AT commands interface

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7.2	16-10-1997	P	F. Desnoues		Network & SIM lock (+CLCK, +CPWD)
7.3	21-12-1997	P	F. Desnoues		SIM Phonebook management (+CPBS, +CPBR, +CPBF, +CPBW) FAX management document
7.4	10-02-1998	P	F. Desnoues		Advice Of Charge management (+CAOC, +CACM, +CAMM, +CPUC)
7.5	31-03-1998	P	F. Desnoues		ATV and ATQ commands
7.6	30-04-1998	P	F. Desnoues		Cell Broadcast Msg management (+CSCB, +WCBM) and Incoming bearer (+CICB)
7.7	30-06-1998	P	O.Capron		New commands +CPINC,+CCID,+CNUM, +WAIP , +CPBP, +CPBN (phonebook)
7.8	29-10-1998	P	O.Capron		SMS commands (+CMGW, +CMSS)
			F.Desnoues		New formats of Suppl Serv commands (+CLCK,+CCWA,+CCFC)
			R.Dorey		Add comments pertaining to +IPR,+CBST,+ICF and fax setup.
7.9	10-02-1999	P	O.Capron F.Desnoues		New +CPIN2, +CIMI, +WIND, +CPOL, +WOPN (Operator Name), +WLPR, +WLPW, +WIOR, +WIOW (GPIO), AT&T Extension: +CCED (RxLev auto), +CPBS (Own Nb), +CLCK (FDN), ATD (Temporary CLIR)

DOCUMENT AMENDMENTS

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8.0	15-04-1999	P	F.Desnoues	New: +CHLD, +CLCC, +CSSN, +CUSD, +WMGO, +WMSC Extension: ATD, ATH, ATA, +CCWA, +CLIP, +COLP, +WIND, +COPS Modification: +VGR levels
8.1	04-05-1999 16-06-1999	P P	C.Amiens C.Foratier	New format of +ECHO?.command. New: +CCUG, AT&V, ATI, +DOPT Extension: ATD (Temporary CUG) Modification:+CRLP, +ILRR, +FCLASS, add fax class 1 commands,
8.3	21-06-1999 27-09-1999	P P	C. Amiens C.Foratier	New: %D, +VIP, +WAC. New: +WTONE,+WDTMF,+CKPD Extension: "EN" phonebook Extension: ATD (GSM sequences)

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1. Introduction

1.1. Scope of this document

This document describes the messages exchanged between an external application module and the WAVECOM GSM mobile station, based on AT commands in order to control incoming and outgoing calls.

This document presents the AT-commands implemented for the voice call teleservice, the data teleservice and the short message teleservice.

1.2. Related documents

This interface specification is based on the following recommandations :

[1] ETSI GSM 07.05 : Digital cellular telecommunications system (Phase 2) ; Use of DTE-DCE interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)

[2] ETSI GSM 07.07 : Digital cellular telecommunications system (phase 2) ; AT command set for GSM Mobile Equipment (ME)

[3] ITU-T Recommandation V.25 ter : Serial asynchronous automatic dialling and control

[4] ETSI GSM 03.40 : Digital cellular telecommunications system (phase 2) ; Technical realization of the Short Message Service (SMS) Point-to-Point (PP)

[5] ETSI GSM 03.38 : Digital cellular telecommunications system (phase 2) ; Alphabets and language-specific information

[6] ETSI GSM 04.80 : Digital cellular telecommunications system (Phase 2): Mobile radio interface layer 3, Supplementary services specification, Formats and coding

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1.3. ETSI secretariat

The following addresses can be useful to get the latest GSM recommendations.

Postal address :   F-06921 Sophia Antipolis CEDEX - FRANCE

Office address :   650 Route des Lucioles - Sophia Antipolis –

Valbonne - FRANCE

Internet : secretariat@etsi.fr

Tel :   +33 4 92 94 42 00

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1.4. Definitions

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

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2. AT commands features

2.1. Wavecom line settings

Serial link handler is set to default values (factory settings) :

autobaud, 8 bits data, 1 bit stop, no parity, RTS/CTS flow control.

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

2.2. Command line

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

2.3. Information responses and result codes

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

• If the syntax of the command is wrong, the string **ERROR** is sent.

• If the syntax command is correct but with some incorrect parameters, the string **+CME ERROR :** <Err> or **+CMS ERROR :** <SmsErr> is sent with different error codes.

• If the command line has been performed successfully, the string **OK** is sent.

In some cases like "AT+CPIN?", "AT+EXPKEY?", or incoming events (unsolicited) the module does not finish its response with the string **OK**.

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

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3. General behaviors

3.1. SIM Insertion, SIM Removal

The SIM card Insertion and Removal procedures are supported. These are software functions based on the reading of the hardware SIM presence pin. This pin state (open / closed) is watched continuously.

When the SIM presence pin indicates a presence of a card in the SIM connector, the module tries to establish a logical SIM session. Depending if the somewhat is a SIM Card or not, the logical SIM session will be established or not. The AT+CPIN? delivers the following answers :

- If SIM presence pin indicates "Nothing", the answer to AT+CPIN? is "+CME ERROR 10" (SIM not inserted)

- If SIM presence pin indicates "something", and the inserted Card is a SIM Card, the answer to AT+CPIN? is "+CPIN: xxx" depending of the SIM PIN state.

- If SIM presence pin indicates "something', and the inserted Card is not a SIM Card, the answer to AT+CPIN? is CME ERROR 10

- These both last status are not immediately available due to background initialisation. Between the hardware SIM presence pin indication of "something" and the previous results the AT+CPIN? sends "+CME ERROR: 515" (Please wait, init in progress)

When the SIM presence pin indicates an absence, if a SIM Card was inserted before, an IMSI detach procedure is done, and all the user data are removed from the module (Phonebooks, SMS etc.). The module is then in **emergency mode**.

3.2. Backgroung initialisation

After PIN entry, some SIM user data files are loaded in the module (Phonebooks, SMS status …), but it can take a long time for huge phonebooks reading. The AT+CPIN? command answers just after verification of the PIN. User Datas are loaded after the answer in background.

This mean, that some datas may not be available just after the OK from PIN Entry. Reading of phonebooks will then be refused by the following "+CME ERROR: 515" or "+CMS ERROR: 515" meaning "please wait, service is not available, init in progress".

That kind of answer may be sent by the module at several steps :

- When trying to execute another AT command before the end (response) of the previous one.

- when swapping from (or to) ADN to (or from) FDN and trying to read immediately the concerned phonebook ;

- when asking for +CPIN? Status just after a SIM insertion when the module has not determined that the inserted card is a valid SIM Card.

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4.   General commands

4.1.   Manufacturer identification   +CGMI

This command gives the manufacturer identification.

