP

EMAIL: Reserved for email protocol

<data5>

Field <data5> is only used for SMS and EMAIL service.

The content of <data5> in each service is described below.

SMS: Password for access to SMS provider

EMAIL: Reserved for password to mail server

<data6>

Field <data6> is only used for EMAIL service. The content of <data6> is described below.

EMAIL: Reserved for username to mail server

Connected	Data 1	prio	Line Type	
No	Empty	No	CS	Error, try to establish service failed
No	Empty	Yes	CS	Error
No	Number	No	CS	Normal Transparent I/O over Circuit switched line
No	Number	Yes	CS	Normal Transparent I/O over Circuit switched line
Yes	Empty	No	CS	Use current connection for I/O transfer. The Empty data 1 will override priority. See **NOTE**
Yes	Empty	Yes	CS	Use current connection for I/O transfer See **NOTE**
Yes	Number	No	CS	Due to that line is busy and no priority set the modem will retry connection according to <flag> .
Yes	Number	Yes	CS	Disconnect and dial Number

Table 1 Dial and Transparent I/O connection types

CS = Circuit switched PSTN, ISDN or GSM

NOTE:

The existing data connection will be paused during transparent I/O transfer. The modem will use the flow control specified by flow control command. If no flow control set DTE data will be discarded during the Transparent I/O transfer. When the transparent I/O transfer is terminated by timeout the connection will revert to data-mode and activate CTS / sending XON.

Command example	Possible responses	Note
AT*WIOL =1,2,2,0,1, 0164251,Hello Westermo, 00491712521002	OK	Define entry #1 for SMS service with 3 retries, priority, receiver of SMS 016480251, message “Hello Westermo”, provider 00491712521002
AT*WIOL =4,7,1,40, 1,016480250	OK	Define entry #4 for Transparent I/O service with retry for ever, priority, timeout 400s, remote modem number 016480250
AT*WIOL?	1_Service= SMS 1_Flag= RETRY_3 1_Timeout=0 1_Priority=YES 1_Data1=016480251 1_Data2= Hello Westermo 1_Data3=00491712521002 1_Data4= 1_Data5= 1_Data6= 2_Service= DIAL 2_Flag=RETRY 2_Timeout=0 2_Priority=NO 2_Data1=12345 2_Data2= 2_Data3= 2_Data4= 2_Data5= 2_Data6= . . 10_Data5= 10_Data6= OK	

Command example	Possible responses	Note
AT*WIOL=4?	4_Service=TRANS 4_Flag=RETRY 4_Timeout=040 4_Priority=YES 4_Data1=016428250 4_Data2= 4_Data3= 4_Data4= 4_Data5= 4_Data6=	List the entry table: List entry 4

*WIOT – Generic I/O test

Description:

This command executes the specified entry as if it was trigged by the normal trigger condition.

Syntax:

AT*WIOT =<entry_num>[,<IO_state>]

Parameters:

<entry_num>

IO entry index number (0 – 10) 1 – 10 selects the entry at the corresponding index in the table. Selecting entry_num =0 selects the local output, the state of the output is selected with parameter I/O_state

<IO_state >

The state to set the local output (0 or 1) when entry_num is set to 0.

Command example	Possible responses	Note
AT*WIOT =2	OK	Trigger and execute entry 2 in the table
AT*WIOT =?	*WIOT: (0-10)[,(1-1)] OK	

*WIOP – Generic I/O parameters

Description:

This command set the I/O parameters.

Syntax:

AT*WIOP=<tmin>,<tmax>,<type>,<trig>,<norm>

Parameters:

<tmin>

Min trig pulse time in 10 ms increments [1-255].

This parameter sets the minimum time the pulse must be active. A pulse shorter than this time will be skipped.

<tmax>

Max trig pulse time in 10 ms increments [1-255]

Sets the maximum active with of a pulse, if pulse is longer the pulse will be skipped.

The number of pulses will be calculated when the time between pulses is longer than 3 times tmin.

<type>

Trig source and type according to the table below:

0: NO, Trigger not used
1: LEVEL, Trigger source is the Digital input Level
2: PULSE, Pulsed trigger used
3: DCD, Trigger internally coupled to reflect the DCD signal
4: DTR, Trigger internally coupled to reflect the DTR signal

<trig>

Trigger level.

0: NO, Trigger not used
1: HIGH, Defines that a High level triggers the service
2: LOW, Defines that a Low level triggers the service
3: POS, A positive edge triggers the service.
4: NEG, A negative edge triggers the service.

<norm>

The source controlling the output.

0: NO, Output not used
1: IO operation, Controlled by remote I/O Transparent or Out
2: Reserved
3: DCD, Output will be controlled by DCD. An active DCD will activate the output.
4: DTR, Output will be controlled by DTR. An active DTR will activate the output.

Command example	Possible responses	Note
AT*WIOP=50,100,1,1,3	OK	Set input min pulse width to 500 ms max pulse width to 1s, trigged on high level and output to follow DCD
AT*WIOP=,,2,,	OK	Change input type to be pulse trigged
AT*WIOP?	*WIOP : TMIN=50, TMAX= 100, TYPE=2, TRIG=1, NORM=3 OK	Current value

*WRAP – Remote access password

Description:

This command set the remote access password.

Syntax:

AT*WRAP =<password>

<password>

Remote access password (6-20 characters) setting password to – will delete the previous password.

Command example	Possible responses	Note
AT*WRAP=QwErTy	OK	Set password to "QwErTy"
AT*WRAP=?	*WRAP : (6-20 char) OK	Test commands

Callback security commands – only in GDW-12

*WCB – Callback security

Description:

The callback functionality makes the established link more secure. After an incoming call the adapter will make a callback to either a preconfigured number or to the incoming number. The callback can be protected by a password. The modem can also be configured for a secure access without callback.

If the password is enabled, the calling part will be prompted for the password directly after connection. When the password is entered correctly, the adapter will disconnect the current link and make a callback after a preconfigured number of seconds (configurator command: capa*wcbtime [default 3]).

If the modem is configured as ”secure access”, it will allow data only after the password is correctly entered.

After 3 retries of entering wrong password or after 60 seconds, the link will be disconnected and the callback/secure access aborted.

The number to callback must be entered in the wcbtab number table (*wcbtab1, *wcbtab2 or *wcbtab3).

The passwords is stored in: *wcbpwd1, *wcbpwd2 or *wcbpwd3.

When making a callback to a number stored in *wcbtab, the password in *wcbpwd1 is connected to the number in *wcbtab1 (and *wcbpwd2 to *wcbtab2 and *wcbpwd3 to *wcbtab3)

Syntax:

AT*WCB=<callback control>

Parameters:

<callback control>

0: callback disabled (default)

1: callback enabled, No password needed, callback number only in position1 in *wcbtab (catab1)

2: callback enabled, No password needed, callback to incoming number

3: access security enabled, Password in one or more positions in cbpwdx (x= 1,2 or 3)

4: callback enabled, Password in one or more positions in *wcbpwdx (x= 1,2 or 3), callback to number in *WCBTIMEn, (*wcbpwd1 corresponds to *wcbtab1. . .)

5: callback enabled, Password in one or more positions in *wcbpwdx (x= 1,2 or 3), callback to incoming number

6: callback enabled, Password in one or more positions in *wcbpwdx (x= 1,2 or 3), callback to number that is entered after password check is OK.

See also the following commands: *wcbtab, *wcbpwd, capawcbtime.

Command example	Possible responses	Note
AT*WCB=2	OK	Callback enabled
AT*WCB?	*WCB: 2 OK	Check current value

*WCBPWD – callback/secure access password

Description:

This command is used to store the password used in the callback and the secure access functionality.

Three different passwords can be stored.

Syntax:

AT*WCBPWD1=<pwd>

AT*WCBPWD2=<pwd>

AT*WCBPWD3=<pwd>

Parameters:

<pwd>

The password may contain any writable character. The maximum number of characters is 20.

See also the following commands: *wcbtab, *wcb, capawcbtime

Command example	Possible responses	Note
AT*WCBPWD1=qwerty	OK	Set password no 1
AT*WCBPWD2=asdfgh	OK	Set password no 2
AT*WCBPWD3=zxcvbnm	OK	Set password no 3
AT*WCBPWD1?	*WCBPWD1: qwerty	Current value
AT*WCBPWD3=-	OK	Delete the password

*WCBTABx – Secure callback table

Description:

This command is used to store the numbers used in the callback and the secure access functionality.

Three different numbers can be stored.

Syntax:

AT*WCBTAB1=<number>

AT*WCBTAB2=<number>

AT*WCBTAB3=<number>

Parameters:

<number>

A callback number or '-' to clear the number

NOTE:

Maximum number of entries = 3

Maximum length of number = 20 digits.

Command example	Possible responses	Note
AT*WCBTAB1=123456	OK	set entry number 1 to number 123456.
AT*WCBTAB1=-	OK	clear entry number 1
AT*WCBTAB2=98765432	OK	set entry number 2 to number 98765432.
AT*WCBTAB2?	*WCBTAB2: 98765432	show entry number 2
AT*WCBTAB?	*WCBTAB1: *WCBTAB2: 98765432 *WCBTAB3:	show all entries

See also the following commands: *wcbpwd, *wcb, capawcbtime

*WCBTIME – Secure call-back delay

Description:

This command controls the delay before a call-back is made at the Call-back command. The delay is necessary to allow the calling modem to disconnect

Syntax:

AT* WCBTIME =<timel>

AT* WCBTIME =?

AT* WCBTIME?

Parameters:

<time>

The number of seconds the call-back is delayed [0-255].

Command example	Possible responses	Note
AT*WCBTIME =10	OK	Delay the call-back 10s
AT*WCBTIME =0	OK	No delay
AT*WCBTIME =?	WCBTIME: (0-255) OK	Request the format string
AT*WCBTIME?	* WCBTIME =15	The current delay setting

TCP SOCKET AUTOCONNECT Commands

*WTCPCONNECT – TCP socket link control

Description:

This command is used to enable or disable the TCP socket link control. When enabled, the modem will automatically after power on, set up connections to a packet switched network and start working either as a TCP server or a client (depending on configuration).

Syntax:

AT*WTCPCONNECT=<mode>

Parameters:

<mode>

1= enabled
0=disabled

Command example	Possible responses	Note
AT*WTCPCONNECT=1	OK	Enable TCP link control
AT*WTCPCONNECT?	*WTCPCONNECT: 1 OK	Show value
AT*WTCPCONNECT=?	*WTCPCONNECT: (0,1) OK	Show range

*WTCPMODE – TCP client server select

Description:

This command is used to select if the modem shall act as a client or server in a TCP socket link.

Syntax:

AT*WTCPMODE=<mode>

Parameters:

<mode>

1= server
0=client

Command example	Possible responses	Note
AT*WTCPMODE =1	OK	Set modem to work in server mode
AT*WTCPMODE?	*WTCPMODE: 1 OK	Show value
AT*WTCPMODE =?	WTCPMODE: (0,1) OK	Show range

*WGPRSAPN – GPRS APN for TCP Socket autoconnect

Description:

Defines the Access Point Name needed to set up a GPRS connection. The APN is a parameter from the network provider that defines the GPRS access type, (eg. fixed or dynamic IP address allocation, private or public IP address)

Syntax:

AT*WGPRSAPN=<"apn_string">

Parameters:

<apn_string>

An alphanumeric ASCII text string specifying the APN for the GPRS service. String can be max 30 characters long.

Command example	Possible responses	Note
AT*WGPRSAPN=" static.vodafone.net"	OK	Set command with APN string.
AT*WGPRSAPN?	*WGPRSAPN: "static.vodafone.net"	Current value
AT*WGPRSAPN=?	*WGPRSAPN: ("APN")	Test command

*WGPRSUN – GPRS Username for TCP Socket autoconnect

Description:

Defines the username needed to set up a GPRS connection. The username is a parameter from the network provider that is needed together with the APN and the password for a successful GPRS connection. Depending on GPRS access type, the username and password may not be needed, check with the GPRS service provider for more information.

Syntax:

AT*WGPRSUN =<"username">

Parameters:

<username>

An alphanumeric ASCII text string specifying the username for the GPRS service. String can be up to 30 characters long.

Command example	Possible responses	Note
AT*WGPRSUN="USER_1"	OK	Set command with username
AT*WGPRSUN?	*WGPRSUN: "USER_1"	Current value
AT*WGPRSUN=?	*WGPRSUN: ("username")	Test command

*WGPRSPW – GPRS Password for TCP Socket autoconnect

Description:

Defines the password needed to set up a GPRS connection. The password is a parameter from the network provider that is needed together with the APN and the username for a successful GPRS connection. Depending on GPRS access type, the username and password may not be needed, check with the GPRS service provider for more information.

Syntax:

AT*WGPRSPW =<"password">

Parameters:

<password>

An alphanumeric ASCII text string specifying the password for the GPRS service. String can be up to 30 characters long

Command example	Possible responses	Note
AT*WGPRSPW="USER_1"	OK	Set command with password.
AT*WGPRSPW?	*WGPRSUN: "USER_1"	Current value
AT*WGPRSPW=?	*WGPRSUN: ("password")	Test command

*WTCPSERV –TCP Socket IP address for TCP Socket autoconnect

Description:

If the modem is configured as server then this parameter is used as an address mask to select valid incoming (IP subaddresses, 255.255.255.255 allows all incoming clients)

If the modem is configured as a client then this parameter must be set to the IP address of the remote server that the modem wants to set up a link to.

Syntax:

AT*WTCPSERV=<IP_address>

Parameters:

<IP_address>

32 bit IP-address number in dotted decimal notation (i.e. xxx.xxx.xxx.xxx).

Command example	Possible responses	Note
AT*WTCPSERV= ”192.168.10.121”	OK	Set command with IP address of server.
AT*WTCPSERV?	*WTCPSERV: ”192.168.10.121”	Current value
AT*WTCPSERV =?	*WTCPSERV: (“server or client IP”)	Test command

*WTCPPORT –TCP Socket port for TCP Socket autoconnect

Description:

This command configures the TCP port used in the TCP session.

To exchange data over TCP, the TCP/IP stack must know the port of the remote peer used for the TCP session.

Syntax:

AT*WTCPPORT =<PORT_number>

Parameters:

<PORT_number>

A port number used in the current TCP session. Must be the same for both remote and local modem.

Value is in decimal form and must be between 1 and 65535.

Command example	Possible responses	Note
AT*WTCPPORT = 9000	OK	Set command with port number
AT*WTCPPORT?	*WTCPPORT: 9000	Current value
AT*WTCPPORT =?	*WTCPPORT: (1-65535)	Test command

*WTCPTXDELAY – TCP Socket port for TCP Socket autoconnect

Description:

This command configures the delay (expressed in milliseconds) before the socket transmits the characters to the remote modem. This parameter is needed to keep the TCP communication effective with respect to packet overhead data.

Syntax:

AT*WTCPTXDELAY =<Delay>

Parameters:

<Delay>

The delay can be configured in 20 ms steps. Value can be from 0 to 32760. Default value is 100 ms.

Command example	Possible responses	Note
AT*WTCPTXDELAY =200	OK	Set command with delay value 200 milliseconds
AT*WTCPTXDELAY?	*WTCPTXDELAY: 200	Current value
AT*WTCPTXDELAY =?	*WTCPTXDELAY: (0-32760)	Test command

AT*WTCPI – TCP connect status information

Description:

This command controls if detailed status information should be reported when using the TCP connect functionality. Reported event are:

- Registration status
- GPRS session status
- TCP session status
- IP-address

Syntax:

AT*WTCPI= <mode>

Parameters:

<mode>

1: Displays some status information during a TCP connection
0: No information is displayed during TCP connection

Command example	Possible responses	Note
AT*WTCPI=1	OK	Enable status information
AT*WTCPI?	*WTCPI: 1 OK	Show current value
AT*WTCPI=?	*WTCPI: (0,1) OK	Show range

AT*WTCPV– View Tcp Connect settings

Description:

This command lists the current values of the gprs and tcp parameters used in the TCP connect function.