Application to GSM	AT+CGMI	*Get manufacturer identification*
GSM to application	WAVECOM MODEM OK	*Command valid, Wavecom modem*

4.2.   Request model identification   +CGMM

This command is used to get the supported bands (GSM 900, DCS 1800 or PCS 1900). The answer could be a combination of different bands in the case of multiband modules.

Application to GSM	AT+CGMM	*Get hardware version*
GSM to application	900P OK	*GSM 900 MHz primary band, or* "900E " (extended band), "*1800*" (DCS), "1900" *(PCS) or* "MULTIBAND"

4.3.   Request revision identification   +CGMR

This command is used to get the software version.

Application to GSM	AT+CGMR	*get software version*
GSM to application	310_G250.51 806216 032199 17:04 OK	*Software release 3.10 ,révision 51 generated on the 21st of March 1999*

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4.4. Product Serial Number   +CGSN

This command allows the user application to know the IMEI of the GSM module. The application sends :

Application to GSM	AT+CGSN	*Request IMEI*
GSM to application	135790248939 OK	*IMEI present in EEPROM*
Application to GSM	AT+CGSN	*Request IMEI*
GSM to application	+CME ERROR: 22	*IMEI not found in EEPROM*

4.5. Select TE character set   +CSCS

This commands informs the ME which character set is used by the TE. ME is then able to convert each character of entered or displayed string. This is used to send, read or write short messages.

Application to GSM	AT+CSCS="GSM"	*GSM default alphabet*
GSM to application	OK	*Command valid*
Application to GSM	AT+CSCS="PCCP437"	*PC character set Code Page 437*
GSM to application	OK	*Command valid*

4.6. Request IMSI +CIMI

This command is used to read the IMSI (International Mobile Subscriber Identity) of the SIM card. The PIN should be entered if needed before reading the IMSI.

Command syntax: AT+CIMI

Response syntax: <IMSI>

Application to GSM	AT+CIMI	*Read the IMSI*
GSM to application	208200120320598	*IMSI value (15 digits), starting with MCC (3 digits) / MNC (2 digits, 3 for PCS 1900)*

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See appendice 16.12 for MCC / MNC description.

4.7. Card Identification   +CCID

This command instructs the module to read the EF-CCID file on the SIM card.

Command syntax :   AT+CCID

Response syntax :   +CCID : <id>

In case of absent EF-CCID file on the SIM, the +CCID will not be sent. But the OK will be present.

Application to GSM	AT+CCID	*get card id*
GSM to application	+CCID : "123456789AB111213141" OK	*EF-CCID is present, hexadecimal format*
Application to GSM	AT+CCID ?	*get current value*
GSM to application	+CCID : "123456789AB111213141"	*Same result as +CCID*
Application to GSM	AT+CCID= ?	*get possible value*
GSM to application	OK	*no parameter but this command is valid*

4.8. Capabilities list +GCAP

This command gives the complete capabilities list.

Application to GSM	AT+GCAP	*get capabilities list*
GSM to application	+GCAP: +CGSM +FCLASS OK	*supports GSM commands and FAX*

4.9. Repeat last command   A/

Only A/ command can not be repeated. This command repeats the last command executed.

Application to GSM	A/	*Repeat last command*

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4.10. Power off +CPOF

This **specific** command stops the GSM software stack and then the hardware layer. The AT+CFUN=0 command is equivalent to +CPOF

Application to GSM	AT+CPOF	*stop GSM stack*
GSM to application	OK	*Command valid*

4.11. Set phone functionality   +CFUN

This command selects the level of functionality in the mobile station.

•When the application wants to stop the module for making a power off, or if the application wants to force the module for executing a IMSI DETACH procedure, then it has to send :

AT+CFUN=0 (same as AT+CPOF)

This command executes a IMSI DETACH and makes a backup of some internal parameters in the SIM and the EEPROM. Then no access to the SIM card is possible.

If the mobile is not powered off after this command, it shall received another command to re-start the whole GSM process.

If the mobile is turned off after this command, then the power on will automatically execute the start of the whole GSM process.

When the application wants to re-start the module (after having done a AT+CFUN=0 command, and without having cut the power supply), it has to send :

AT+CFUN=1

This command starts again all the GSM stack and GSM functionality, a complete software reset is done. All parameters are reset to their previous E2P value if AT&W was not used.

If you write entries in phonebook (+CPBW) and then reset the module directly (AT+CFUN=1, without any AT+CFUN=0 before), some entries may not be written (SIM task does not have the time to write entries in SIM card)

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Also, the OK response will be sent at the last defined baud rate defined by +IPR command. With autobauding the response can be at a different baud rate, so it is better to save the defined baud rate with AT&W before directly send the AT+CFUN=1 command.

Application to GSM	AT+CFUN?	*Ask for current functionality level*
GSM to application	+CFUN: 1 OK	*Full functionality*
Application to GSM	AT+CFUN=0	*Set minimum functionality, IMSI detach procedure*
GSM to application	OK	*Command valid*
Application to GSM	AT+CFUN=1	*Set the full functionality mode with a complete software reset*
GSM to application	OK	*Command valid*

4.12. Phone activity status +CPAS

This command returns the activity status of the mobile.

Application to GSM	AT+CPAS	*Current activity status*
GSM to application	+CPAS: <pas> OK	*<pas> can have the following values :* *0 : ready (allow commands from TA/TE)* *1 : unavailable (does not allow cmds)* *2 : unknown* *3 : ringing (ringer is active)* *4 : call in progress* *5 : asleep (low functionality)*

4.13. Report Mobile Equipement errors   +CMEE

This command disables or enables the use of result code "+CME ERROR : <xxx>" or "+CMS ERROR :<xxx>" instead of simply "ERROR". See appendice 16.1 for +CME ERROR result codes description and appendice 16.2 for +CMS ERROR result codes.

Application to GSM	AT+CMEE=0	Disable ME error reports, use only « ERROR »
GSM to application	OK	
Application to GSM	AT+CMEE=1	Enable « +CME ERROR : <xxx> » Or « +CMS ERROR : <xxx> »
GSM to application	OK	

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4.14. Keypad control +CKPD

Command syntax: +CKPD=<keys>

 Execution command emulates ME keypad by giving each keystroke as a character in a string <keys>.

The supported GSM sequences are listed in 16.11.

If emulating fails in an ME error, +CME ERROR: <err> is returned.

If emulating succeeds, the result is dependent of the GSM sequence.

<keys>: string of following characters (0-9,*,#)

Application to GSM	AT+CKPD="*#21#"	*Check all call forwarding status*
GSM to application	+CCFC: 0,7	
Application to GSM	AT+CKPD="1234"	*Sequence not allowed*
GSM to application	+CME ERROR 3	

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5. Call Control commands

5.1. Dial command   D

Command syntax: ATD <Numb> [I / i] [G/g] [;]

ATD> <PhbStr> [I / i] [G/g] [;]

ATD> mem <n> [I / i] [G/g] [;]

ATD> <PhbIndex> [I / i] [G/g] [;]

ATD <GSM sequence>

The ATD command is used to **establish a speech, data or fax call**. According to GSM 02.30, dial command also controls supplementary services.

For a **data** or **fax call**, the application sends to the GSM module the following ASCII string : (the bearer has to be selected before with the +CBST command)

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

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

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

Please, notice that in case of **international number**, the local international prefix has not to be set (usually 00) but need to be replaced by the **'+'** character.

Example : to establish a voice call to Wavecom from another country, the AT command shall be :

ATD+33146290800;

Notice that some country can have particular numbering rules for their GSM handset numbering.

The answer to the ATD command can be one of the following ones:

Verbose result code	Numeric (V0 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 GSM module.
BUSY	7	If the called party is already in communication
NO ANSWER	8	If no hang up is detected after a fixed network time-out
NO CARRIER	3	Call setup failed or remote user release. Use the AT+CEER command to know the **failure cause**

See paragraph 16.8 for the description of all **numeric result codes** (ATV0)

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

ATD> <index>; for calling <index> from the selected phonebook (by +CPBS command)

ATD> "BILL"; for calling "BILL" from the the selected phonebook

ATD> mem <index> (mem is **"SM"**, **"FD"** or **"ON"**, see +CPBS command) is a way to directly dial from a phonebook number.

Application to GSM	AT+CPBS?	*Which phonebook is selected ?*
GSM to application	+CPBS:"FD",5,10	*FDN phonebook is*

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		selected, 5 locations are used and 10 locations are available.
Application to GSM	ATD>SM6;	*Call index 6 from ADN phonebook*
GSM to application	OK	*Call succeeds*

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

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

It's allowed to override the **CLIR supplementary service** subscription for **this call only**.

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

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

It's allowed to control the **CUG supplementary service** information by **"G"** or **"g"** for **this call only**. The index and info values set with command +CCUG are used.

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

When trying to make an outgoing call while there is an active call, the active call is first **put on hold**, then the call setup is made.

According to GSM 02.30, **GSM sequences** may be controlled using dial command. These sequences can contain **"*", "#"**. But **";"** is forbidden.

If the sequence is not supported or fails, `+CME ERROR: <err>` is returned.

See paragraph 16.11 to have the list of supported sequences.

Application to GSM	ATD*#21#	*Check all call forwarding status*
GSM to application	+CCFC: 0,7	*No call forwarding*

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Application to GSM	ATD**61*+33146290800**25#	*Register call forwarding on no reply, with no reply timer fixed at 25 s.*
GSM to application	OK	*Done*
Application to GSM	ATD*2#	*Bad sequence*
GSM to application	+CME ERROR 3	

5.2. Hang-Up command   H

The command ATH (or ATH0) is used by the application to disconnect the remote user. In case of multiple calls, all calls are released (active, held and waiting calls).

The specific Wavecom command ATH1 has been appended to disconnect only the outgoing call. It can be useful in case of multi communication.

Application to GSM	ATH	*ask for disconnection*
GSM to application	OK	*All calls, if any, are released*
Application to GSM	ATH1	*ask for outgoing call disconnection*
GSM to application	OK	*Outgoing call, if any, is released*

5.3. Answer a call   A

When the GSM module receives a call, it set the **RingInd** signal and sends to the application the ASCII string "**RING**" or "**+CRING: <type>**" if cellular result code (+CRC) is enabled. Then it waits for the application to accept the call.

GSM to application	RING	*Incoming call*
Application to GSM	ATA	*Answer to this incoming call*
GSM to application	OK	*Call accepted*
Application to GSM	ATH	*Disconnect call*
GSM to application	NO CARRIER	*Call disconnected*

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5.4. Remote disconnection

This message is used by the GSM module to indicate to the application that an active call has been released by the remote user.

The GSM module sends "**NO CARRIER**" to the application, and set the DCD signal.

Also, in case AOC, the module can stop the communication if the credit is over (release cause 68 with +CEER command)

5.5. Extended error report   +CEER

If the last call setup (originating or answering) fails, this command gives the reason of the call release.

Application to GSM	ATD123456789 ;	outgoing voice call
GSM to application	NO CARRIER	Call setup failure
Application to GSM	AT+CEER	ask for reason of release
GSM to application	+CEER : Error <xxx> OK	<xxx> is the cause information element values from GSM recommandation 04.08 or specific

The cause information element from GSM 04.08 is given below in chapter 16.4, or in chapter 16.5 for specific failure causes.

The "NO CARRIER" indicates that the AT+CEER information is available for a failure diagnostic.

5.6. DTMF signals   +VTD, +VTS

The GSM module offers the user application to send DTMF tones on the GSM network. One command shall be used for defining the duration of the tones (default value is 300 ms), the other for sending the Tones.

For defining the duration, the application uses :

AT+VTD=<n>   where <n>*100 gives the duration in ms.

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If n < 4 the tone duration is 300 ms.

Application to GSM	AT+VTD=6	for defining 600 ms tone duration
GSM to application	OK	command valid
Application to GSM	AT+VTD=0	for setting the manufacturer default value
GSM to application	OK	

For sending DTMF tones (only when an active call exists), the application uses :

AT+VTS=<Tone>   where <Tone> is in {0-9,*,#,A,B,C,D}

Application to GSM	AT+VTS=A	
GSM to application	OK	command valid
Application to GSM	AT+VTS=11	
GSM to application	+CME ERROR: 4	if the <Tone> is wrong
Application to GSM	AT+VTS=4	
GSM to application	+CME ERROR: 3	if there is no communication

Example : to send the Tone sequence 13#, the application shall send :

AT+VTS=1;+VTS=3;+VTS=#
OK

5.7. Redial last number   ATDL

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

Application to GSM	ATDL	*redial last number*
GSM to application	0146290800; OK	*last call was a speech call* *command valid*

5.8. Automatic dialing with DTR   AT%Dn

This command allows to activate and deactivate automatic dialing of the phone number stored in the ifirst location of ADN phonebook. The number is dialed on DTR OFF to ON transition.

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<u>Sets commands</u> :   **AT%D<n>[;]**

<u>Options</u> :   **n**   **(0-1)**   for activate or deactivate the automatic dialing.

                          ;   Informs the module that the number is a voice rather than a fax or data number.

AT%D0	Deactivates automatic DTR dialing.
AT%D1;	Activates automatic DTR dialing if DTR switches from OFF to ON; Dials the phone number in the first location of ADN phonebook. **Speech call**
AT%D1	Activates automatic DTR dialing if DTR switches from OFF to ON; Dials the phone number in the first location of ADN phonebook. **Data or Fax call.**

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Example :

Application to GSM	AT%D1;	*Activates DTR dialing.*
GSM to application	OK	*Command has been executed.*
	DTR is OFF DTR switches ON	*The number in the first location of the ADN phonebook is dialed automatically.*
	DTR switches OFF	*The module goes on-hook.*

5.9. Automatic answer   ATS0

This S0-parameter controls the automatic answering feature of the mobile.