Syntax:

AT*WTCPV

Command example	Possible responses		Note
AT*WTCPV			Display current values on the TCP commands
	*WGPRSAPN:	"wyless.uk"	
	*WGPRSUN:	"USER_1"	
	*WGPRSPW:	"PASSWORD_1"	
	*WTCPSERV:	"255.255.255.255"	
	*WTCPCLIENTIP:	""	
	*WTCPPORT:	9000	
	*WTCPTXDELAY:	100	
	*WTCPMODE:	0	
	*WTCPPINGSYNCMODE:	0,5,20	
	*WTCPCONNECT:	0	
	OK		

AT*WTCPPINGSYNC – Configures the synchronisation mechanism used in TCP Autoconnect

Description:

This command controls how the ME will synchronize itself with the remote ME when set up to run in TCP Autoconnect mode (*WTCPCONNECT=1). Both the client and the server will use echo request (PING) to see if the GPRS network service is present and if the remote ME is attached and ready to set up the TCP session.

The ME will PING the remote unit after the GPRS PDP context has been activated and will stop PINGing after a successful reply is received which is a criteria for the TCP Autoconnect application to continue to set up the TCP server or client.

After a PING request, the ME will wait <delay> number of seconds before considering the request as failed. A new PING will be sent out directly after the previous PING timed out.

In order to continuously monitor the communication link and to provide a link recover function, an internal routine starts to measure elapsed time when no data is transferred on the link. When the configured time (see the third parameter) has elapsed, the unit will fall back to the PING synchronisation state and continue as described above.

Since pinging the remote ME (sending data) over the GPRS network is charged per byte,

it is preferable to configure the units in the TCP Autoconnect mode to send synchronisation data (ping) in a controlled way and not too often.

The PING synchronisation can also be disabled, in which case the units will not know if the remote party is online or not before they continue with the higher layer protocol set up.

Syntax:

AT*WTCPPINGSYNC=<mode>, <delay>, <idle>

Parameters:

<mode>

0: Disabled (default)

1: Enable ping synchronisation, the ping is sent out periodically each <delay> timeout until a successful reply is received. (default: 0)

<delay>

1-255:

value in seconds, configures how long the ME will wait on a echo reply after an echo request (ping) has been sent to remote ME. (default: 5 seconds)

<idle>

1-32767:

A time parameter that is used internally in the no-data-idle routine. The routine monitors the active TCP link and

makes a PING re-synchronisation when no data has been detected on the link after <idle> seconds. (default: 20)

Command example	Possible responses	Note
AT*WTCPPINGSYNC=1,5,20	OK	Enable PING synchronisation. Configure delay to 5 seconds and idle factor to 20
AT*WTCPPINGSYNC?	*WTCPPINGSYNC: 1,5,20 OK	Show current value
AT*WTCPPINGSYNC=?	*WTCPPINGSYNC: (0,1),(1-255),(1-32767) OK	

AT*WTCPCLIENTIP – Configures the the IP address if the client

Description:

This command specifies the IP address of the remote client when the unit is configured as a server and used in the TCP Autoconnect mode with the PING synchronisation enabled (*WTCPPINGSYNC=1).

The server has to be configured with the IP address of the client since the servers *WTCPSERV is set to work as an address-mask.

Syntax:

AT*WTCPCLIENTIP=<clientIP>

Parameters:

<clientIP>

Client IP address.

Command example	Possible responses	Note
AT*WTCPCLIENTIP= ”192.168.62.52”	OK	Configures the IP address of the client
AT*WTCPCLIENTIP?	*WTCPCLIENTIP: ”192.168.62.52” OK	Current value
AT*WTCPCLIENTIP=?	*WTCPCLIENTIP: (”remote client IP”) OK	Valid parameters

AT*WGPRSCONNECT – Initiates a GPRS PDP context

Description:

Initiates a GPRS PDP context activation according to the gprs parameters (see *WTCPV for list of parameters).

The AT*WTCPI=1 command gives more detailed information about the commands execution status.

Syntax:

AT*WGPRSCONNECT

Command example	Possible responses	Note
AT+CGREG?	+CGREG: 0,1	Indicates that unit is attached to GPRS network.
AT*WGPRSCONNECT	OK	Activate GPRS

AT*WGPRSDISCONNECT – Disconnects active GPRS PDP context

Description:

This command disconnects an active GRPS PDP context previously activated with AT*WGPRSCONNECT.

The AT*WTCPI=1 command gives more detailed information about the commands execution status.

Syntax:

AT*WGPRSDISCONNECT

Command example	Possible responses	Note
AT*WGPRSDISCONNECT	OK	Disables the GPRS context

AT*WTCPSTART – Activates a TCP session

Description:

Activates a TCP session according to the TCP parameters listed by the *WTCPV command. The unit can act as a TCP server or a client according to the TCP parameters.
A precondition for this command is that a successful *WGPRSCONNECT has been executed.
The TCP session is a service that requires the underlaying GPRS PDP context to be active.
To interrupt an active TCP session and to enter command mode again, the user have to send the escape sequence '+++' to the modem.

The AT*WTCPI=1 command gives more detailed information about the commands execution status.

Syntax:

AT*WTCPSTART

Command example	Possible responses	Note
AT*WTCPSTART	OK	Start a TCP session

AT*WTCPSTOP – Deactivates a TCP session

Description:

This command deactivates a TCP session previously activated with AT*WTCPSTART. After closing the an TCP session, the modem will still have the GPRS active.

The AT*WTCPI=1 command gives more detailed information about the commands execution status.

Syntax:

AT*WTCPSTOP

Command example	Possible responses	Note
+++	OK	Enter command mode with the escape sequence.
AT*WTCPSTOP	OK	Close the TCP session.

AT*WIPSTATUS – GPRS & TCP connect status information

Description:

This command reports IP stack status and current local IP.

Reported event for IP stack are:

- NO_SERVICE
- IDLE
- CONNECTED
- DIALING

Syntax:

AT*WIPSTATUS

Parameters:

–

Command example	Possible responses	Note
AT*WIPSTATUS	IP stack state: "IDLE" Current local IP: none	Check status: PDP context is not active
AT*WGPRSCONNECT	OK	Activate PDP context
AT*WIPSTATUS	IP stack state: "CONNECTED" Current local IP: 192.168.25.46	Check status: PDP context is now active and unit has received an IP-address

AT*WCMEE – Error result codes CME: on *Wxxx and standard commands

Description:

This command controls if extended result codes CME: xxx should be send out if extended result codes are wanted on the *Wxxx and standard commands.

Example of some unsoliced result codes that are controlled by this command:

+WIND, +CREG, +CGREG, +CGEREP and *Wxxx result codes

Syntax:

AT*WCMEE=<mode>

Parameters:

<mode>

0: Disable (default)

1: Enable

Command example	Possible responses	Note
AT*WCMEE=1	OK	Enable extended error codes
AT*WCMEE?	*WCMEE: 1 OK	Show current value

*WPINGCONFIG – Configurates the parameters for the ping service

Syntax:

AT*WPINGCONFIG =<delay>, <ping>, <"IP_adress">

Parameters:

<delay>

Delaytime between each ping .Value can be from 1 to 100. Default value is 3. Increased in step of seconds.

<ping>

Number of pings. Value can be from 1 to 100. Default value is 4.

<"IP_adress">

Destination IP adress

Command example	Possible responses	Note
AT*WPINGCONFIG= 50,5,"192.36.125.18"	OK	Configurated for 5 ping package, 5s between each ping to IP adress 192.36.125.18
AT* WPINGCONFIG?	*WPINGCONFIG: 5, 50, "192.36.125.18" OK	Current value
AT* WPINGCONFIG =?	*WPINGCONFIG: (1-100), (1-100), ("IP addr") OK	Test command

AT*WPING – Request a ping to the IP address configured by *WPINGCONFIG

Description:

This command sends out echo requests (ping) to the IP_address configured with *WPINGCONFIG. Thenumber of pings sent out and the delay parameter are also configured with the *WPINGCONFIG command.

The unit must be connected to the GPRS network before the *WPING command can be used.

Syntax:

AT*WPING

Command example	Possible responses	Note
AT+CGREG?	+CGREG: 0,1	Indicates that unit is attached to GPRS network.
AT*WGPRSCONNECT	OK	Activate GPRS
AT*WPINGCONFIG=3,4, "192.36.125.18"	OK	Configure the ping parameters
AT*WPING	PING sent PING received PING sent PING received PING sent PING received PING sent PING received Results: 4 PINGs transmitted to 192.36.125.18 4 ECHOs received Send PING request.	

AT#D – Dial to IP address

Description:

This command configures a GPRS/TCP link according to the "AT*WGPRSxxx" and "AT*WTCPxxx" parameters.

The unit will be configured as an TCP client and try to establish a TCP link to the remote entity IP address and port number as described in the command string.

Disconnection can be done with the escape sequence <+++> and the hang-up command "ATH".

Syntax:

AT#D<IP_address> : <port>

Parameters:

<IP_address>

Destination IP address

<port>

Port number of the remote entity

Command example	Possible responses	Note
AT#D192.168.0.5:9000	CONNECT	A TCP link is set up to remote entity
+++	OK	Escape sequence
ATH	NO CARRIER	Disconnection

SIM TOOLKIT

NOTE:

SIM Toolkit can be activated and used with two different sets of commands.

- RIL (Radio Interface Laser): +CRSM (§), +CSIM(§), +STRIL(§)
- WESTERMO commands, described in the following paragraphs.

These two behaviors are exclusive.

Overview of SIM Application ToolKit

Summary:

SIM ToolKit, also known as "SIM Application ToolKit" introduces functionalities, which open the way to a broad range of value added services.

The principle is to allow service providers to develop new applications (e.g. for banking, travel, ticket booking, etc.) for subscribers and to download them into the SIM.

This solution allows new services to be accessible to the user by adding new SIM-based applications without modifying the handset.

Functionality:

SIM Toolkit refers to the functionalities described in the GSM Technical specification 11.14.

It introduces twenty five commands for the SIM. Three classes of increasing ToolKit functionalities have been defined, with class 1 offering a subset of commands and class 3 offering the full range of commands.

The SIM Application Toolkit 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 is supported by the customer application.

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 (SMS, phonebook) allows data or programs (Java applets) received by SMS or by Cell Broadcast to be transferred directly to the SIM Application.

This feature does not need any AT command. It is transparent to the customer application.

Menu Selection:

A set of menu items is supplied by the SIM Application ToolKit. The menu selection command can then be used to signal to the SIM Application which menu item is selected.

The commands used for this operation are +STIN, +STGI and +STGR.

Call control by SIM:

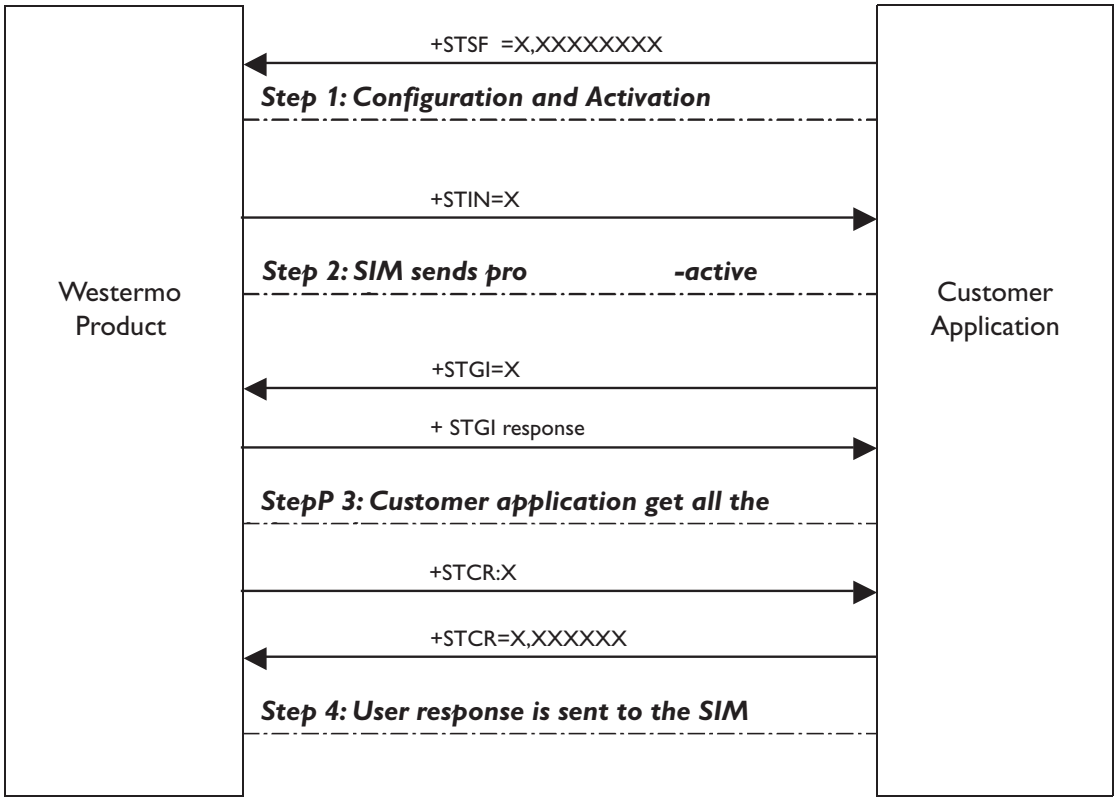
The call control mechanism allows the SIM to check all dialed numbers, supplementary service control strings and USSD strings before connecting to the network. This gives the SIM the ability to allow, bar or modify the string before the operation starts.

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.



On the first step, the customer application informs the WESTERMO product which facilities are supported. This operation is performed with the +STSF (SIM ToolKit Set Facilities) command, which also allows to activate or deactivate the SIM Toolkit functionality.

On the second step, an unsolicited result +STIN (SIM ToolKit indication) is sent by the product, indicating to the customer application which command type the SIM Application Toolkit is running on the SIM card. The last SIM Toolkit indication can be requested by the +STIN? command.

On the third step, the customer application uses the +STGI (SIM ToolKit Get Information) command to get all the information about the SIM ToolKit command, returned by a +STIN message.

On the fourth step, the customer application uses the +STGR (SIM Toolkit Give Response) to send its response (if any) to the SIM ToolKit Application.

The +STCR (SIM Toolkit Control response) indication is an unsolicited result sent by the SIM when Call control functionality is activated and before the customer application has performed any outgoing call, SMS, SS, or USSD.

SIM TOOLKIT COMMANDS

+STSF – SIM ToolKit Set Facilities

Description:

This command allows SIM ToolKit facilities to be activated, deactivated or configured.

Syntax:

+STSF=<mode>[,<config>][,<Timeout>][,<AutoResponse>]

Parameters:

<mode>

0: Deactivates the SIM Toolkit functionalities.
1: Activates the SIM Toolkit functionalities.
2: Configures the SIM Toolkit functionalities.

<Config>

(160060C01F – 5FFFFFFF7F) (hex format)

<Timeout>

Range 1 to 255: Timeout for user responses (multiple of 10 seconds).

<Autoresponse>

0: Automatic response is not activated
1: Automatic response is activated

NOTE:

- 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 for the user action (to select an item, to input a text, etc).
- When <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:

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.