Application to GSM	ATS0=2	*Automatic answer after 2 rings*
GSM to application	OK	
Application to GSM	ATS0?	*Current value*
GSM to application	002 OK	*always 3 characters with leading zeros*
Application to GSM	ATS0=0	*no automatic answer*
GSM to application	OK	*command valid*

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

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5.10. Incoming Call Bearer   +CICB

Command syntax :   AT+CICB= <mode>

This **specific** command is used for incoming call type when no incoming bearer is given (single numbering scheme, see +CSNS).

<mode> values :

0:    Data
1:    Fax
2:    Speech

Application to GSM	AT+CICB=1	If no incoming bearer, force a fax call
GSM to Application	OK	Command accepted
Application to GSM	AT+CICB=2	If no incoming bearer, force a speech call
GSM to Application	OK	Command accepted
Application to GSM	AT+CICB?	Interrogate value
GSM to Application	+CICB: 2	Default incoming bearer: speech call
Application to GSM	AT+CICB=?	Test command
GSM to Application	+CICB: (0-2)	Speech, data or fax default incoming bearer

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5.11. Gain control   +VGR, +VGT

This command shall be used by the application to tune the receive gain of the speaker and transmit gain of the microphone. The application shall send

AT+VGR=<val>	for the receive gain	AT+VGT=<val>	for the transmit gain
0 to 15	+12 db	0 to 31	+14 db
16 to 31	+8.9 db	32 to 63	+17 db
32 to 47	+7.5 db	64 to 95	+20 db
48 to 63	+5.1 db	96 to 127	+23 db
64 to 79	+2.9 db	128 to 159	+26 db
80 to 95	+0.5 db	160 to 191	+29 db
96 to 111	-1.8 db	192 to 223	+32 db
112 to 127	-3.7 db	224 to 255	+35 db
128 to 143	-6.5 db		
144 to 159	-8.9 db		
160 to 175	-11.2 db		
176 to 191	-13.6 db		
192 to 207	-16 db		
208 to 223	-18.5 db		
224 to 239	-21 db		
240 to 255	-23.5 db		

16 levels for receive gain are provided and 8 levels for transmit gain.

Application to GSM	AT+VGR=25	
GSM to application	OK	Command valid
Application to GSM	AT+VGT=45	
GSM to application	OK	Command valid

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5.12. Microphone Mute Control   +CMUT

Command syntax: AT+CMUT = <mode>

This command instructs the module to set the microphone mute or not for the active microphone (defined with+SPEAKER command). This command is only allowed during a call.

<mode> takes the following values :

0 : microphone mute off (default value).
1 : microphone mute on.

Application to GSM	AT+CMUT=?	*Test command*
GSM to application	+CMUT : (0,1) OK	Enable/disable mute
Application to GSM	AT+CMUT?	*Ask for current value*
GSM to application	+CMUT : 0 OK	Current value is OFF
Application to GSM	AT+CMUT=1	*Mute ON (call active)*
GSM to application	OK	Command valid
Application to GSM	AT+CMUT?	*Ask for current value*
GSM to application	+CMUT : 1 OK	Mute is active (call active)
Application to GSM	AT+CMUT=0	*Mute OFF (call not active)*
GSM to application	+CME ERROR: 3	Command not valid

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5.13. Speaker & Microphone selection   +SPEAKER

This **specific** command is used to choose the speaker and the microphone. The application shall send

AT+SPEAKER=<ActiveSpkMic>

	<ActiveSpkMic>
0	SPEAKER ONE, MICRO ONE
1	SPEAKER TWO, MICRO TWO

Application to GSM	AT+SPEAKER=0	SPEAKER ONE and MICRO one
GSM to application	OK	Command valid
Application to GSM	AT+SPEAKER?	
GSM to application	+SPEAKER: 0 OK	SPEAKER ONE and MICRO ONE are active

5.14. Echo Cancelation   +ECHO

Command syntax: AT+ECHO= <mode>, [<Taps>,<ConvTh>,<DbtS>, <FarS>, <EcDelay>]

This **specific** command is used to activate, deactivate or configure

the Echo Cancelation function (for voice calls, in small rooms, cars…)

Defined Values

<mode>:

   0: Deactivate Echo
   1: Activate Echo
   2: Configure the echo cancelation (automatically stored in E2P)

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<Taps> : Number of taps of the adaptive filter. This value is directly related to the length of the longest echo path (240 words = 30 ms echo path delay). Values from 1 to 192, default is **160**

<ConvTh> : Threshold for convergence parameter. This specifies the level of energy computed on <EcDelay> samples needed to assume algorithm convergence. A low value provides a high convergence and a high value a high stability. Values from 0 to 45, default is **12**.

<DbtS> : Double talk sensitivity. This reflect the ratio between received and sent energy to assume double talk occured. A low value provides a high sensibility and a high value a low one. Values from 0 to 10, default is **5**.

<FarS> : Far end speaker detection - algorithm adaptation. This is related to then energy level needed on the receive path to allow filter taps adaptation. If <FarS> = 0 the algorithm will always adjust the filter. Values from 0 to 1000, default is **512**.

<EcDelay> : Number of samples used to compute energy for algorithm convergence evaluation. Values from 1 to 30, default is **10**

Read Command: **AT+ECHO?**

This command returns the current settings of the Echo cancelation.

Returns:+ECHO:<Status>,<Taps>,<ConvTh>,<DbtS>,<FarS>, <EcDelay>

<Status>	**0**	Echo Desactivate.
	1	Echo Activate for Mic/Speak one.
	2	Echo Activate for Mic/Speak two.

Example:

Application to GSM	AT+SPEAKER?	
GSM to application	+SPEAKER: 0 OK	SPEAKER ONE and MICRO ONE are active
Application to GSM	AT+ECHO=1	Active Echocancelation for Mic/Speak one.
GSM to application	OK	
Application to GSM	AT+ECHO?	Read current settings
GSM to application	+ECHO: 1,160,12,5,512,10 OK	

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Application to GSM	AT+ECHO=2	Configure the Echo cancelation
GSM to application	+CME ERROR: 3	The parameters are missing.
Application to GSM	AT+ECHO=2,0,12,5,512,10	Configure the Echo cancelation
GSM to application	+CME ERROR: 3	The <Taps> parameter is wrong. Values from 1 to 192

5.15. SideTone modification   +SIDET

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

This **specific** command is used to get an echo of the voice in the speaker (to have a microphone feedback in the speaker)

<val2>	Level	<val1>	Presence
0	0 db	0	SideTone is disabled
1	- 6 db	1	SideTone is enabled
2	-12 db		
3	-18 db		

Application to GSM	AT+SIDET=1,0	
GSM to application	OK	Command valid
Application to GSM	AT+SIDET?	Current value
GSM to application	+SIDET: 1,0 OK	Command valid

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5.16. Initialise Voice Parameters +VIP

This command allows to restore the factory settings about the voice parameters from EEPROM.

These voice parameters include :

- Gain control,
- Microphone mute control,
- Speaker & Microphone selection,
- Echo cancelation,
- Side tone modification.

Command	Return
AT+VIP=<n>	
AT+VIP=?	+VIP: 1
AT+VIP?	+VIP: (1)

Example :

Application to GSM	AT+VIP?	
GSM to application	+VIP: 1 OK	
Application to GSM	AT+VIP=2	Syntax error
GSM to application	+CME ERROR: 3	
Application to GSM	AT+VIP=1	Restore the factory settings in EEPROM.
GSM to application	OK	The command has been executed
Application to GSM	AT+VIP=?	List of supported <n>s
GSM to application	+VIP: (1) OK	

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6. Network service commands

6.1. Signal Quality   +CSQ

This command shall be used to know the *received signal strength indication* (<rssi>) and the *channel bit error rate* (<ber>) with or without any SIM card inserted.

<rssi> :

    0   : -113 dBm or less
    1   : -111 dBm
    2...30 : -109 to -53 dBm
    31   : -51dBm or greater
    99   : not known or not detectable

<ber> :

    0...7 : as RXQUAL values in the table GSM 05.08
    99   : not known or not detectable

Application to GSM	AT+CSQ	
GSM to application	+CSQ: <rssi>,<ber> OK	<rssi> and <ber> as defined before

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6.2. Operator selection   +COPS

To select the operator, three possibilities exist :

1- The mobile enters the **manual** mode, and then try to find an operator which is indicated by the application. If it finds and registers correctly, then the mobile stays in idle mode.

2- The mobile enters the **automatic** mode, and then try to find the home operator. If it finds and registers correctly, then the mobile stays in idle mode ; if not, the mobile search automatically another network.

3- The mobile enters the **manual/automatic** mode, and then try to find an operator which is indicated by the application (like in manual mode) . If this attempt fails the **automatic** mode is entered.

Read command returns the current mode and the currently selected operator. Just notice that in manual mode, this PLMN could not be the one the mobile has to register (searching phase).

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

Command syntax:

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

Possible responses for AT+COPS=<mode>:

   OK   (Network is selected in full service)

   +CME ERROR: 30   (No network service),

   +CME ERROR: 32   (Network not allowed – emergency calls only)

   +CME ERROR: 3   (During a call not allowed)

   +CME ERROR: 4   (Wrong parameters)

Response syntax for AT+COPS?:

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

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Response syntax for AT+COPS=?:

+COPS: [list of supported (<stat>, long alphanumeric <oper>,

short alphanumeric <oper>s, numeric <oper>) s]

The parameters values are the following ones:

<mode>:

0: automatic (**default** value)
1: manual
3: set only <format> (for read command AT+COPS?)
4: manual / automatic (<oper> shall be present), if manual selection fails, automatic mode is entered.

<format>: format of <oper> field

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

<stat>: status of <oper>

0: unknown
1: available
2: current
3: forbidden

<oper>: operator identifier (MCC/MNC in numeric format only for operator selection).,

Long alphanumeric format can be up to 16 characters long (see appendice 16.12 for operator names description, field is "Name")

Short alphanumeric format can be up to 8 characters long.

Application to GSM	AT+COPS?	*Ask for current plmn*
GSM to application	+COPS: 0,2,20801 OK	*Home PLMN is France telecom Itineris*

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Application to GSM	AT+COPS=?	*Ask for PLMN list*
GSM to application	+COPS: (2,"F Itineris", "Itine","20801"), (3,"F SFR", "SFR","20810") OK	*Home PLMN is France Telecom SFR network has been seen*
Application to GSM	AT+COPS=1,2,20810	*Ask for registration on SFR network*
GSM to application	+CME ERROR: 32	Network not allowed – emergency calls only
Application to GSM	AT+COPS=1,1,20810	*Ask for registration on SFR network*
GSM to application	+CME ERROR: 3	*Operation not allowed*
Application to GSM	AT+COPS=0,2	*Ask for registration on home network*
GSM to application	OK	*Succeed*
Application to GSM	AT+COPS=3,0	*Ask for setting alphanumeric format*
GSM to application	OK	*Succeed*
Application to GSM	AT+COPS?	*Ask for current plmn*
GSM to application	+COPS: 0,0,"F Itineris" OK	*Home PLMN is France telecom Itineris*
Application to GSM	AT+COPS=1,0,"F SFR"	*Ask for registration on SFR network*
GSM to application	+CME ERROR: 32	Network not allowed – emergency calls only
Application to GSM	AT+COPS=4,0,"F SFR"	*Ask for registration on SFR network in manual/automatic mode*
GSM to application	OK	*Command succeed*
Application to GSM	AT+COPS?	*Ask for current plmn*
GSM to application	+COPS: 0,0,"F Itineris" OK	*Home PLMN is France telecom Itineris ! So the attempt to register on SFR Network has failed but the automatic selection on Home PLMN has succeed.*

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6.3. Network registration +CREG

This command is used by the application to know the registration status of the mobile.

Command syntax :   AT+CREG= <mode>

Response syntax :   +CREG: <mode>, <stat> [,<lac>,<ci>]

for AT+CREG? command only

<mode>

0: Disable network registration unsolicited result code (**default**)

1: Enable network registration code result code +CREG : <stat>

2: Enable network registration and location information unsolicited result code +CREG: <stat>,<lac>,<ci> if there is a change of the network cell.

<stat>

0 : not registered, ME is not currently searching a new operator

1 : registered, home network

2 : not registered, ME 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 (e.g. "00C3" equals 193 in decimal)

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

Application to GSM	AT+CREG?	
GSM to application	+CREG: <mode>,<stat> OK	*as defined before*
Application to GSM	AT+CREG=<mode>	*disable/enable network registration unsolicited result code*
GSM to application	OK	*command valid*
Application to GSM	AT+CREG=?	
GSM to application	+CREG: (0-2)	*0,1,2 <mode> values are supported*

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6.4. Read operator name +WOPN

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

Command syntax: AT+WOPN=<format>,<NumOper>

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

<format> is the required format. Only long (0) and short (1) alphanumeric formats are supported.

<NumOper> is the operator in numeric format.