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.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the reporting of mobile equipment errors
AT+WIND=15	OK	Set indications
AT+CPAS	+CPAS: 0 OK	Query ME Status ME is ready.
AT+STSF=?	+STSF: (0-2), (160060C01F – 5FFFFFFF7F), (1-255) OK	Test command SIM ToolKit Set Facilities
AT+STSF?	+STSF: 0,"160060C000",3 OK	No activation of SIM ToolKit functionality
AT+STSF=2,"5FFFFFFF7F"	OK	Set all SIM ToolKit facilities (class 3).
AT+STSF=3	+CME ERROR: 3	Syntax Error
AT+STSF=1	OK	Activation of SIM ToolKit functionality
AT+CFUN=1	OK	Reboot Software.
AT+CPIN?	+CPIN: SIM PIN	Is the ME requiring a password? Yes, SIM PIN required
AT+CPIN=0000	OK	PIN Ok
	+WIND: 4	Init phase is complete
AT+STSF?	+STSF: 1,"5FFFFFFF7F",3 OK	SIM ToolKit functionality activated with all facilities

+STIN, +STRIL – SIM ToolKit Indication

Description:

Unsolicited result code.

In order to allow the customer application to identify the pro-active command sent via SIM ToolKit, a mechanism of unsolicited SIM ToolKit indications (+STIN) is implemented.

Syntax:

+STIN: <CmdType>

Parameters:

<CmdType>

0: a 'Setup Menu' pro-active command has been sent from the SIM.

1: a 'Display Text' pro-active command has been sent from the SIM.

2: a 'Get Inkey' pro-active command has been sent from the SIM.

3: a 'Get Input' pro-active command has been sent from the SIM.

4: a 'Setup Call' pro-active command has been sent from the SIM.

5: a 'Play Tone' pro-active command has been sent from the SIM. (*)

6: a 'Sel Item' pro-active command has been sent from the SIM.

7: a 'Refresh' pro-active command has been sent from the SIM. (*)

8: a 'Send SS' pro-active command has been sent from the SIM. (*)

9: a 'Send SMS' pro-active command has been sent from the SIM. (*)

10: a 'Send USSD' pro-active command has been sent from the SIM. (*)

11: a 'SETUP EVENT LIST' pro-active command has been sent from the SIM.

93: a 'SMS-PP Data Download' failed due to SIM BUSY

94: a 'SMS-PP Data Download' failed due to SIM ERROR

98: a timeout when no response from user.

99: a "End Session" has been sent from the SIM.

(*) if the automatic response parameter is activated, this indication is followed by the corresponding +STGI response.

If the customer application needs to exchange SIM Toolkit message directly with the SIM card, the second indication (+STRIL) give the full command string given by the SIM.

Syntax:

+STRIL: <CmdTreated>,<Command string>

Parameters:

< CmdTreated >

0: The command must be treated by the application.

1: The command is already treated by the modem.

<Command string>

String type; SIM command string in hexadecimal format.

NOTE:

The last SIM toolkit indication sent by the SIM can be requested by the AT+STIN? command. This command is only usable between the sending of the STIN indication by the SIM (step 2: see section 16.2) and the response of the user with the +STGI command (step 3).

Command example	Possible responses	Note
AT+STIN?	+STIN: 0 OK	Ask for the last SIM toolkit indication sent by the SIM The last SIM toolkit indication was a Setup Menu
AT+STGI=0		Display the SIM toolkit application menu
AT+STIN?	+CME ERROR: 4	Ask for the last SIM toolkit indication sent by the SIM Operation not supported, the +STGI command has been already used

+STGI – SIM ToolKit Get Information

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).

Syntax:

+STGI=<CmdType>

Parameters:

<Cmd Type>	Description	Possible responses
0	Get information about 'Setup Menu' pro-active command. No action expected from SIM.	+STGI: <Alpha Identifier menu>+STGI: <Id1>, <NbItems>,<Alpha Id1 Label>,<Help Info> [,<NextActionId>] <CR><LF>+STGI: <Id2>, <NbItems>,<Alpha Id2 Label>,<Help Info> [,<NextActionId>] <CR><LF>[...]]
1	Get information about 'Display text' pro-active command. No action expected from SIM.	+STGI: <Prior>,<Text>, <ClearMode>
2	Get information about 'Get Inkey' pro-active command. SIM expects key pressed (+STGR).	+STGI: <Format>, <HelpInfo>[,<TextInfo>]
3	Get information about 'Get Input' pro-active command SIM expects key input (+STGR)..	+STGI: <Format>, <EchoMode>, <SizeMin>,<SizeMax>, <HelpInfo>[,<TextInfo>]
4	Get information about 'Setup call' pro-active command. SIM expects user authorization (+STGR).	+STGI: <Type>, <CalledNb>, <SubAddress>,<Class>
5	Get information about 'Play Tone' pro-active command. No action.	+STGI: <ToneType> [,<TimeUnit>, <TimeInterval>,<TextInfo>]

Command example	Possible responses	Note
6	Get information about 'Sel Item' pro-active command. SIM expects an item choice (+STGR).	+STGI: <DefaultItem>, <Alpha Identifier menu><CR><LF> +STGI: <Id1>,<NbItems>, <Alpha Id1 Label>,<Help Info>[,<NextActionId>] <CR><LF>+STGI: <Id2>, <NbItems>,<Alpha Id2 Label>,<Help Info> [,<NextActionId>] <CR><LF>[...]]
7	Get information about 'Refresh' pro-active command No action (Refresh done automatically by product)..	+STGI: <RefreshType>
8	Get information about 'Send SS' pro-active command. No action (Send SS done automatically by product).	+STGI:<TextInfo>
9	Get information about 'Send SMS' pro-active command. No action (Send SMS done automatically by product).	+STGI: <TextInfo>
10	Get information about 'Send USSD' pro-active command. No action (Send USSD done automatically by product).	+STGI: <TextInfo>
11	Get information about 'SETUP EVENT LIST' pro-active command.	+STGI: <Evt>

Parameters when CmdType=0 (Setup menu)

<Alpha Identifier menu>

Alpha identifier of the main menu.

<Idx>

Menu item Identifier. (1-255)

<NbItems>

Number of items in the main menu. (1-255)

<Alpha Idx Label>

Alpha identifier label of items in ASCII format.

<HelpInfo>

0: No help information available.

1: Help information available.

<NextActionId>

Contains a pro-active command identifier.(see the table in APPENDIX D)

Compared to other commands the customer application can always get information about setup menu after having received the +STIN:0 indication.

Parameters 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.

Parameters 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.

Parameters when CmdType=3 (Get Input)

<Format>

0: Digit (0-9, *, #,and +)

1: SMS alphabet default.

2: UCS2

3: Unpacked format.

4: Packed format.

<EchoMode>

0: Echo off.

1: Echo on.

<SizeMin>

Minimum length of input. (1-255)

<SizeMax>

Maximum length of input. (1-255)

<HelpInfo>

0: No help information available.

1: Help information available.

<TextInfo>

Text information in ASCII format.

Parameters 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.

2: Fax call

Parameters 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>

Time required expressed in units. (1-255)

<TextInfo>

Text information in ASCII format.

Parameters when CmdType=6 (Sel Item)

<DefaultItem>

Default Item Identifier. (1-255)

<Alpha Identifier menu>

Alpha identifier of the main menu.

<Idx>

Identifier items. (1-255)

<NbItems>

Number of items in the menu. (1-255)

<Alpha Idx Label>

Alpha identifier label of items in ASCII format.

<HelpInfo>

0: No help information available.

1: Help information available.

<NextActionId>

Contains a pro-active command identifier. (see the table in APPENDIX D)

Parameters 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.

Parameters when CmdType=8 (Send SS)

<TextInfo>

Text information in ASCII format.

Parameters when CmdType=9 (Send SMS)

<TextInfo>

Text information in ASCII format.

Parameters when CmdType=10 (Send USSD)

<TextInfo>

Text information in ASCII format.

Parameters 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:

+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.

Command example	Possible responses	Note
		All facilities are activated, the PIN is not required and SIM toolkit functionality is activated.
AT+CMEE=1	OK	Enable the reporting of mobile equipment errors
AT+WIND=15	OK	Set indications result codes
AT+STSF?	+STSF: 1,"5FFFFFFF7F",3 OK	SIM ToolKit functionality activated with all facilities.
	+STIN: 0	The main menu has been sent from the SIM.
AT+STIN?	+STIN: 0 OK	
AT+STGI=0	+STGI: "SIM TOOLKIT MAIN MENU" +STGI: 1,3,"BANK",0 +STGI: 2,3,"QUIZ",0items +STGI: 3,3,"WEATHER",0 OK	Get information about the main menu Main menu contains 3
AT+STIN?	+CME ERROR: 4	

+STCR – SIM ToolKit Control Response

Description:

Unsolicited result code.

When the customer application makes an outgoing call or an outgoing SMS and if the call control facility is activated, CALL CONTROL and SMS CONTROL responses can be identified. This is also applicable to SS calls.

Syntax:

+STCR: <Result>[,<Number>,<MODestAddr>,<TextInfo>]

Parameters:

<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.

+STGR – SIM ToolKit Give Response

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.

Syntax:

+STGR=<CmdType>[,<Result>,<Data>]

Parameters:

<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: Response 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.

Parameters 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.

Parameters when CmdType=1 (Confirm the display text clearing)

No values.

Parameters 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.

Parameters 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 E about the different UCS2 syntaxes).

Parameters when CmdType=4 (Setup call)

<Result>

0: User refuses the call.

1: User accepts call.

Paramters 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

Paramters when CmdType=11 (Setup Event List)

<Result>

1: Idle screen available.

2: User activity event.

Terminal Response to the SIM:

It is possible to send a Terminal Response after the +STIN indication (step 2, cf. §16.2), or after the +STGI command (step 3).

NOTE:

For the SETUP MENU Proactive Command, it is only possible to send a Terminal Response after the +STIN: 0 indication, not after a +STGI=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 B, Table 2. If a Terminal Response is attempted during a incompatible Proactive Command session, a +CME ERROR: 3 will be returned.

Parameters:

- CmdType=95 (Backward Move)
- CmdType=96 (Command beyond ME capabilities)
- CmdType=97 (ME currently unable to process command)
- CmdType=98 (No response from the user)
- CmdType=99 (SIM Toolkit Session aborting by the user)

No values.

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.

Command example	Possible responses	Note
		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	+STGI: 1,3,"BANK",0 +STGI: 2,3,"QUIZ",0 +STGI: 3,3,"WEATHER",0 OK	Get information about the main menu The main menu contains 3 items.
AT+STGR=0,1,1	OK	The item 2 of the main menu has been selected.
	+STIN: 6	The Sel item menu has been sent from the SIM.
AT+STGI=6	+STGI: 1,"BANK +STGI: 1,2,"PERSONAL ACCOUNT ENQUIRY",1" +STGI: 2,2,"NEWS",0 OK	Get information about the BANK menu The BANK menu contains two items.
AT+STGR=6,1,1	OK	Select Item 1.
	+STIN: 3	User request to enter Password sent.
AT+STGI=3	+STGI: 0,0,4,4,0,"Enter Account Password:" OK	Get information about this request
AT+STGR=3,1<CR> >0000<Ctrl Z>	OK	The user enters the Password.
	+STIN:1	A text info has been sent from the SIM.
AT+STGI=1	+STGI: 0,"Password correct, please wait for response",0 OK	Get information about this text.

Command example	Possible responses	Note
	+STIN: 9	SIM requests a bank account update from bank server via the network (SEND SMS)
AT+STGI=9	+STGI: ”Send account balance of user, authorization ok” OK	Get all information about the SEND SMS
		After a short period of time
	+STIN: 5	Transaction is complete: BEEP
AT+STGI=5	+STGI: 9,1,1	Get information about the Tone
	+STIN: 1	Display text indication
AT+STGI=1	+STGI: 0,”Your account balance is 1000 $”,0 OK	

S-register

S0 – Automatic answer

Description:

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

Syntax:

ATS0=<value>

Command example	Possible responses	Note
ATS0=2	OK	Automatic answer after 2 rings
ATS0?	002 OK	Current value is presented with 3 characters padded with zeros
ATS0=0	OK	No automatic answer

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

Appendixes

Codes and values

+CME ERROR – ME error result code:

<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, +WPGW
22	Not found	+CPBF, +CPBP, +CPBN, +CGSN, +WOPN, ATD>[mem]"name"
24	Text string too long	+CPBW, +CPIN, +CPIN2, +CLCK, +CPWD, +WPGW, +WCCS
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

<error>	Meaning	Resulting from the following commands
32	Network not allowed – emergency calls only	+COPS
40	Network personalization PIN required (Network lock)	All GSM 07.07 commands (+CME ERROR: 40)
42	Network personalization PIN required (Network subset lock)	All GSM 07.07 commands (+CME ERROR: 42)
44	Network personalization PIN required (Service Provider lock)	All GSM 07.07 commands (+CME ERROR: 44)
46	Network personalization PIN required (Corporate lock)	All GSM 07.07 commands (+CME ERROR: 46)
103	Incorrect MS identity.	+CGATT
106	ME is blacklisted by the network.	+CGATT
107	MS is not allowed to operate in GPRS.	+CGATT
111	MS is not allowed to operate in the requested PLMN.	+CGATT
112	MS is not allowed to make location updating in this area.	+CGATT
113	Roaming in this location area is not allowed.	+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

+CMS ERROR – Message service failure result code

<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 or ME memory full	+CMGW
330	SC address unknown	+CSCA?, +CMSS, +CMGS
340	no +CNMA acknowledgement expected	+CNMA

Specific error result codes

<error>	Meaning	Resulting 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 ATH0, ATH1, AT+WIOR, 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 the product to activate or change a new echo cancellation algorithm.	+ECHO, +VIP
520	Automatic abort about get PLMN list for an incoming call.	+COPS=?
526	PIN deactivation forbidden with this SIM card.	+CLCK
527	Please wait, RR or MM is busy. Retry your selection later.	+COPS
528	Location update failure. Emergency calls only.	+COPS
529	PLMN selection failure. Emergency calls only.	+COPS
531	SMS not sent: the <da> is not in FDN phonebook, and FDN lock is enabled. (for SMS)	+CMGS, +CMSS (+CMS ERROR: 531)
532	the embedded application is activated so the objects flash are not erased	+WOPEN
533	Missing or Unknown APN	ATD*99 +GACT +CGDATA

<error>	Meaning	Resulting from the following commands
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

+CEER – Failure Cause from GSM 04.08 recommendation

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

Cause value	Diagnostic
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	Inter-working, unspecified
224	MS requested detach
225	NWK requested Detach
226	Unsuccessful attach cause NO SERVICE
227	Unsuccessful attach cause NO ACCESS
228	Unsuccessful attach cause GPRS SERVICE REFUSED
229	PDP Deactivation requested by NWK
230	PDP Deactivation because 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
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

+C–EER – Specific Failure Cause for

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 since the equipment sending. 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).

Error #	Error label	Description
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 not be provided by the network because the user has not completed the necessary administrative arrangements with its supporting networks.
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 (both 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.

Error #	Error label	Description
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. 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	Inter-working, unspecified	There has been inter-working with a network which does not provide causes for actions it takes; thus, the precise cause for a message which is being sent cannot be ascertained.