<AlphaOper> is the operator in long or short alphanumeric format (see appendice 16.12 for operator names description)

Application to GSM	AT+WOPN=?	*Test command*
GSM to application	OK	
Application to GSM	AT+WOPN=0,20801	*Give an operator in numeric format*
GSM to application	+WOPN: 0,"F Itineris" OK	*Alphanumeric answer*
Application to GSM	AT+WOPN=0,99999	*Give a wrong operator*
GSM to application	+CME ERROR : 22	*Not Found*

6.5. Preferred operator list   +CPOL

This command is used to edit the SIM preferred list of networks.

Command syntax: AT+CPOL= [<index>][, <format> [, <oper>]]

The different possibilities are:

AT+CPOL = <index>   to delete an entry.

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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> .

The supported format are those of the +COPS command.

The length of this list is limited to 8 entries .

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Application to GSM	AT+CPOL?	*Ask for preferred list of networks*
GSM to application	+CPOL: 1,2,26201 +CPOL: 6,2,20810 OK	*Preferred list of networks in numeric format*
Application to GSM	AT+CPOL=,0	*Select long alphanumeric format*
GSM to application	OK	
Application to GSM	AT+CPOL?	*Ask for preferred list of networks*
GSM to application	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" OK	*Preferred list of networks in long alphanumeric format*
Application to GSM	AT+CPOL=7,2,20801	*Add a network to the list*
GSM to application	OK	
Application to GSM	AT+CPOL?	*Ask for preferred list of networks*
GSM to application	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 7,0,"F Itineris" OK	*Preferred list of networks in long alphanumeric format*
Application to GSM	AT+CPOL=7	*Delete 7th location*
GSM to application	OK	
Application to GSM	AT+CPOL?	*Ask for preferred list of networks*
GSM to application	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" OK	*Preferred list of networks in long alphanumeric format*
Application to GSM	AT+CPOL=8,2,77777	*Add an inexistent network to the list*
GSM to application	OK	
Application to GSM	AT+CPOL?	*Ask for preferred list of networks*
GSM to application	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 8,2,77777 OK	*Preferred list of networks in long alphanumeric format but 8th entry is unknown so the module edits it in the numeric format.*
Application to GSM	AT+CPOL=9,0,"F Itineris"	*Add an inexistent network to the list Format text*
Application to GSM	AT+CPOL?	*Ask for preferred list of networks*
GSM to application	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 8,2,77777 +CPOL: 9,0,"F Itineris" OK	*Preferred list of netwoks in long alphanumeric format.*

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7. Security commands

7.1. Enter PIN +CPIN

This command is used to enter ME passwords (CHV1 / CHV2 / PUK1 / PUK2…) which are needed before any other functionality of the ME can be used. The **CHV1/CHV2 length** is between **4** and **8** digits, the **PUK1/PUK2** length is **8 digits only**.

If the user application try to establish an outgoing call before having validated the SIM PIN code (CHV1), then the GSM module will refuse the "ATD" command with a "+CME ERROR: 11" (SIM PIN required).

It's up to the application to validate the PIN after each reset or power on if the PIN was enabled. The application shall therefore use the command :

   AT+CPIN=<pin>

Application to GSM	AT+CPIN=1234	*enter PIN*
GSM to application	OK	*PIN code is correct*
Application to GSM	AT+CPIN=5678	*enter PIN*
GSM to application	+CME ERROR: 3	*operation not allowed, PIN previously entered*

After 3 unsuccessful codes, the PUK will then be required. The PUK validation forces the user to enter as a second parameter a new PIN code which will be the new PIN code if the PUK validation succeeds. The CHV1 is then **enabled** if the PUK1 is correct. The application shall therefore use the command :

   AT+CPIN=<Puk>,<NewPin>

Application to GSM	AT+CPIN=00000000,1234	*enter PUK and new PIN*
GSM to application	+CME ERROR: 16	*Incorrect PUK*
Application to GSM	AT+CPIN=12345678,1234	*enter PUK and new PIN, 2nd attempt*
GSM to application	OK	*PUK correct, new PIN stored*

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To know which code has to be entered (or not), the following interrogation command can be used :

AT+CPIN?

The possible responses are :

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

Please note that in this case the mobile does not finish its response with the OK string.

The response +CME ERROR : 13 (SIM failure) is returned after 10 unsuccessful PUK presentations. The SIM card is then out of order and shall be replaced by a new one.

Example : 3 failed PIN validations + 1 successful PUK validation

AT+CPIN? +CPIN: SIM PIN	Read the PIN status The GSM module requires SIM PIN
AT+CPIN=1235 +CME ERROR: 16	First attempt to enter a SIM PIN Bad PIN
AT+CPIN=1236 +CME ERROR: 16	Second attempt Bad PIN
AT+CPIN=1237 +CME ERROR: 16	Third attempt Bad PIN
AT+CPIN? +CPIN: SIM PUK	Read PIN state The GSM module 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 GSM module is ready

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If the user try to do something which requires PIN2 (CHV2) the GSM module will refuse his action with a "+CME ERROR: 17" (SIM PIN2 required). Then the GSM module is waiting SIM PIN2 to be given.

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

For instance, the GSM module needs PIN2 to write in the fixed dialling phonebook (FDN) , so if SIM PIN2 authentification has not been done during the current cession the SIM PIN2 is required:

Application to GSM	AT+CPBS="FD"	*Choose FDN*
GSM to application	OK	
Application to GSM	AT+CPBW=5,"01290917",129,"Jacky"	*write in FDN at location 5*
GSM to application	+CME ERROR:17	*SIM PIN2 is required*
Application to GSM	AT+CPIN?	
GSM to application	SIM PIN2	*SIM PIN2 is required*
Application to GSM	AT+CPIN=5678	*Enter SIM PIN2*
GSM to application	OK	
Application to GSM	AT+CPBW=5,"01290917",129,"Jacky"	*write in FDN at location 5*
GSM to application	OK	*Now writing in FDN is allowed*

Please note that the GSM module ask only once PIN2 or PUK2, so if they aren't entered right, the next +CPIN? command will return "+CPIN: READY".

Remark

In the way Application to GSM, an "h" character shall be added before the PIN value if cyphering mode (with D.E.S algorithm) is on. See +EXPKEY command.

Same remark for +CLCK and +CPWD commands.

7.2. Enter PIN2+CPIN2

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.

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Of course +CPIN command allows to validate PIN2 or PUK2 codes but **only** when the **last executed command resulted in PIN2 authentification failure.**

The PIN2 length is between 4 and 8 digits, the PUK2 length is 8 digits only.