All values other than specified should be treated as error #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>] +CDS: <fo>, <mr>... (text mode)	As verbose	Call Waiting number
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:<mode>, <stat>[,<lac>,<ci>]	As verbose	Network registration indication
+CRING: <type>	As verbose	Incoming call type (VOICE, FAX ...)
+CSQ: <RxLev>,99	As verbose	Automatic RxLev indication with AT+CCED=1,8 command

Verbose result code	Numeric (V0 set)	Description
+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 command)
+WDCI: <LineId>, <Status>	As verbose (specific)	Diverted call indicator
RING	2	Incoming call signal from network
+WBCI	As Verbose (specific)	Battery charge indication
+CIEV	As Verbose (specific)	Indicator event reporting
+WAGI: <date string>, <time string>, <category> <alarm_offset>, <frequency>, <description>, <index>	As verbose	Appointment notification
+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

Parameters storage

	Parameters storage mode				
Command	**AT&W (E2P)**	**Command (E2P)**	**AT+CSAS (SIM, E2P)**	**AT&F (SIM, E2P)**	**Default values**
General commands					
+CMEE	X			X	0
+CRSL		X		X	6
+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 WISMO 2 and 3		X		X	For ,1,0,3,10,7 (Algo ID 1) ,3,30,8000, 256 (Algo ID 3) For WISMO 5: ,3,30,8000, 256 (Algo ID 3)
+SIDET	X			X	1,1
+SPEAKER	X			X	0 (Speaker 1 &Micro 1)
+VGR	X			X	64 (speaker 1) 32 (speaker 2)
+VGT	X			X	64 (mic 1 & ctrl 1) 0 (others)

	Parameters storage mode				
Command	**AT&W (E2P)**	**Command (E2P)**	**AT+CSAS (SIM, E2P)**	**AT&F (SIM, E2P)**	**Default values**
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

	Parameters storage mode				
Command	**AT&W (E2P)**	**Command (E2P)**	**AT+CSAS (SIM, E2P)**	**AT&F (SIM, E2P)**	**Default values**
Fax Class 2 commands					
+FBOR	X			X	0
+FCQ	X			X	0
+FCR	X			X	1
+FDCC,+FDIS	X			X	0,5,0,0,2, 0,0,0,0
+FPHCTO	X			X	30
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 2,0 for MBN 4,0 for DCI
+WBCM		X		X	0,0,4200, 3300,100, 5000,0
+WBHV		X		X	0,0 1,0
+WBM		X			0,0 for SPI bus 0,4 for I2C Soft bus

	Parameters storage mode				
Command	**AT&W (E2P)**	**Command (E2P)**	**AT+CSAS (SIM, E2P)**	**AT&F (SIM, E2P)**	**Default values**
3+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 for P51xx 2,1 (according to voice CODEC capabilities) for Q24xx and Q2501
+WIND		X		X	0
+WIOM		X			1023,0 (for Q2xxx and P3xxx) 0,0 (for Q31 and P51 GSM engines)
+WRIM		X		X	0
+WSVG		X		X	0
+WVR		X			5,0
+WMFM	X	X		X	1: UART1 is activated, other ports are deactivated. 0: data flow is directed to UART1
SIM Toolkit commands					
+STSF		X			0,"1600 60C01 F",3,0

	Parameters storage mode				
Command	**AT&W (E2P)**	**Command (E2P)**	**AT+CSAS (SIM, E2P)**	**AT&F (SIM, E2P)**	**Default values**
GPRS commands					
+CGAUTO	X			X	3
+CGCLASS		X			"B"
+CGDCONT		x			
+CGEREP	X			X	0
+CGREG	X			X	0
+CGSMS		X			1
+WGPRS		X			0,1 1,0 3,0 5,0 6,0

GSM sequences list

In accordance with GSM 02.30, the product supports the following GSM sequences, which can be used through the ATD and the +CKPD commands.

Security	
Change PIN code	**04*OLDPIN*NEWPIN*NEWPIN#
Change PIN2 code	**042*OLDPIN2*NEWPIN2*NEWPIN2#
Unlock PIN code	**05*PUK*NEWPIN*NEWPIN#
Unlock PIN2 code	**052*PUK2*NEWPIN2*NEWPIN2#
Show the IMEI number	*#06#

Call forwarding

Please refer to SC and BS values below in this paragraph.

Activate	*SC#
Or	*SC**BS#
Register and activate	**SC*PhoneNumber#
Or	**SC*PhoneNumber*BS#
Or	**SC*PhoneNumber*[BS]*T#
Or	*SC*PhoneNumber#
Or	*SC*PhoneNumber*BS#
Or	*SC*PhoneNumber*[BS]*T#
Check status	*#SC#
Or	*#SC**BS#
Deactivate	#SC#
Or	#SC**BS#
Unregister and deactivate	##SC#
Or	##SC**BS#

Service Codes (SC)		Network Service Codes (BS)	
002	all call forwarding	No code	All tele and bearer services
004	all conditional call forwarding	10	All tele-services
21	call forwarding unconditional	11	Telephony
61	call forwarding on no answer	12	All data tele-services
62	call forwarding on not reachable	13	Fax services
67	call busy	16	Short Message Services
		17	Voice Group Call Service
		18	Voice Broadcast Service
		19	All tele-services except SMS
		20	All bearer services
		21	All asynchronous services
		22	All synchronous services
		24	All data circuit synchronous
		25	All data circuit asynchronous

NOTE:

The no-reply condition timer (T), is only used for SC = 002, 004 or 61.

Call barring

Please refer to SC values below in this paragraph. BS values are the same as above.

Activate	*SC*Password#
or	*SC*Password*BS#
Check status	*#SC#
or	*#SC**BS#
Deactivate	#SC*Password#
or	#SC*Password*BS#
Change password for call barring	**03*330*OLDPWD*NEWPWD*NEWPWD#
or	**03**OLDPWD*NEWPWD*NEWPWD#
or	*03*330*OLDPWD*NEWPWD*NEWPWD#
or	*03**OLDPWD*NEWPWD*NEWPWD#

Service Codes (SC)	
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)

Call waiting

BS values are the same as above.

Activate	*43*BS#
Check status	*#43*BS#
Deactivate	#43*BS#

Number presentation

CLIP check status	*#30#
CLIR check status	*#31#
Suppress CLIR for a voice call	*31#PhoneNumber
Invoke CLIR for a voice call	#31#PhoneNumber
COLP check status	*#76#

Operator names

This list is extracted from the SE13 (May 11th 2004 edition) and the NAPRD_10_2_6_2 documents. Note that Country Initials may vary for the same MCC (Mobile Country Code) without any impact. The following list is sorted by MCC and MNC.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
GRC	202	1	GR COSMOTE	C-OTE
GRC	202	5	vodafone GR	voda GR
GRC	202	9	GR Q-TELECOM	Q-TELCOM
GRC	202	10	TIM GR	TIM
NLD	204	4	vodafone NL	voda NL
NLD	204	8	NL KPN	NL KPN
NLD	204	12	NL Telfort	NL Tlfrt
NLD	204	16	T-Mobile NL	TMO NL
NLD	204	20	Orange NL	Orange
BEL	206	1	BEL PROXIMUS	PROXI
BEL	206	10	B mobistar	mobi*
BEL	206	20	BASE	BASE
FRA	208	1	Orange F	Orange
FRA	208	–0	F - BOUYGUES TELECOM	BYTEL
FRA	208	10	F SFR	SFR
FRA	208	20	F – BOUYGUES TELECOM	BYTEL
AND	213	3	STA-MOBILAND	M-AND
ESP	214	1	vodafone ES	voda ES
ESP	214	3	E AMENA	AMENA
ESP	214	7	MOVISTAR	MSTAR
HUN	216	1	H PANNON GSM	PANNON
HUN	216	30	T-Mobile H	TMO H
HUN	216	70	vodafone HU	voda HU
BIH	218	3	BA-ERONET	ERONET
BIH	218	5’	MOBI'S	’MOBI'S
BIH	218	90	BH GSMBIH	GSMBIH
HRV	219	1	HTmobile HR	HTmobile
HRV	219	10	HR VIP	VIP
SCG	220	1	YU MOBTEL	MOBTEL
SCG	220	2	ProMonte	ProMonte
SCG	220	3	YUG 03	SCGTS
SCG	220	4	MONET	MONET

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
ITA	222	1	I TIM	TIM
ITA	222	10	vodafone IT	voda IT
ITA	222	88	I WIND	I WIND
ITA	222	99	3 ITA	3 ITA
ROU	226	1	RO CONNEX	CONNEX
ROU	226	3	RO Cosmorom	Cosmorom
ROU	226	10	RO ORANGE	ORANGE
CHE	228	1	SWISS GSM	SWISS
CHE	228	2	sunrise	sunrise
CHE	228	3	orange CH	ORANGE
CZE	230	1	T-Mobile CZ	TMO CZ
CZE	230	2	EUR–TEL - C–	ET - CZ
CZE	230	3	OSKAR	OSKAR
SVK	231	1	Orange SK	Orange
SVK	231	2	EUROTEL-SK	ET-SK
AUT	232	1	A1	A1
AUT	232	3	T-Mobile A	TMO A
AUT	232	5	one	one
AUT	232	7	A tele.ring	telering
AUT	232	10	3 AT	3 AT
GBR	234	1–	O2 - U–	O2 -UK
GBR	234	15	vodafone UK	voda UK
GBR	234	20	3 UK	3 UK
GBR	234	30	T-Mobile UK	TMO UK
GBR	234	31	T-Mobile UK	TMO UK
GBR	234	32	T-Mobile UK	TMO UK
GBR	234	33	Orange	Orange
GBR	234	50	JT GSM	JT GSM
GBR	234	55	Cable & Wireless Guernsey	C&W
GBR	234	58	Manx Pronto	Pronto
DNK	238	1	TDC MOBIL	DK TDC
DNK	238	2	DK SONOFON	SONO
DNK	238	6	3 DK	3 DK
DNK	238	20	TELIA DK	TELIA
DNK	238	30	Orange	Orange
SWE	240	1	TELIA S	TELIA

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
SWE	240	2	3 SE	3 SE
SWE	240	4	SWEDEN	SWE
SWE	240	5	Sweden 3G	Sweden3G
SWE	240	7	S COMVIQ	IQ
SWE	240	8	vodafone SE	voda SE
SWE	240	10	SpringMobil SE	Spring
NOR	242	1	N Telenor	TELENOR
NOR	242	2	N NetCom GSM	N COM
FIN	244	3	FINNET	FINNET
FIN	244	5	FI elisa	elisa
FIN	244	12	FINNET	FINNET
FIN	244	14	FI AMT	FI AMT
FIN	244	91	FI SONERA	SONERA
LTU	246	1	OMNITEL LT	OMT
LTU	246	2	LT BITE GSM	BITE
LTU	246	3	TELE2	TELE2
LVA	247	1	LV LMT GSM	LMT GSM
LVA	247	2	LV TELE2	TELE2
EST	248	1	EE EMT GSM	EMT
EST	248	2	EE RLE	RLE
EST	248	3	TELE2	TELE2
RUS	250	1	MTS-RUS	MTS
RUS	250	2	MegaFon RUS	MegaFon
RUS	250	4	SIBCHALLENGE RUS	RUS_SCN
RUS	250	5	SCS RUS	SCS
RUS	250	7	RUS SMARTS	SMARTS
RUS	250	10	RUS DTC	DTC
RUS	250	11	ORENSOT	ORENSOT
RUS	250	12	RF FAR EAST	RF FEast
RUS	250	13	RUS Kuban-GSM	KUGSM
RUS	250	14	RUS Di-ex	Di-ex
RUS	250	15	RUS SMARTS	SMARTS
RUS	250	16	RUS16	NTC
RUS	250	17	RUS 17	ERMAK
RUS	250	19	RUS_BASHCELL	BASHCELL
RUS	250	20	RUS 20	MOTIV

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
RUS	250	28	Bee Line	Bee Line
RUS	250	39	Uraltel	RUS39
RUS	250	44	RUS North Caucasian GSM	NC-GSM
RUS	250	92	Primetelefone RUS	Primtel
RUS	250	99	Bee Line	Bee Line
UKR	255	1	UA UMC	UMC
UKR	255	2	UKR-WellCOM	WellCOM
UKR	255	3	UA-KYIVSTAR	UA-KS
UKR	255	5	UA-GT	GT
BLR	257	1	BY VELCOM	VELCOM
BLR	257	2	MTS BY	MTS
MDA	259	1	MD VOXTEL	VOXTEL
MDA	259	2	MD MOLDCELL	MDCELL
POL	260	1	Plus GSM	PLUS
POL	260	2	Era	Era
POL	260	3	PL IDEA	IDEA
DEU	262	1	T-Mobile D	TMO D
DEU	262	2	Vodafone.de	voda DE
DEU	262	3	E-Plus	E-Plus
DEU	262	–	o2 - d–	o2 - de
GIB	266	1	GIBTEL GSM	GIBTEL
PRT	268	1	vodafone P	voda P
PRT	268	3	P OPTIMUS	OPTIM
PRT	268	6	P TMN	TMN
LUX	270	1	L LUXGSM	LUXGSM
LUX	270	77	L TANGO	TANGO
LUX	270	99	L-VOX.mobile	VOX.LU
IRL	272	1	vodafone IE	voda IE
IRL	272	–	02 - IR–	02 -IRL
IRL	272	–	3–IRL - METEOR	METEOR
ISL	274	1	IS SIMINN	SIMINN
ISL	274	2	Og Vodafone	Vodafone
ISL	274	3	Og Vodafone	Vodafone
ISL	274	4	Viking	Viking
ALB	276	1	–AMC - AL	A M C
ALB	276	2	vodafone AL	voda AL

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
MLT	278	1	vodafone MT	voda MT
MLT	278	21	go mobile	gomobile
CYP	280	1	CY CYTAGSM	CY-GSM
CYP	280	10	areeba	areeba
GEO	282	1	GEO-GEOCELL	GCELL
GEO	282	2	MAGTI-GSM-GEO	MAGTI
ARM	283	1	RA-ARMGSM	ARMMO1
ARM	283	4	RA 04	RA 04
BGR	284	1	M-TEL GSM BG	M-TEL
BGR	284	5	BG GLOBUL	GLOBUL
TUR	286	1	TR TURKCELL	TCELL
TUR	286	2	TR TELSIM	TELSIM
TUR	286	3	TR ARIA	ARIA
TUR	286	4	TR AYCELL	AYCELL
FRO	288	1	Føroya Tele	FT-GSM
FRO	288	2	KALL	KALL
GRL	290	1	TELE Greenland	TELE GRL
SVN	293	40	SI vodafone	SI voda
SVN	293	41	SI MOBITEL GSM	SI-GSM
SVN	293	70	SI VEGA 070	VEGA 070
MKD	294	1	MKD-MOBIMAK	MOBI-M
MKD	294	2	MKD COSMOFON	COSMOFON
LIE	295	1	FL GSM	FLGSM
LIE	295	2	Orange FL	OFL
LIE	295	5	FL1	FL1
LIE	295	77	LI TANGO	TANGO
CAN	302	370	Fido	Fido
CAN	302	720	Rogers AT&T Wireless	ROGERS
USA	310	20	Union Telephone	Union Tel
USA	310	26	T-Mobile	TMO
USA	310	30	Centennial Wireless	Centennial
USA	310	31	T-Mobile	TMO
USA	310	40	Cellular One	Cellular One
USA	310	50	DIGICEL	JAM DC
USA	310	70	Highland Cellular	Highland
USA	310	80	Corr Wireless	Corr

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
USA	310	100	Plateau Wireless	Plateau
USA	310	150	Cingular Wireless	Cingular
USA	310	160	T-Mobile	T-Mobile
USA	310	170	Cingular Wireless	Cingular
USA	310	180	West Central Wireless	West Central
USA	310	190	Alaska Wireless	Alaska Wireless
USA	310	200	T-Mobile	T-Mobile
USA	310	210	T-Mobile	T-Mobile
USA	310	220	T-Mobile	T-Mobile
USA	310	230	T-Mobile	T-Mobile
USA	310	240	T-Mobile	T-Mobile
USA	310	250	T-Mobile	T-Mobile
USA	310	260	T-Mobile	T-Mobile
USA	310	270	T-Mobile	T-Mobile
USA	310	310	T-Mobile	T-Mobile
USA	310	311	FARMERS	FARMERS
USA	310	320	–USA - CellularOne	Cell
USA	310	340	WestLink Comm	WestLink
USA	310	350	Carolina Phone	Carolina
USA	310	380	AT&T Wireless	AT&T
USA	310	390	Yorkville Telephone	Yorkville
USA	310	410	Cingular Wireless	Cingular
USA	310	420	Cincinnati Bell Wireless	CBW
USA	310	450	Viaero Wireless	Viaero
USA	310	460	USA ONELINK	ONELINK
USA	310	490	SunCom	SunCom
USA	310	500	PSC Wireless	PSC
USA	310	530	West Virginia Wireless	WVW
USA	310	560	Cellular One DCS	Cell One
USA	310	580	T-Mobile	T-Mobile
USA	310	590	–USA - Extended Area	ROAMING
USA	310	610	Epic Touch	EpicTouch
USA	310	630	AmeriLink PCS	AmeriLink
USA	310	640	Einstein PCS	Einstein
USA	310	660	T-Mobile	T-Mobile
USA	310	670	Wireless 2000 PCS	W 2000 PCS

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
USA	310	680	NPI Wireless	NPI
USA	310	690	Immix Wireless	IMMIX
USA	310	740	Telemetrix	Telemetrix
USA	310	760	PTSI	PTSI
USA	310	770	IWS	IWS
USA	310	780	AirLink PCS	AirLink
USA	310	790	Pinpoint	Pinpoint
USA	310	800	T-Mobile	T-Mobile
USA	310	870	US	PACE
USA	310	880	USAACSI	ACSIAC
USA	310	910	USAFC	FCSI
USA	310	940	Digital Cellular	DCT
USA	310	950	USA XIT Cellular	XIT
USA	310	980	AT&T Wireless	AT&T
USA	311	0	Wilkes USA	WILKES
USA	311	1	Wilkes USA	WILKES
USA	311	5	Wilkes USA	WILKES
USA	311	30	Indigo	Indigo
USA	311	70	USAEC	EASTER
USA	311	80	Pine Cellular	PINECell
USA	311	110	High Plains	HPW
USA	311	140	Sprocket	Sprocket
USA	311	160	EMW	EMW
USA	311	170	PetroCom	PetroCom
USA	311	190	USAC1ECI	C1ECI
USA	332	11	Blue Sky	Blue Sky
MEX	334	3	MX MOVISTAR GSM	MOVISTAR
MEX	334	20	Telcel GSM	TELCEL
JAM	338	5	JM DIGICEL	DIGICEL
JAM	338	180	C&W	C&W
FRA	340	1	F-Orange	Orange
GLP	340	8	AMIGO	AMIGO
FRA	340	20	BOUYGTEL-C	BOUYG-C
BRB	342	50	JM Digicel	Digicel
BRB	342	600	C&W	C&W
BRB	342	810	AT&T Wireless	AT&T

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
ATG	344	30	APUA-PCS ANTIGUA	APUA-PCS
ATG	344	920	C&W	C&W
ATG	344	930	AT&T Wireless	AT&T
CYM	346	140	C&W	C&W
VGB	348	570	CCT Boatphone	CCTBVI
BMU	350	2	BTC MOBILITY LTD.	MOBILITY
BMU	350	10	AT&T Wireless	AT&T
GRD	352	30	AT&T Wireless	AT&T
GRD	352	50	Digicel	DIGICEL
GND	352	110	C&W	C&W
GRD	352	130	TWTCGN	TWTCGN
MS	354	860	C&W	kan
KNA	356	110	C&W	C&W
LCA	358	30	AT&T Wireless	AT&T
SLU	358	110	C&W	C&W
VCT	360	10	AT&T Wireless	AT&T
VCT	360	110	C&W	C&W
ANT	362	51	Telcell GSM	Telcell
ANT	362	69	ANT CURACAO TELECOM GSM	CT GSM
ANT	362	91	UTS Wireless Curacao N.V.	UTS
ABW	363	1	SETAR GSM	SETARGSM
BHS	364	39	BaTelCell	BaTelCel
AIA	365	840	C&W	C&W
DMA	366	20	AT&T Wireless	AT&T
DMA	366	110	C&W	C&W
CUB	368	1	CU/C_COM	C_COM
DO	370	1	ORANGE	ORANGE
TTO	374	12	TSTT	TSTT
TCA	376	350	C&W	C&W
AZE	40–	1	AZE - AZERCELL GSM	ACELL
AZE	400	2	BAKCELL GSM 2000	BKCELL
KAZ	401	1	KZ K-MOBILE	K-MOBILE
KAZ	401	2	KZ KCELL	KCELL
BTN	402	11	BT B-Mobile	B-Mobile
IND	404	1	Hutch	Hutch

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
IND	404	2	AirTel	AirTel
IND	404	3	AirTel	AirTel
IND	404	4	IDEA	IDEA
IND	404	5	Hutch	Hutch
IND	404	7	IDEA	IDEA
IND	404	10	AirTel	AirTel
IND	404	11	Hutch	Hutch
IND	404	12	INDEH	ESCOTEL
IND	404	13	Hutch	Hutch
IND	404	14	INA SPICE	SPICE
IND	404	15	Hutch	Hutch
IND	404	19	INDEK	ESCOTEL
IND	404	20	Orange	Orange
IND	404	21	BPL MOBILE	BPL MOBILE
IND	404	22	IDEA	IDEA
IND	404	24	IDEA	IDEA
IND	404	27	BPL MOBILE	BPL MOBILE
IND	404	30	Hutch	Hutch
IND	404	31	AirTel	AirTel
IND	404	34	BSNL MOBILE	CellOne
IND	404	38	BSNL MOBILE	CellOne
IND	404	40	IND AIRTEL	AIRTEL
IND	404	41	INA RPG	RPG
IND	404	42	INA AIRCEL	AIRCEL
IND	404	43	BPL MOBILE	BPL MOB
IND	404	44	INA SPICE	SPICE
IND	404	45	AirTel	AirTel
IND	404	46	BPL MOBILE	BPL MOB
IND	404	49	AirTel	AirTel
IND	404	51	BSNL MOBILE	CellOne
IND	404	53	BSNL MOBILE	CellOne
IND	404	54	BSNL MOBILE	CellOne
IND	404	55	BSNL MOBILE	CellOne
IND	404	56	INDEU	ESCOTEL
IND	404	57	BSNL MOBILE	CellOne
IND	404	58	BSNL MOBILE	CellOne

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
IND	404	59	BSNL MOBILE	CellOne
IND	404	60	Hutch	Hutch
IND	404	62	BSNL MOBILE	CellOne
IND	404	64	BSNL MOBILE	CellOne
IND	404	66	BSNL MOBILE	CellOne
IND	404	68	IN-DOLPHIN	DOLPHIN
IND	404	69	IN-DOLPHIN	DOLPHIN
IND	404	70	INDH1	Oasis
IND	404	71	BSNL MOBILE	CellOne
IND	404	72	BSNL MOBILE	CellOne
IND	404	73	BSNL MOBILE	CellOne
IND	404	74	BSNL MOBILE	CellOne
IND	404	75	BSNL MOBILE	CellOne
IND	404	76	BSNL MOBILE	CellOne
IND	404	77	BSNL MOBILE	CellOne
IND	404	78	IDEA	IDEA
IND	404	79	BSNL MOBILE	CellOne
IND	404	80	BSNL MOBILE	CellOne
IND	404	81	BSNL MOBILE	CellOne
IND	404	84	Hutch	Hutch
IND	404	86	Hutch	Hutch
IND	404	88	Hutch	Hutch
IND	404	90	AirTel	AirTel
IND	404	92	AirTel	AirTel
IND	404	93	AirTel	AirTel
IND	404	94	AirTel	AirTel
IND	404	95	AirTel	AirTel
IND	404	96	AirTel	AirTel
IND	404	97	AirTel	AirTel
IND	404	98	AirTel	AirTel
PAK	410	1	PK MK	PMCL
PAK	410	3	PK-UFONE	UFONE
PAK	41–	4	PAK - PL	PAKTEL
AFG	412	1	AF AWCC	AWCC
AFG	412	20	AF TDCA	TDCA
SRI	413	1	Mobitel	MOBITEL

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
SRI	413	2	SRI DIALOG	DIALOG
SRI	41–	3	SRI - CELLTEL	CELLTEL
MMR	414	1	MM 900	MPTGSM
LBN	415	1	RL Cellis	CLLIS
LBN	415	3	RL LibanCell	LibCL
JOR	416	1	Fastlink	FSTLNK
JOR	416	77	JO MobCom	MobCom
SYR	417	1	SYRIATEL	SYRIATEL
SYR	417	2	94 SYRIA	94 SYRIA
SYR	417	9	SYR MOBILE SYR	MOBILE
IRQ	418	0	ASIACELL	ASIACELL
IRQ	418	2	SanaTel	SanaTel
IRQ	418	5	ASIACELL	ASIACELL
IRQ	418	8	SanaTel	SanaTel
IRQ	418	20	Atheer Iraq	ATHEER
IRQ	418	30	IRAQNA	IRAQNA
KWT	419	2	KT MTCNet	MTC
KWT	419	3	KT WATANIYA	WATANIYA
KSA	420	1	ALJAWAL	KSA
YEM	421	1	SabaFon	SABAFON
YEM	421	2	SPACETEL	SPACETEL
OMN	422	2	OMAN MOBILE	OMAN
UAE	424	2	UAE ETISALAT	ETSLT
ISR	425	1	IL ORANGE	ORANGE
ISR	425	2	IL Cellcom	Cellcom
ISR	425	5	JAWWAL-PALESTINE	JAWWAL
BHR	426	1	BATELCO	BATELCO
BHR	426	2	MTC VODAFONE BH	MTC-VFBH
QAT	427	1	QAT QATARNET	Q-NET
MNG	428	99	MN MobiCom	MobiCom
IRN	432	11	IR-TCI	432 11
IRN	432	14	IR KISH	KIFZO
IRN	432	19	IR MTCE	MTCE
UZB	434	2	UZMACOM	UZMGSM
UZB	434	4	UZB DAEWOO-GSM	DW-GSM
UZB	434	5	UZB CSOCOM GSM	COSCOM

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
UZB	434	7	UZB-UZD	UZDGSM
TJK	436	1	Somoncom	Somoncom
TJK	436	2	Indigo-T	INDIGO
TJK	436	3	TJK MLT	MLT
TJK	436	4	Babilon-M	Babilon
TJK	43–	5	TJT - Tajik Tel	TajikTel
KGZ	437	1	BITEL KGZ	BITEL
JPN	440	10	JP DoCoMo	DoCoMo
JPN	440	20	Vodafone JP	Voda JP
KOR	450	2	KR KTF	KTF
KOR	450	8	KR KTF	KTF
VNM	452	1	VN MOBIFONE	VMS
VNM	452	2	VN VINAPHONE	GPC
VNM	452	4	VNM and VIETTEL	VIETTEL
HKG	454	0	CSL	CSL
HKG	454	3	3 HK	3
HKG	454	4	HK ORANGE	ORANGE
HKG	454	6	SmarTone	SmarTone
HKG	454	10	HK NEW WORLD	NWPCS
HKG	454	12	HK PEOPLES	PEOPLES
HKG	454	15	SmarTone 3G	SMC 3G
HKG	45S	–	Sunday SUNDAY	SUNDAY
MAC	455	0	Macau SMC	SmarTone
MAC	455	1	MAC-CTMGSM	CTMGSM
MAC	455	3	Hutchison MAC	HT Macau
KHM–456	1	–	MOBITEL - KHM	MT-KHM
KHM	456	2	KHM-Hello GSM	KHM-SM
KHM	456	18	CAMBODIA SHINAWATRA	CAMSHIN
LAO	457	1	LAO GSM	LAO GSM
LAO	457	2	ETL MOBILE NETWORK	ETLMNW
LAO	457	3	45703	LATMOBIL
LAO	457	8	TANGO LAO	TANGO
CHN	460	0	CHINA MOBILE	CMCC
CHN	460	1	CHN-CUGSM	CU-GSM
TWN	466	1	Far EasTone	FET
TWN	466	6	TWN Tuntex GSM 1800	TUNTEX

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
TWN	466	68	ACeS	ACeS
TWN	466	88	KGT-Online	KGT
TWN	466	89	T3G	T3G
TWN	466	92	Chunghwa	CHT
TWN	466	93	TWN MOBITAI	TW MOB
TWN	466	97	TWN GSM 1800	TCC
TWN	466	99	TransAsia	TransAsi
PRK	467	3	KP SUN	SUNNET
BGD	470	1	BGD-GP	GP
BGD	470	2	BGD AKTEL	AKTEL
BGD	470	3	BD ShebaWorld	SHEBA
MDV	472	1	MV DHIMOBILE	D-MOBILE
MYS	502	12	MY MAXIS	MY MAXIS
MYS	502	16	DiGi	DiGi
MYS	502	19	MY CELCOM	CELCOM
AUS	505	1	Telstra Mobile	Telstra
AUS	505	2	YES OPTUS	Optus
AUS	505	3	vodafone AU	voda AU
AUS	505	6	3 AUS	3 AUS
IDN	510	0	ACeS	ACeS
IDN	510	1	IND INDOSAT	INDOSAT
IDN	510	8	LIPPO TEL	LIPPOTEL
IDN	510	10	IND TELKOMSEL	T-SEL
–DN	510	11	IND - Excelcom	proXL
IDN	510	21	IND INDOSAT	INDOSAT
TLS	514	2	TLS-TT	TT
PHL	515	1	ISLACOM	ISLACOM
PHL	515	2	Globe Telecom-PH	GLOBE
PHL	515	3	SMART	SMART
PHL	515	5	PH Sun Cellular	SUN
PHL	515	11	ACeS	ACeS
THA	520	1	TH GSM	TH GSM
THA	520	15	TH ACT 1900	ACT-1900
THA	520	18	TH-DTAC	DTAC
THA	520	20	ACeS	ACeS
THA	520	23	TH GSM 1800	GSM 1800

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
THA	520	99	Orange Th	Orange
SGP	525	1	SingTel	SingTel
SGP	525	2	SingTel-G18	SingTel
SGP	525	3	SGP-M1-3GSM	M1-3GSM
SGP	525	5	STARHUB-SGP	STARHUB
NZL	530	1	vodafone NZ	voda NZ
PNG	537	1	PNGBMobile	BMobile
TON	539	1	U-CALL	U-CALL
VUT	541	1	VUT SMILE	SMILE
FJI	542	1	FJ VODAFONE	VODAFONE
AS	544	11	Blue Sky	Blue Sky
KIR	545	9	KL-Frigate	KI-FRIG
NCL	546	1	NCL MOBILIS	MOBNCL
FRA	547	20	F-VINI	VINI
COK	548	1	CK KOKANET	KOKANET
FSM	550	1	FSM Telecom	FSMTC
EGY	602	1	EGY MobiNiL	MobiNiL
EGY	602	2	vodafone EG	voda EG
DZA	603	1	ALGERIAN MOBILE NETWORK	AMN
DZA	603	2	Djezzy	Djezzy
DZA	603	3	DZA-WTA	WTA
MOR	604	0	MOR MEDITEL	MEDITEL
MOR	604	1	MOR IAM	IAM
TUN	605	2	TUNISIE TELECOM	TUNTEL
TUN	605	3	TUNISIANA	TUNSIANA
GMB	607	1	GAMCEL	GAMCEL
GMB	607	2	AFRICELL	AFRICELL
SEN	608	1	SN ALIZE	ALIZE
SEN	608	2	SN-SENTEL SG	SENTEL
MRT	609	1	MR MATTEL	MATTEL
MRT	609	10	MAURITEL	MAURITEL
MLI	610	1	MALITEL ML	MALITEL
MLI	610	2	IKATEL ML	IKATEL
GIN	611	2	GN LAGUI	LAGUI
CIV	612	3	Orange CI	Orange