AT+CPIN2=<pin2>

Application to GSM	AT+CPIN2=1234	*enter PIN2*
GSM to application	OK	*PIN2 code is correct*
Application to GSM	AT+CPIN2=5678	*enter PIN2*
GSM to application	+CME ERROR: 3	*operation not allowed, PIN2 previously entered*

After 3 unsuccessful codes, the PUK2 will then be required. The PUK2 validation forces the user to enter as a second parameter a new PIN2 code which will be the new PIN2 code if the PUK1 validation succeeds. The application shall therefore use the command :

AT+CPIN2=<puk2>,<NewPin2>

Application to GSM	AT+CPIN2=00000000,1234	*enter PUK2 and new PIN2*
GSM to application	+CME ERROR: 16	*Incorrect Password (PUK2)*
Application to GSM	AT+CPIN2=12345678,1234	*enter PUK2 and new PIN1, 2nd attempt*
GSM to application	OK	*PUK2 correct, new PIN2 stored*

To know which code has to be entered (or not), the following interrogation command can be used :

AT+CPIN2?

The possible responses are :

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

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7.3. PIN remaining attempt number   +CPINC

This **specific** command instructs the module to display the number of valid tries for PIN1 (CHV1), PIN2 (CHV2), PUK1 (UNBLOCK CHV1) and PUK2 (UNBLOCK CHV2) identifiers.

<u>Command syntax :</u>   AT+CPINC

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

<n1>, <n2> are the remaining tries of PIN1, PIN2 (0 = blocked, 3 max)

<k1>, <k2> are the remaining tries of PUK1, PUK2 (0 = blocked, 10 max)

To make it running, the card should be present at the initialisation time, in the opposite case, an error will be sent (+CME ERROR : 10).

Application to GSM	AT+CPINC	*Ask remaining tries*
GSM to application	+CPINC : 2,3,10,10	*First CHV1 attempt was a failure*
Application to GSM	AT+CPINC?	*Ask current values*
GSM to application	+CPINC : 2,3,10,10	*First attempt was a failure*
Application to GSM	AT+CPINC=?	*Ask possible values*
GSM to application	OK	

7.4. Facility lock   +CLCK

This command shall be used by the application to lock, unlock or interrogate a ME or network facility <fac>.

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

<u>Response syntax:</u> +CLCK: <status> [,<class1>]

                <CR><LF>+CLCK: <status>,<class2>

        […]]

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The following **<fac>** values are supported:

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

"SC" : PIN enable (<mode> = 1) / disable (<mode> = 0)

"AO" : BAOC (Barr All Outgoing Calls)

"OI" : BOIC (Barr Outgoing International Calls)

"OX" : BOIC-exHC (Barr Outg. Internat Calls except to Home Country)

"AI" : BAIC (Barr All Incoming Calls)

"IR" : BIC-Roam (Barr Inc. when Roaming outside Home Country)

"AB" : All Barring services

"AG" : All outGoing barring services

"AC" : All inComing barring services

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

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

1 : Voice (telephony)
2 : Data (refer 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 / desactivation / interrogation of all classes.

The password maximum length is given with the AT+CPWD=? command.

Application to GSM	AT+CLCK="SC",1,1234	*enable PIN*
GSM to application	OK	*PIN was right*
Application to GSM	AT+CLCK?	*Read PIN status*
GSM to application	+CLCK: ("PS", 0),("SC", 1), ("PN",0), ("FD",0) OK (**no longer supported** in GSM 07.07)	*PIN is enabled, no SIM lock, no network lock, no information on Call barring*
Application to GSM	AT+CLCK="SC",0,5555	*disable PIN*
GSM to application	+CME ERROR: 16	*PIN was wrong*
Application to GSM	AT+CPIN=1234	*Enter PIN*
GSM to application	OK	*PIN was good*
Application to GSM	AT+CLCK= ?	*request supported facilities*
GSM to application	+CLCK : ("PS","SC","AO","OI", "OX", "AI", "IR","AB", "AG","AC", "FD", "PN") OK	*supported facilities*
Application to GSM	AT+CLCK="PN",1,12345678	*Activate network lock*
GSM to application	OK	*Network lock activated*
Application to GSM	AT+CLCK="AO",1,1234,2	*Activate All Outgoing Calls Barring for Data Calls*
GSM to application	OK	*Call Barring is activate*
Application to GSM	AT+CLCK="AO",2	*Query BAOC status*
GSM to application	<CR><LF> +CLCK : 1,2 OK	*BAOC activate for Data calls only*

7.5. Change password   +CPWD

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

This command shall be used by the application to change a password (PIN, call barring, NCK...). The facility values (<fac>) are the same as for +CLCK command, with a "P2" facility to manage SIM PIN2.

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

Application to GSM	AT+CPWD=?	*Possible values*
GSM to application	+CPWD: ("PS", 8),("SC", 8),("AO", 4), ("OI", 4), ("OX", 4),("AI", 4),("IR", 4),	*CHV1/CHV2 must be on 8 digits maximum (4 min)*

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	("AB", 4), ("AG", 4), ("AC", 4), ("P2", 8), ("FD", 8), ("PN", 8) OK	*For Call Barring, 4 digits maximum*
Application to GSM	AT+CPWD="SC",1234,5555	*change PIN*
GSM to application	OK	*PIN iwas good*
Application to GSM	AT+CPWD="SC",1234,5555	*Change PIN*
GSM to application	+CME ERROR: 16	*PIN was wrong*
Application to GSM	AT+CPIN=5555	*Enter PIN*
GSM to application	OK	*PIN was good*
Application to GSM	AT+CPWD="PN",12345678,00000000	*change NCK*
GSM to application	OK	*NCK changed for net lock*

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8. Phonebook commands

8.1. Select phonebook memory storage +CPBS

This command selects phonebook memory storage. The available phonebooks are the ADN (SIM), FDN (SIM fixdialling, restricted phonebook), MSISDN (SIM own numbers) and EN (SIM emergency number) phonebooks.

Application to GSM	AT+CPBS= "SM"	*Select ADN phonebook*
GSM to application	OK	*ADN phonebook is selected*
Application to GSM	AT+CPBS=?	*Possible values*
GSM to application	+CPBS: ("SM","FD","ON","EN") OK	*ADN, FDN, MSISDN phonebooks supported*
Application to GSM	AT+CPBS ?	*Status*
GSM to application	+CPBS : "SM",10,20 OK	*ADN phonebook selected, 10 used locations, 20 locations available*

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

8.2. Read phonebook entries +CPBR

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

Application to GSM	AT+CPBR=?	*Test command*
GSM to application	+CPBR: (1-50), 20,10 OK	*50 locations (from 1 to 50), max length of 20 for phone 10 characters max for the associated text*
Application to GSM	AT+CPBR=12,14	*Read entries from 12 to 14*

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GSM to application	+CPBR : 12,"112",129,"Emergency" +CPBR : 13,"+331290909",145, "Fred" +CPBR : 14, "0146290808",129, "Zazi" OK	*Display locations 12,13,14 with Location, Number, Type (TON/NPI), Text*
Application to GSM	AT+CPBR=10	*Read entry 10*
GSM to application	+CPBR :10,"0146290921",129,"Rob" OK	*Display location 10*
Application to GSM	AT+CPBR=52	*Read entry 52 (wrong)*
GSM to application	+CME ERROR: 21	*Invalid index*

8.3. Find phonebook entries +CPBF

This command returns phonebook entries which alphanumeric field start with a given string. The AT+CPBF= "" command can be used to display all phonebook entries sorted in alphabetical order.