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
CIV	612	5	TELECEL-CI	TELCEL
BFA	613	2	BF Celtel	celtel
NER	614	2	NE CELTEL	NECELTEL
NER	614	3	NE TELECEL	TELECEL
TGO	615	1	TG-TOGO CELL	TGCELL
BEN	616	2	TELECEL BENIN	TLCL-BEN
BEN	616	3	BJ BENINCELL	BENCELL
BEN	616	4	BELL BENIN COMMUNICATION	BBCOM
MRU	617	1	CELLPLUS-MRU	CELL +
MRU	617	10	EMTEL-MRU	EMTEL
LBR	618	1	LBR Lonestar Cell	LoneStar
LBR	618	2	LIBERCELL	LIBERCEL
SLE	619	1	CELTEL SL	CELTEL
SLE	619	2	MILLICOM SL	MILLICOM
GHA	620	1	GH SPACEFON	SPACE
GHA	620	2	GH ONEtouch	ONEtouch
GHA	620	3	GH-MOBITEL	mobitel
NGA	621	20	ECONET NG	ECONET
–GA	621	30	MTN - NG	MTN-NG
NGA	621	40	NG Mtel	Mtel
NGA	621	50	Glo NG	glo
TCD	622	1	CELTEL TCD	CELTEL
TCD	622	2	TD LIBERTIS	LIBERTIS
CMR	624	1	MTN CAM	62401
CMR	624	2	Orange CAM	Orange
CPV	625	1	CPV MOVEL	CMOVEL
STP	626	1	STP CSTmovel	CSTmovel
GNQ	627	1	GNQ01	GETESA
GAB	628	1	LIBERTIS	LIBERTIS
GAB	628	2	GAB TELECEL	TELECEL
GAB	628	3	CELTEL GA	CELTEL
COG	629	1	CELTEL CD	CELTEL
COG	629	10	COG LIBERTIS	LIBERTIS
COD	630	1	VODACOM CD	VODACOM
COD	630	2	CELTEL RC	CELTEL

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
COD	630	4	CELLCO GSM	CELLCO
COD	630	89	CD OASIS	OASIS
AGO	631	2	UNITEL	UNITEL
SEZ	633	1	SEYCEL	633-01
SEZ	633	10	SEZ AIRTEL	AIRTEL
SUD	634	1	MobiTel SDN	MobiTel
RWA	635	10	R-CELL	RCELL
ETH	636	1	ETH-MTN	ET-MTN
SOM	637	1	SOMTELESOM	TELESOM
SOM	637	82	Telsom Mobile	telsom
DJI	638	1	DJ EVATIS	EVATIS
KEN	639	2	Safaricom	SAF-COM
KEN	639	3	YES!	YES!
TZA–640	2	–	MOBITEL - TZ	MOBITEL
TZA	640	3	ZANTEL-TZ	ZANTEL
TZA	640	4	VodaCom	VodaCom
TZA	640	5	celtel	celtel
UGA	641	1	UG CelTel	CELTEL
UGA	641	10	MTN-UGANDA	MTN-UG
UGA	641	11	mango	mango
BDI	642	1	Spacetel BI	SPACETEL
BDI	642	2	BUSAFA	SAFARIS
–MOZ	643	1	MOZ - mCel	mCel
MOZ	643	4	VodaCom-MZ	VodaCom
ZMB	645	1	ZM CELTEL	CELTEL
ZMB	645	2	TELECEL ZM	TELECEL
MDG	646	1	MG Madacom	Madacom
MDG	646	2	MG ANTARIS	ANTARIS
REU	647	0	Orange re	Orange
REU	647	2	F-OMT	OMT
FRA	647	10	SFR REUNION	SFR RU
ZWE	648	1	ZW NET*ONE	NETONE
ZWE	648	3	TELECEL ZW	TELECEL
ZWE	648	4	ZW ECONET	ECONET
NAM	649	1	MTC NAMIBIA	MTCNAM
MWI	650	1	MW CP 900	CP 900

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
MWI	650	10	CELTEL MW	CELTEL
LSO	651	1	VCL COMMS	VCLCOM
LSO	651	2	LS-ECONET-EZI-CEL	EZI-CEL
BWA	652	1	BW MASCOM	MASCOM
BWA	652	2	Orange	Orange
SWZ	653	10	Swazi-MTN	SwaziMTN
COM	654	1	HURI	HURI
ZAF	655	1	VodaCom-SA	VODA
ZAF	655	7	Cell C	Cell C
ZAF	655	10	MTN-SA	MTN
BLZ	702	67	BTL	BTL
BLZ	702	68	INTELCO	INTELCO
GTM	704	2	Comcel_GSM	COMCEL
GTM	704	3	MoviStar	MoviStar
ESV	706	1	ESV PERSONAL	PERSONAL
SLV	706	2	Digicel	DIGICEL
SLV	706	3	TELEMOVIL	TM
SLV	706	4	MoviStar	MoviStar
ESV	706	10	ESV PERSONAL	PERSONAL
HND	708	1	MEGATEL	HNDMGT
HND	708	2	CELTELHND	CELTEL
NIC	710	21	ENITEL	ENITEL
NIC	710	73	SERCOM	SERCOM
CRI	712	1	I.C.E.	I.C.E.
PAN	714	1	PANCW	PANCW
PE	716	10	TIM PERU	TIM
ARG	722	7	UNIFON	UNIFON
ARG	722	34	PERSONAL	AR TP
ARG	722	35	PORT-HABLE	P-HABLE
ARG	722	310	ARG CTI Movil	CTIMovil
BRA	724	2	TIM BRASIL	TIM
BRA	724	3	TIM BRASIL	TIM
BRA	724	4	TIM BRASIL	TIM
BRA	724	5	Claro	Claro
BRA	724	15	BRA SCTL	SCTL
BRA	724	16	BRA BrTCelular	BrTCel

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
BRA	724	31	Oi	Oi
CHL	730	1	ENTEL PCS	ENTEL PCS
CHL	730	2	TELEFONICA	TMOVIL
CHL	730	10	ENTEL PCS	ENTEL PCS
COL	73–	101	COLOMBIA - COMCEL S.A	COMCEL
COL	732	111	COL MOVIL	COL MOVIL
VEN	734	1	VZ INFO	INFONT
VEN	734	2	DIGITEL TIM	DIGITEL
BOL	736	1	NUEVATEL	VIVA
BOL	736	2	EMOVIL	BOMOV
GUY	738	1	GUY TW	TWTGUY
ECU	740	1	PORTA GSM	PORTAGSM
PGY	744	1	HOLA PARAGUAY	VOX
PGY	744	2	PGY Porthable	Porth
PRY	744	4	Telecel GSM	Telecel
SUR	746	2	SR.TELESUR.GSM	TeleG
	901	5	Thuraya	Thuraya

CPHS Information field

CPHS Information

Data field	Bit Field	Meaning
0	None	All information
1	0	CSP service activated and allocated
2	1	SST service activated and allocated
3	2	Mailbox Number service activated and allocated
4	3	Operator Name Shortform service activated and allocated
5	4	Information Numbers service activated and allocated
6	5	RFU
7	6	RFU
8	7	RFU
9	8	Voice Message Waiting indicator for Line 1
10	9	Voice Message Waiting indicator for Line 2
11	10	Data Message Waiting indicator
12	11	Fax Message Waiting indicator
13	12	Call Forward Activated indicator for Line 1
14	13	Call Forward Activated indicator for Line 2
15	14	Call Forward Activated indicator for Data
16	15	Call Forward Activated indicator for Fax
17	16	Reserved
18	17	Reserved
19	18	Reserved
20	19	Reserved
21	20	Line 1 Mailbox Number available
22	21	Line 2 Mailbox Number available
23	22	Data Mailbox Number available
24	23	Fax Mailbox Number available
25	24	EF Mn Updateable

* These status bits contain the V24 control information:

- SA contains DTR (signal CT108 – from terminal to IWF) and DSR (signal CT107 – from terminal to IWF).
- SB contains RTS (signal CT105 – from terminal to IWF) and DCD (signal CT109 – from IWF to terminal).
- X contains CTS (signal CT106).

For more information, refer to GSM 07.02

CSP constants

Service Group: Call Offering

Service	External value
Call Forwarding Unconditional	1
Call Forwarding On User Busy	2
Call Forwarding on No Reply	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 Incoming Calls when Roaming Outside the Home PLMN country	12
BIC roam	13

Service Group: Other Supplementary Services

Service	External value
Multi-Party Service	17
Closed User Group	18
Advice Of Charge	19
Preferential 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 signaling	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: CPHS Features

Service	External value
Reserved: SST in phase 1 CPHS	49

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 - defa–ult block CLI - menu to send CLI	63
CCLI –per call mode - def–ault send 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
ASCI Voice Group call menus	67
ASCI Voice Broadcast service menus	68
Multi Subscriber profile menus	69
Multiple 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 menu options for manual PLMN selection	73
Restriction of menu options for Voice Mail or other similar menus	74
Restriction of menu options for the ability to send Short messages with type Paging	75
Restriction of menu options for the ability to send Short messages with type Email	76
Restriction of menu options for Fax calls	77
Restriction of menu 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

NOTE:

External values not used in these tables are reserved for further use.

Examples

This chapter gives illustrative examples of the general AT commands used for a communication. The presentation of commands and responses is as close as possible to what a user can see on its test monitor. Blank lines have been intentionally removed. The characters on the left margin are DTE generated. Middle column characters are modem generated.

Examples with the PIN required

Example 1, When the ME has to be powered ON.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the report mobile equipment errors
AT+CREG=1	OK	Report registration
AT+CPAS	+CPAS: 5 OK	Query ME Status (ME is asleep)
AT+CFUN=1	OK	Set ME to full functionality
AT+COPS=0	+CME ERROR: 11	Ask for automatic operator selection and registration, SIM PIN required
AT+CPIN=1234	+CME ERROR: 16	User entered a wrong PIN , Incorrect password)
AT+CPIN=0000	OK	PIN Ok
AT+COPS=0	OK	Ask for automatic operator selection and registration.
	+CREG:1	Registered on the network
AT+COPS=3,0	OK	Select the long name alphanumeric format.
AT+COPS?	+COPS: 0,0,"I OMNITEL"	
OK	Get the operator name	

Example 2, When the ME has already been powered on.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the report mobile equipment errors
AT+CPAS	+CPAS: 0 OK	Get the ME Status , ME is ready to receive commands
AT+CPIN?	+CPIN: SIM PIN	Is ME requiring a password? Yes, SIM PIN required
AT+CPIN=0000	OK	PIN Ok

Examples where a voice call is originated

Example 1, When the ME is powered on and the SIM PIN has been entered.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the reporting of mobile equipment errors
AT+WIND=63	OK	Ask to display the general indications.
AT+CPIN?	+CPIN: READY	Is ME requiring a password? No, product is ready
ATD0607103543;	+WIND: 5,1 +WIND: 2 OK	Make a voice call Remote party is ringing. Indication of call Call setup was successful
		Conversation...
ATH	OK	Release the call

Example 2, When a voice call is attempted from a phonebook:

Command example	Possible responses	Note
ATD>"John Pamborn";	+CME ERROR: 22	The "John Pamborn" entry is not found
ATD>"Joel Guerry";	+WIND: 5,1 +WIND: 2 OK	Indication of outgoing call. Remote party is ringing Call setup was successful
		Conversation...
ATH	OK	Release the call

Example with incoming calls

Example 1, When the ME is powered on and the SIM PIN has been entered.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the report mobile equipment errors
AT+WIND=63	OK	Ask to display the general indications.
AT+CLIP=1	OK	Enable the calling line identification presentation.
AT+CRC=1	OK	Enable extended format of incoming indication.
AT+CNUM	+CNUM: “Speech”,” +33608971019”,145 OK	Query own number (voice number) or MSISDN.
		Call this number from another equipment
	+WIND: 5, 1 +CRING:“ VOICE +CLIP:” "+33607”103543",145,,”, "John Panborn" +CRING:VOICE	Indication of call (Ring) Type of call is VOICE. Identification of the remote party.
ATA	OK	Answer the call
		...Conversation...
	NO CARRIER	The call has been released by the remote party.
	+WIND: 6,1	Indication of call release.

Example of a call forwarding

Example 1, When the ME is powered on and the SIM PIN has been entered.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the report mobile equipment errors
AT+CCFC=1,3,"0607492638"	OK	Register to a call forwarding when ME is busy
AT+CCFC=2,3,"014 9293031",129	+CME ERROR: 30	Register to a call forwarding when it does answer, No network service
AT+CCFC=1,2	+CCFC: 1,1,"+33607492638",145	Interrogate, Call forwarding active for a voice call.
AT+CCFC=1,4	OK	Delete call forwarding ME busy

Example of a multiparty call

Example 1, When the ME is powered on and the SIM PIN has been entered.

Command example	Possible responses	Note
AT+CMEE=1	OK	Enable the report mobile equipment errors
AT+WIND=63	OK	Ask to display the general indications
AT+CCWA=1,1	OK	Enable call waiting.
ATD>"John Panborn";	+WIND: 5,1 +WIND: 2 OK	Indication of call Remote party is ringing Call setup was successful
		...Conversation (call1)...
	+WIND: 5,2	Indication of another call.
	+CCWA: "+33595984834", 145,"Dolores Claiborne"	Another call is waiting
AT+CHLD=2	OK	Put first call on hold and answer the second one.
		...Conversation (call2)...
AT+CHLD=3	OK	Every call is part of a multiparty conversation.
AT+CHLD=11	OK	Release the first call (with John Panborn) and recover the second call (with Dolores Claiborne)
		...Conversation (call2)...
ATH	OK	Release the second call.

Examples about phonebooks

For each example illustrated in this section: at the beginning the ME is powered on and the SIM PIN has been entered.

Example 1: The whole phonebook of the ME is read

Command example	Possible responses	Note
AT+CPBS=?	+CPBS: (“SM”,”FD”,”ON”)	Query supported phonebook memories, ADN, FDN, and MSISDN phonebooks supported.
AT+CPBS=”SM”	OK	Select ADN phonebook.
AT+CPBR=?	+CPBR: (1-80),20,14 OK	Read the index range and the length of the elements. 80 locations (from 1 to 80), max length of 20 for the phone number, 14 characters max for the text.
AT+CPBR=1,80	+CPBR: 1,“0346572834”, 129,”Dolores Claiborne” +CPBR: 2,”1284374523”,129, ”Thad Beaumont” +CPBR: 3,“1243657845”, 129,”John Panborn” OK	Read all entries (only the set ones are returned).

Example 2: Erase or Write a phonebook entry

Command example	Possible responses	Note
AT+CPBW=?	+CPBW: (1-80),20,(129,145),14	Get the phonebook type. 80 locations, max length of 20 for the phone number, TON/NPI of 129 or 145 and 14 characters max for the text.
AT+CPBW=3	OK	Erase location 3
AT+CPBW=3,”4356729012”,129,”Carry”	OK	Write at location 3.
AT+CPBR=1,80	+CPBR:1,“0346572834”,129, ”Dolores Claiborne” +CPBR:2,”1284374523”,129, ”Thad Beaumont” +CPBR: 3,”4356729012”, 129,”Carry” OK	Read all entries (only the ones set are returned).

Example 3: Find phonebook entries

Command example	Possible responses	Note
AT+CPBF=?	+CPBF: 20,14	Get the phonebook type. Max length of 20 for the phone number, 10 characters for the text.
AT+CPBF="D"	+CPBF: 1,"0346572834", 129,"Dolores Clairborne" OK	Read entries starting with "D
AT+CPBF="W"	+CME ERROR: 22	Read entries with "W".

Example 4: Phonebook and custom character set

The Custom To Extended GSM conversion table and the Extended GSM To Custom conversion table can be used to display the extended GSM characters:

| ^ € { } [ ] ~ \

To manage one of these extended characters, the character 0x1B must be set in the right place (in the position corresponding to the value of the ASCII code) in the Custom to GSM conversion table (instead of 0x20 (space ASCII code)).

For example, the ASCII code of \ (backslash) is 0x5C, the character 0x1B must be set at the position 0x5C of the Custom to GSM conversion table. The range of character 0x5C in this table is 92. So to update the table the command AT+WCCS=1,0,92 will be used.

In the other way, write the space ASCII code 0x20 in the right place in the Custom to GSM conversion table if an extended character is not needed.

Command example	Possible responses	Note
AT+CPBS?	+CPBS: 3,80	
OK	Query the current phonebook ,	
ADN selected, 3 entries stored		
AT+WPCS?	+WPCS: “TRANSPARENT”	
OK	Query the current phonebook char set	
Transparent mode selected		
AT+CPBR=1	+CPBR: 1,”0146290800”,129,”S bastien”	
OK	GSM character “é” is not displayed	
AT+WCCS=1,0,0,255 >20202020202020202020 A20200D20202020202020 5F2020202020202020202 0202122230225262728292 A2B2C2D2E2F303132333 435363738393A3B3C3D3 E3F004142434445464748 494A4B4C4D4E4F505152 535455565758595A202020 2011206162636465666768 696A6B6C6D6E6F7071727 37475767778797A2020202 020202020202020202020202 020202020202020727202 020202020202020202020202 0204020012403205F20202 020202D202020202020272 020202020202020202020604 14141415B0E1C09451F454 549494949445D4F4F4F4F5 C200B5555555E59201E7F6 161617B0F1D63040565650 7696969207D086F6F6F7C2 00C0675757E792079	OK	

Command example	Possible responses	Note
AT+WCCS=1,1,0,127 >40A324A5E8E9F9ECF 2C70AD8F80DC5E520 5F20202020202020202 020C6E6DFC9202122 23A425262728292A2 B2C2D2E2F30313233 3435363738393A3B3 C3D3E3FA14142434 445464748494A4B4 C4D4E4F505152535 455565758595AC4D 6D1DCA7BF616263 6465666768696A6B 6C6D6E6F70717273 7475767778797AE4 F6F1FCE0	OK	Set the custom character set tables to enable a GSM to default font conversion
AT+WPCS="CUSTOM"	OK	Use the custom character set
AT+CPBR=1	+CPBR: 1,"0146290800 ",129,"Sébastien" OK	GSM character "é" is correctly displayed

Example 5: Use the extended phonebook

Command example	Possible responses	Note
AT+WCOS?	+WCOS: 0	
OK	Phonebook not extended	
AT+CPBS?	+CPBS: "SM",10,20	
OK	Selected phonebook: ADN	
AT+CPBW=1,"0123 456",,"test"	OK	Write an entry in SIM
AT+CPBR=1	+CPBR: 1,"0123456" ,129,"test" OK	Read an entry in SIM
AT+CPBW=1,"0123 456",,"test",1	+CME ERROR: 3	+WCOS=0; you can't write a phonebook group
AT+WCOS=1 SIM	OK	Phonebook extended in
AT+CPBW=1,"0123 456",,"test",1	OK	Write an entry in SIM

Command example	Possible responses	Note
AT+CPBR=1	+CPBR: 1, ”0123456” , 129, ”test”, 1 OK	Read an entry in SIM (extended)
AT+WCOS=0	OK	
AT+WCOS?	+WCOS: 0 OK	Phonebook not extended
AT+CPBR=1	+CPBR: 1,”0123456” ,129,”test” OK	Read an entry in SIM (not extended)
AT+CPBS=”ME”	OK	Selected phonebook: ME (Flash)
AT+WCOS=1	OK	Phonebook extended
AT+CPBW=1, ”+33129 0909”, 145, ”Fred”, ”014 1284549”, 129, ”060000 3210”, 129, ”01412800 00”, 129, ”0198765432 10”, 129, “fred@mywebaddress.com”, “Becker Street London”,1	OK	Write an entry in Flash
AT+CPBR=1	+CPBR: 1, ”+331290909” , 145,”Fred”, ”0141284549” , 129, ”0600003210”, 129, ”0141280000”, 129, ”01987 6543210”, 129, “fred@mywebaddress.com”, “Becker Street London”,1 OK	
AT+WCOS=0	OK	
AT+CPBR=1	+CPBR: 13,”+331290909” ,145,”Fred” OK	Read an entry in Flash (not extended)

To use the extended ME phonebook, you must do:

- AT+CPBS=”ME”
- AT+WCOS=1

To use the extended ADN phonebook, you must do:

- AT+CPBS=”SM”
- AT+WCOS=1

To use the not extended phonebook, you must do:

- AT+WCOS=0

Example 6: Phonebook and custom character set

Command example	Possible responses	Note
AT+CPBS?	+CPBS: 3,80 OK	Query the current phonebook ADN selected, 3 entries stored
AT+WPCS?	+WPCS: "TRANSPARENT" OK	Transparent mode selected
AT+CPBW=1,"01462 90800",129,"test of { }"	OK	
AT+CPBR=1	+CPBR: 1,"01462908 00",129," test of " OK	GSM characters "{"and "}" are not displayed
AT+WCCS=1,0,0, 255<CR> >2020202020202020 20200A20200D20202 0202020205F2020202 020202020202021 22230225262728292 A2B2C2D2E2F3031 32333435363738393 A3B3C3D3E3F0041 4243444546474849 4A4B4C4D4E4F505 1525354555657585 95A1B1B1B1B112061 62636465666768696 A6B6C6D6E6F70717 2737475767778797A 1B1B1B1B201B20202 020202020202020202 020202020272720202 020202020202020202 020204020012403205 F20202020202D2020 202020202720202020 202020202020604141 41415B0E1C09451F45 4549494949445D4F4F 4F4F5C200B5555555E 59201E7F6161617B0F 1D6304056565076969 69207D086F6F6F7C20 0C0675757E792079 <CTRL-Z>	OK	

Command example	Possible responses	Note
AT+WCCS=1,1,0,127<CR> >40A324A5E8E9F9ECF2 C70AD8F80DC5E5205F 20202020202020202020 C6E6DFC920212223A4 25262728292A2B2C2D 2E2F3031323334353637 38393A3B3C3D3E3FA1 4142434445464748494 A4B4C4D4E4F5051525 35455565758595AC4D 6D1DCA7BF616263646 5666768696A6B6C6D6 E6F7071727374757677 78797AE4F6F1FCE0 <CTRL-Z>	OK	Set the custom character set tables to enable a GSM to default font conversion
AT+WPCS="CUSTOM"	OK	Use the custom character set
AT+CPBR=1	+CPBR: 1,"0146290800", 129," test of { }" OK	GSM characters "{" and "}" are correctly displayed

Example 7: MT Phonebook (read only)

Command example	Possible responses	Note
AT+CPBS=”MT”	OK	Select MT phonebook
AT+WCOS=1	OK	Select extended entries
AT+CPBF=””	+CPBF: 1,“0987654321”, 129,” Carry”,0 +CPBF: 2;”9876543210”, 129,”John”,0 +CPBF: 31,”0346572834”, 129,”Dolores Claiborne”,”98765432 10”,129,””,,””,,”65478 91230”,129, ”dolores@mywebaddress.com” ,” Becker Street London”,0 +CPBF: 32, ”6547892012”, 129, ”Pierre”, ””, ,””,,”987 4521021”,129,””,, ,”Pierre@mywebaddress.com”, ””,0 OK	Read all entries
AT+WCOS=0	OK	Select extended entries: not extended
AT+CPBF=””	+CPBF: 1,“0987654321”, 129,” Carry” +CPBF: 2;”9876543210”, 1 29,”John” +CPBF: 31,”03465728 34”,129,”Dolores C laiborne” +CPBF: 32,”6547892012”, 129,”Pierre” OK	Read all entries

NOTE:

Index: 1 and 2 → SM phonebook entries

Index: 31 and 32 → ME phonebook entries

Examples about short messages

Example 1: Send a short message

Command example	Possible responses	Note
AT+CNMI=0,1,1,1,0	OK	SMS-DELIVERs are directly stored, SMS-STATUS REPORTs are displayed
AT+CSMP=17,169,0,0	OK	SMS-SUBMIT message with a validity period (one day)
AT+CMGF=1	OK	Text mode to send a Short Message
AT+CSCA=”+33608080706”	OK	Set Service Center Address to +33608080706
AT+CMGS=0601290800		Send a SMS-SUBMIT to mobile phone
	0x0D 0x0A 0x3E 0x20	Product sends a 4 characters sequence:
This is the first text line<CR>		Edit first line and press carriage return (0x0D)
This is the last text line<ctrl-Z>		Edit last line and send message by pressing <ctrl-Z>(0x1A)
	+CMGS: 5	Success: message reference 5 is returned from the SMS Service Center
	+CDS: 2,5,”0601290800”, 129,”99/05/01 14:15:10+04”	Success: report of successful message delivery received

Example 2: Read short messages

Command example	Possible responses	Note
AT+CMGF=1	OK	Text mode to read Short Messages
AT+CMGL="ALL"	+CMGL: 1,"REC READ"," +336290918",,"99/05/01 14:15:10+04" I will be late +CMGL: 2,"REC UNREAD"," +336290918",,"99/05/01 14:19:44+04" Traffic jam on Broadway OK	List all stored messages This is the first message This is the second message
AT+CMGR=1	+CMGR: "REC READ"," +336290918",,"99/05/01 14:19:44+04" "I will be late" OK	Read the first message

Examples about Fax class 2

Example 1: Send a fax class 2

Command example	Possible responses	Note
AT+FCLASS=2	OK	Select fax cla"ss 2
AT+"FLID="LocalFax"	OK	Call establishment
ATD0601234567	+"FCON [+FC"SI: "RemoteFax"] +FDIS:0,3,0,2,0,0,0,0 OK	Connection OK
AT+FDT	+FDCS:0,3,0,2,0,0,0,0 CONNECT <0x11h> ... OK	Beginning of the data transfer Send carrier First page data terminated by <0x10h><0x03h> Page transmitted
AT+FET=0	+FPTS:1 OK	Send another page First page acquitted
AT+FDT	CONNECT <0x11h> ... OK	Send carrier Second page data terminated by <0x10h><0x03h> Page transmitted

Command example	Possible responses	Note
AT+FET=2	+FPTS:1 +FHNG:0 OK	No more page First page acknowledged Normal end of connection

Example 2: Receive a fax class 2

Command example	Possible responses	Note
AT+FCR=1”	OK	
AT+FLID="LocalFax"	OK	
	RING	Incoming call
ATA	“+FCON [+FT”SI: "RemoteFax"] +FDCS:0,3,0,2,0,0,0,0 OK	Answer Connection OK
AT+FDR	+FCFR +FDCS:0,3,0,2,0,0,0,0 CONNECT <0x12h> <0x10h><0x03h> OK	Receive page carrier First page data terminated by<0x10h><0x03h> Page received
	+FPTS:1	First page acknowledged
	+FET:0 OK	To receive another page
AT+FDR	+FDCS:0,3,0,2,0,0,0,0 CONNECT <0x12h>	Receive page carrier
	<0x10h><0x03h> OK	Second page data terminated by<0x10h><0x03h> Page received
	+FPTS:1	Second page acknowledged
	+FET:2 OK	No more page to receive
AT+FDR	+FHNG:0 OK	Normal end of connection

+CSIM and +CRSM Examples

NOTE:

If SIM answer is not specified in the following examples, it will mean that the answer will depend on the SIM content.

DF GSM SELECTION AND THEN STATUS

Command example	Possible responses	No”e
AT+CSIM=14,"”A0A400 002”7F20"”	+CSIM=4,"9F16"	Selection
AT+CSIM=”10,"A0F20 00”01”6"	+CSIM=48,"..."	Status

DF TELECOM SELECTION AND THEN STATUS

Command example	Possible responses	No”e
AT+CSIM=14,”A0A400000” 7F10”	+CSIM=4,"9F16"	selecti”n
AT+CSIM”10,"A0F200”0”6"	+CSIM=48,"⁞⁞"	status

EF ADN SELECTION AND THEN STATUS

DF Telecom selection is mandatory just before the following AT commands.

Command example	Possible responses	No”e
AT+CSIM=14,”A0A400000” 6F3A”	+CSIM=4,"9F0F"	selecti”n
AT+CSIM”10,"A0C000”0”F"	+CSIM=34,". . ."	status

STATUS COMMANDS

Command example	Possible responses	Note
AT+CRSM=242	SIM dependant	Status – No File Id – without P1,P2, P3
AT+CRSM=242,28474	SIM dependant	Status – 6F3A (EF ADN) – without P1, P2, P3
AT+CRSM=242,28423	SIM dependant	Status – 6F07 (EF IMSI) – without P1, P2, P3
AT+CRSM=242,16128	SIM dependant	Status – 3F00 (MF) – without P1, P2, P3
AT+CRSM=242,32528	SIM dependant	Status – 7F10 (DF Telecom) – without P1, P2, P3
AT+CRSM=242,32544	SIM dependant	Status – 7F20 (DF GSM) – without P1, P2, P3

GET RESPONSE COMMANDS

Command example	Possible responses	Note
AT+CRSM=192,28474	–	Get Response – (EF ADN) – without P1, P2, P3
AT+CRSM=192, 28423	–	Get Response – (EF IMSI) – without P1, P2, P3
AT+CRSM=192,16128	–	Get Response – (MF) – without P1, P2, P3
AT+CRSM=192,32528	–	Get Response – (DF Telecom) – without P1, P2, P3
AT+CRSM=192,32544	–	Get Response – (DF GSM) – without P1, P2, P3
AT+CRSM=192, 28423,0,0,15		Get Response – 6F07 (EF IMSI)

READ RECORD COMMANDS

Command example	Possible responses	Note
AT+CRSM=178,28474,1,4,28		Read Record – EF ADN (Pin Code validated)

Technical appendixes

Data / Commands multiplexing protocol

Introduction:

The multiplexing protocol operates between a DCE (Data Communication Equipment: the product) and a DTE (Data Terminal Equipment). It allows a double session over a serial link interface: one for AT commands and one for DATA communications.

AT+WMUX=1 activates the Multiplexing Mode. With this mode, AT commands and DATA are encapsulated into packets. The header of these packets allows to recognize whether it is a DATA packet or an AT command packet. AT+WMUX=0 deactivates the Multiplexing Mode and gets the product back to the default mode.

This appendix presents how the multiplexing mode handles the DATA and the AT commands flow. It also describes the format of DATA packets and AT command packets.

AT command packets:

An AT command is encapsulated into a packet with a header which allows to separate it from DATA packets. This packet is formed by a header (3 bytes), the AT command itself and a checksum (1 byte):

B7	B6	B5	B4	B3	B2	B1	B0
Start pattern → 0xAA							
AT command length LSB							
AT command pattern → 0x1D					AT command length MSB		
AT command							
Checksum							

The 3 bytes of the header are:

- The first byte (0xAA) is used to identify the packet.
- The second byte represents the 8 LSB (Low Significant Bits) bits of the length of the AT command.
- The third byte is made of 2 parts:
  - The 3 LSB bits are the 3 MSB (Most Significant Bits) bits of the length of the AT command.
  - The 5 MSB bits (0x1D which equals to 0xE8 with the 3 bits offset) are used to identify an AT command.

The maximum length of an AT command could be 2047 bytes which is greater than all the existing AT commands.

The checksum is the addition (modulo 256) of all the transmitted bytes (header bytes and AT command bytes).

Data packets:

Like for AT commands, DATA are encapsulated into packets. These packets are composed of a header (3 bytes), the data bytes and the checksum (1 byte):

B7	B6	B5	B4	B3	B2	B1	B0
Start pattern → 0xDD							
Data packet length LSB							
Data packet type					Data packet length MSB		
Data Bytes							
Checksum							

The 3 bytes of the header are:

- The first byte (0xDD) used to identify the packet.
- The second byte represents the 8 LSB bits of the length of the data field.
- The last byte is made of 2 parts:
  - The 3 LSB bits represent the 3 MSB bits of the length of the data field.
  - The 5 MSB bits represent the packet type.

Data packets can have different values according to the type of packet:

0: DATA packet: the packet contains the data to transmit on the radio link or received from the radio link.

1: STATUS packet: the packet contains the status of SA, SB, X bits* and the break condition coding as follow:

SA	SB	X	BRK	RI	Spare	Spare	Spare

  - The length of data for the status packet is always equal to 1.
  - Whenever a status changes (except break), all the status bits are included.
  - These bits are off by default (and therefore the bits DTR and RTS), so it is necessary to send a status packet to the target at the beginning of the multiplexing to start the transmission.

2: READY packet: the packet indicates that the target is ready to receive data:
  - No data are transmitted in this packet (so the length is null).

3: BUSY packet: the packet indicates that the target is busy and can not receive data:
  - Like the ready packet, no data are transmitted.

Other values: currently, these values are not used (reserved for future enhancement).

NOTE:

The checksum is calculated like the AT command packet checksum (addition of all the transmitted bytes including the header bytes).

Example: AT command and its answer

Standard AT command:

Command example	Possible responses	Note
AT\r\n		When there is no encapsulation the AT command transmitted on the serial link is like this (in ASCII and hexadecimal): (0x41 0x54 0x0D 0x0A)
	\r\nOK\r\n	and the answer is like this: (0x0D 0x0A 0x4F 0x4B 0x0D 0x0A)

Command with the protocol:

Command example	Possible responses	Note
0xAA 0x04 0xE8 0x41 0x54 0x0D 0x0A 0x42		With the encapsulation in the serial link, the packet transmitted is (in hexadecimal):
	0xAA 0x06 0xE8 0x0D 0x0A 0x4F 0x4B 0x0D 0x0A 0x60	and the answer is like this:

Example: Initialization and Data packet

When the Multiplexing Mode is activated (+WMUX=1), the product sends 2 Data packets after the establishment of a DATA call (after the CONNECT xxxx message):
1 READY Packet and 1 STATUS Packet. To set the different signals to the right value, it is necessary to send a STATUS packet to the product.

Command example	Possible responses	Note
0xDD 0x01 0x08 0x40 0x26		bit RTS is on
0xDD 0x01 0x08 0xC0 0xA6		to start a data call, all the bits should be on: bits DTR and RTS are on

NOTE:

The autobauding mode is not available when the Multiplexing Mode is activated: the serial link speed must be set to a fixed rate.

Support of SIM ToolKit by the ME

This has been extracted from the GSM 11.14.

Support of SIM Toolkit classes

	Classes		
Command description	**1**	**2**	**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

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 termina-ted by the user (99)		•	•	•	•	•	•					

Structure of TERMINAL PROFILE

First byte (Download):

b8	b7	b6	b5	b4	b3	b2	b1		
								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):

b8	b7	b6	b5	b4	b3	b2	b1		
								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	**User choice**
								UCS2 Entry supported	**User choice**
								UCS2 Display supported	**User choice**
								Display of the extension text	**User choice**

Third byte (Proactive SIM):

b8	b7	b6	b5	b4	b3	b2	b1		
								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):

b8	b7	b6	b5	b4	b3	b2	b1		
								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):

b8	b7	b6	b5	b4	b3	b2	b1		
								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	**User choice**
								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):

b8	b7	b6	b5	b4	b3	b2	b1		
								RFU, bit = 0	

Seventh byte (Multiple card proactive comman“ds”) for class "a"

b8	b7	b6	b5	b4	b3	b2	b1		
								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):

b8	b7	b6	b5	b4	b3	b2	b1		
								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	**Set by product to 0**

Nine byte:

b8	b7	b6	b5	b4	b3	b2	b1		
								Sustained DISPLAY TEXT	**Set by product to 0**
								SEND DTMF command	**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:

b8	b7	b6	b5	b4	b3	b2	b1		
								RFU, bit = 0	

Information about BCCH channel list

This is an extract from GSM 11.14

Byte(s)	Description	Length
1	BCCH channel list tag	1
2	Length (X) of bytes following	1
3 to X+2	BCCH channel list	X

BCCH channel list

Contents: the list of absolute RF channels for BCCH carriers, as known by the ME from the SYSTEM INFORMATION messages. The BCCH channel list is composed of one to three BCCH channel sub lists, each sub list is derived from the set of frequencies defined by reference neighbor cells description information element or elements. In the latter case the set is the union of the different subsets defined by the neighbor cells description information elements. The length of the BCCH channel list field depends on the length of the received BCCH channel list derived from the different SYSTEM INFORMATION messages to be considered.

Coding: Each ARFCN (Absolute Radio Frequency Channel Number) is represented by 10 bits. Spare bit(s) are to be filled with 0.

	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1
Byte 1	ARFCN#1 (high part)							
Byte 2	ARFCN#1 (low part)		ARFCN#2 (high part)					
Byte 3	ARFCN#2 (low part)				ARFCN#3 (high part)			
...	...							
Byte X-1	ARFCN#m-1 (low part)				ARFCN#m (high part)			
Byte X	ARFCN#m (low part)						Spare bit (0)	Spare bit (0)

SIM applications should take into account that early implementations of SIM application toolkit may have coded this field differently, because of an inconsistency between the content and the coding of this element in previous versions of 11.14. The SIM is able to identify MEs that are using the coding described above by evaluating t“he indication "BCCH Chann”el List coding" in the TERMINAL PROFILE command.

Command Type and Next Action Indicator.

This table has been extracted from the GSM 11.14.

Value	Name	Used for Type of Command coding	used for Next Action Indicator coding
‘'00'		-	-
'0‘'	’EFRESH	X	
'02'	‘MO’E TIME	X	
'03'	POL‘ I’TERVAL	X	
'04'	P‘LL’NG OFF	X	
'05'	SET UP ‘VE’T LIST	X	
'10'	SE‘ U’ CALL	X	X
'11‘	S’ND SS	X	X
'12'	‘EN’ USSD	X	X
'13'	SEND SHOR‘ M’SSAGE	X	X
'14'‘	SE’D DTMF	X	
'20'	‘LA’ TONE	X	X
'21'	DIS‘LA’ TEXT	X	X
'22'	‘ET’INKEY	X	X
'23'	‘ET’INPUT	X	X
'24'	SE‘EC’ ITEM	X	X
'25'	SE‘ U’ MENU	X	X
'26'	PROVIDE LOCAL I‘FO’MATION	X	
'27'	TIMER ‘AN’GEMENT	X	
'28'	SET UP IDLE M‘DE’ TEXT	X	X
'30'	PERFORM C“R” APDU	class‘"a’ only	X X
'31'	POWER “N”CARD	class‘"a’ only	X X
'32'	POWER O“F”CARD	class‘"a’ only	X X
'33'	GET READER“S”ATUS	class‘"a’ only	X X
'34'	RUN AT“C”MMAND	clas‘ "”" only	X
'81'	End of the proactive session	not applicable	X

Coding of Alpha fields in the SIM for UCS2

The coding can take one of the three following structures, or GSM default alphabet. If the ME supports UCS2 coding of alpha fields in the SIM, it will support all three coding schemes for character sets containing 128 characters or less. For character sets containing more than 128 characters, the ME will at least support the first coding scheme. Within a record, only one coding scheme, either GSM default alphabet, or one of the three described below, can be used.

3) **If the first byte in the al‘pha s’tring is '0x80',** then the other bytes are 16 bit UCS2 characters. The most 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 most 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 sh‘all’ be set to 'FF': if the alpha field has an even length in bytes, the last (unusable) byte w‘ill’ be set to 'FF'.

Example 1

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	‘yt’ 8	Byte 9
'80'	$Ch1_{MSB}$	$Ch1_{LSB}$	$Ch2_{MSB}$	$Ch2_{LSB}$	‘Ch’M‘B	’h3LS	FF'	'FF'

3) **If the first byte of the al‘pha s’tring is '0x81',** then the 2nd byte contains a value indicating the number of characters in the string. The 3rd byte contains an 8 bit number which defines bits 15 to 8 of a 16 bit base pointer, where bit 16, and bits 7 to 1 would be set to zero. These sixteen bits represent a base“ pointer t”o a "half-page" in the UCS2 code space, to be used with some or all of the remaining bytes in the string. The 4th and subsequent bytes in the string contain coding 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, the remaining bits are an offset value to add 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	’yt’	’
’81’	’05’	‘13’	‘53’	‘95’	‘A6’	'28'	'FF'	'FF'

In the example above

- 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 shah h000 0000 as the 16 bit base pointer number. Bengali characters for example start at code position 0980 (0000 1001 1000 0000), which is indicated ‘by ’the coding '13' in byte 3 (shown by the italicized underlined digits).

- Byte 4 indicates GSM Default Alphabet characte“r ”‘53’, e.g.. "S".
- Byte 5 indicates a UCS2 character offset to the ba‘se ’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 100‘1 010’1, e.g.. '0995', which is the Bengali letter KA.
- Byte 8 conta‘ins’ the value 'FF': 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 to a sixteen bit value of 0000 1001 1111 1111 for the UCS2 chara‘cter ’(that is '09FF').
- Byte 9 contains the padding value OxFF.

3) If the first byte of the alpha string is set to 0x82, then the 2nd byte contains the length of the string (number of characters).

The 3rd and 4th bytes contain a 16 bit number which defines the complete 16 bit base“ pointer t”o a "half-page" in the UCS2 code space, for use with some or all of the remaining bytes in the string.

The 5th and subsequent bytes in the string contain coding as follows:

- If bit 8 of the byte is set to zero, the remaining seven bits of the byte contain a GSM Default Alphabet character.
- If bit 8 of the byte is set to one, the remaining seven bits are an offset value added to the base pointer defined in bytes 3 and 4, and the resulting 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	’yt’	’
‘82’	‘05’	‘05’	‘30’	‘2D’	‘82’	'D3'	'2D'	'31'

In the example above:

- Byte 2 indicates there are 5 characters in the string
- Bytes 3 and 4 contain a 16 bit base poin‘ter n’umber of '0530', pointing to the first character of the Armenian character set.
- Byte 5 contains a GSM Default Alphabet‘ ch’aracter of '2D', wh“ic“h is a dash "-".
- Byte 6 con‘tai’ns a value '82', which indicates it is‘ an’ offset of '02' added to the base pointer, resulting in a UCS2 char‘acter’ code of '0532', which represents Armenian character Capital BEN.
- Byte 7 con‘tai’ns 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.

Command execution and dependence to SIM

These arrays list all the AT commands. For each, a column indicates the command execution condition (if +WIND:4 must have occurred OK, for example). SIM dependency column indicates if the command behavior will vary if another card is used (for example, it will be the case for phonebook reading commands). The Intermediate column indicates if intermediate responses can occur for the considered command.

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 previous command	N
AT+CPOF	+WIND: 3 without SIM, +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+CSIM			
AT+CCLK	+WIND: 3	Y	N
AT+CALA	+WIND: 3	N	Y

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

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
AT* WPIN	+WIND:1	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+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: 4	Y	N
AT+CNMA	+WIND: 4	Y	N
AT+CPMS	+WIND: 4	Y	N
AT+CMGF	+WIND: 3	N	N
AT+CSAS	+WIND: 3	Y	N
AT+CRES	+WIND: 3	Y	N
AT+CSDH	+WIND: 4	Y	N
AT+CNMI	+WIND: 4	Y	N
AT+CMGR	+WIND: 4	Y	Y°
AT+CMGL	+WIND: 4	Y	Y
AT+CMGS	+WIND: 4	Y	N°
AT+CMGW	+WIND: 4	Y	Y
AT+CMSS	+WIND: 4	Y	N
AT+CSMP	+WIND: 4	Y	N
AT+CMGD	+WIND: 4	Y	N
AT+CSCA	+WIND: 4	Y	N
AT+CSCB	+WIND: 4	Y	N
AT+WCBM	+WIND: 4	Y	N
AT+WMSC	+WIND: 4	Y	Y

AT commands	Conditions	SIM dependence	Intermediate
AT+WMGO	+WIND: 4	Y	N
AT+WUSS	+WIND: 3	N	N
AT+WMCP	+WIND: 4	Y	N
AT+CMMS	+WIND: 3	Yes	No

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

Fax commands

AT commands	Conditions	SIM dependence	Intermediate
AT+FTM	+WIND: 3	N	N
AT+FRM	+WIND: 3	N	N
AT+FTH	+WIND: 3	N	N
AT+FRH	+WIND: 3	N	N
AT+FTS	+WIND: 3	N	N
AT+FRS	+WIND: 3	N	N

Class 2 Commands

AT commands	Conditions	SIM dependence	Intermediate
AT+FDT	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FDR	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FET	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FPTS	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FK	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FBOR	+WIND: 3	N	N
AT+FBUF	+WIND: 3	N	N
AT+FCQ	+WIND: 3	N	N
AT+FCR	+WIND: 3	N	N
AT+FDIS	+WIND: 3	N	N
AT+FDCC	+WIND: 3	N	N
AT+FLID	+WIND: 3	N	N
AT+FPHCTO	+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+CIND	+WIND: 3	N	N
AT+CMEC	+WIND: 3	N	N
AT+WLPR	+WIND: 1	N	N
AT+WLPW	+WIND: 1	N	N
AT+WAC	+WIND: 3	N	N
AT+WDWL	+WIND: 3	N	N
AT+WDR	+WIND: 3	N	N
AT+WHWV	+WIND: 3	N	N
AT+WDOP	+WIND: 3	N	N
AT+WSTR	+WIND: 3	N	N
AT+WSCAN	+WIND: 3	N	N
AT+WRIM	+WIND: 3	N	N
AT+WSSW	+WIND: 3	N	N

AT commands	Conditions	SIM dependence	Intermediate
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+WMBN	PIN	Y	N
AT+WOPEN	+WIND: 3	N	N
AT+WRST	+WIND: 3	N	N
AT+WLOC	PIN Code	Y	N
AT+WATH	+WIND: 3	N	N
AT+WMBS	+WIND: 3	N	N
AT+WBHV	+WIND: 3	N	N
AT+WNON			N
AT+WCPI		Y	N
AT+WCSP			N
AT+WMSN		N	N

SIM Toolkit commands

AT commands	Conditions	SIM dependence	Intermediate
AT+STSF	+WIND: 3	N	N
AT+STIN	+WIND: 4	Y	N
AT+STGI	+WIND: 4	Y	N
AT+STGR	+WIND: 4	Y	N
AT+STRIL		Y	N
AT+STRC		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

Generic I/O commands

AT commands	Conditions	SIM dependence	Intermediate
AT*WIOD	+WIND: 3	N	N
AT*WIOE	+WIND: 3	N	N
AT+WIOL	+WIND: 3	N	N
AT+WIOT	+WIND: 3	N	N
AT+WIOP	+WIND: 3	N	N
AT+WRAP	+WIND: 3	N	N

TCP socket autoconnect commands

AT commands	Conditions	SIM dependence	Intermediate
AT*WTCPCONNECT	+WIND: 4	Y	N
AT*WGPRSAPN	+WIND: 3	N	N
AT*WGPRSUN	+WIND: 3	N	N
AT* WGPRPW	+WIND: 3	N	N
AT* WTCPSERV	+WIND: 3	N	N
AT* WTCPPORT	+WIND: 3	N	N
AT* WTCPXDELAY	+WIND: 3	N	N

Secure call-back commands

AT commands	Conditions	SIM dependence	Intermediate
AT*WCB	+WIND: 3	N	N
AT*WCBPWD	+WIND: 3	N	N
AT+WCBTAB	+WIND: 3	N	N
AT+WCBTIME	+WIND: 3	N	N

Interoperability

All the commands listed below are only used for interoperability with other applications. They have no action and always reply OK.

Command	Responses
ATB	OK
ATC	OK
ATG	OK
ATL	OK
ATM	OK
ATN	OK
ATP	OK
ATT	OK
ATW	OK
ATX	OK
ATY	OK
AT\K	OK
AT&E	OK
AT&G	OK
AT&K	OK
AT&P	OK
AT&Q	OK
AT&R	OK
AT&Y	OK
AT+GOI	OK
AT+GCI	OK

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