This command is not allowed for "EN" phonebook, which does not contain alphanumeric field.

Application to GSM	AT+CPBF=?	*Test command*
GSM to application	+CPBF: 20,10 OK	*max length of 20 for phone 10 characters for the text*
Application to GSM	AT+CPBF= "E"	*Read entries with* "E"
GSM to application	+CPBF : 12,"112",129,"Emergency" +CPBF : 15,"+331290101",145, "Eric" OK	*Display locations with text field starting with* "E"
Application to GSM	AT+CPBF="H"	*Read entries with* "H"
GSM to application	+CME ERROR: 22	*Entry not found*

8.4. Write phonebook entry +CPBW

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

This command is not allowed for "EN" phonebook, which is not writable.

Application to GSM	AT+CPBW=?	*Test command*
GSM to application	+CPBW: (1-50),20,(129,145),10	*50 locations, phone*

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	OK	*length=20, TON/NPI of 129 or 145, text length=10*
Application to GSM	AT+CPBW=3	*Erase location 3*
GSM to application	OK	*Location 3 erased*
Application to GSM	AT+CPBW=5,"112",129 ,"SOS"	*Write at location 5*
GSM to application	OK	*Location 5 written*
Application to GSM	AT+CPBW=5,"01290917",129,"Jacky"	*Overwrite location 5*
GSM to application	OK	*Location 5 is overwritten*
Application to GSM	AT+CPBW=,"+33145221100",145, "SOS"	*Write at the first free location*
GSM to application	OK	*Free location is written*
Application to GSM	AT+CPBW=,"0345221100",129,"SOS"	*Write at the first free location*
GSM to application	+CME ERROR: 20	*Phonebook full*
Application to GSM	AT+CPBW=57,"112",129 ,"WM"	*Write at loc 57 (wrong)*
GSM to application	+CME ERROR: 21	*Invalid index*
Application to GSM	AT+CPBW=7,"012345678901234567890",129 ,"WAVE"	*Write at loc 7 a long Phone number (21 digits)*
GSM to application	+CME ERROR: 26	*Phone too long*
Application to GSM	AT+CPBW=7,"0122334455",129 , "WAVECOM TEL"	*Write at loc 7 a long Text (11 characters)*
GSM to application	+CME ERROR: 24	*Text too long*

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

But if PIN2 authentification has been done during the current cession , +CPBW command with FDN is allowed .

Application to GSM	AT+CPBS="FD"	*Choose FDN*
GSM to application	OK	
Application to GSM	AT+CPBW=5,"01290917",129,"Jacky"	*write in FDN at location 5*
GSM to application	+CME ERROR:17	*SIM PIN2 is required*
Application to GSM	AT+CPIN?	
GSM to application	SIM PIN2	*SIM PIN2 is required*
Application to GSM	AT+CPIN=5678	*Enter SIM PIN2*
GSM to application	OK	
Application to GSM	AT+CPBW=5,"01290917",129,"Jacky"	*write in FDN at location 5*

GSM to application	OK	*Now writing in FDN is allowed*

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8.5. Phonebook phone search +CPBP

This **specific** command instructs the module to look in the phonebook for an item having the same phone number that defined in parameter.

Command syntax :   AT+CPBP=<PhoneNumber>

<PhoneNumber> is coded like all phone numbers in GSM 07.07 or GSM 07.05 .

Application to GSM	AT+CPBP= "+331290101"	*Read entries with this phone number*
GSM to application	+CPBP : 15,"+331290101",145, "Eric" OK	*Display location with this phone number*
Application to GSM	AT+CPBP= "+331290101"	*Read entries with this phone number*
GSM to application	+CPBP : 15,"+331290101",145, "Eric" OK	*Display location with this phone number*
Application to GSM	AT+CPBP= "+331290101"	*Read entries with this phone number*
GSM to application	+CPBP : 15,"+331290101",145, "Eric" OK	*Display location with this phone number*
Application to GSM	AT+CPBP "01290101"	*Read entries with this phone number*
GSM to application	+CPBP : 15,"+331290101",145, "Eric" OK	*Display location with this phone number*
Application to GSM	AT+CPBP= "0129"	*Read entries with* "H"
GSM to application	+CME ERROR: 22	*Entry not found*

8.6. Move action in phonebook +CPBN

Command syntax: AT+CPBN = <mode>

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

This command is not allowed for "EN" phonebook, which does not contain alphanumeric field.

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<mode> may take the following values : 0 for First item, 1 for Last item, 2 for Next valid item in alphabetical order, 3 for Previous valid item in alphabetical order, 4 for Last read item and 5 for Last written item.

Application to GSM	AT+CPBN= ?	*Test Command*
GSM to application	+CPBN=<0-3>	*Possible Modes*
Application to GSM	AT+CPBN= 0	*Read the first location*
GSM to application	+CPBN : 15,"+331290101",145, "Eric" OK	*Display the first location*
Application to GSM	AT+CPBN=2	*Read the next location*
GSM to application	+CPBN :5,"+33147658987",145, "Frank" OK	*Display the second location*
Application to GSM	AT+CPBN=2	*Read the next location*
GSM to application	+CPBN : 6,"+331290302",145, "Marc" OK	*Display the third location*
Application to GSM	AT+CPBN=3	*Read the previous location*
GSM to application	+CPBN :5,"+33147658987",145, "Frank" OK	*Display the second location*
Application to GSM	AT+CPBN=1	*Read the last location*
GSM to application	+CPBN : 6,"+331290302",145, "Marc" OK	*Display the last location*
Application to GSM	AT+CPBN=2	*Read the next location*
GSM to application	+CPBN : 15,"+331290101",145, "Eric" OK	*Display the first location*

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

Application to GSM	AT+CPBF="Er"	*Find "Er" in phonebook*
GSM to application	+CPBF : 15,"+331290101",145, "Eric" OK	*Display this location*
Application to GSM	AT+CPBN=2	*Read the next location*
GSM to application	+CPBN :5,"+33147658987",145, "Frank" OK	*Display the following location*
Application to GSM	AT+CPBF="Er"	*Find "Er" in phonebook*
GSM to application	+CPBF : 15,"+331290101",145, "Eric" OK	*Display this location*
Application to GSM	AT+CPBN=4	*Read the Last read*

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		location
GSM to application	+CPBN :15,"+331290101",145, "Eric"	*Display the Last read location*
Application to GSM	AT+CPBW=,"0146290800",129, "WM"	*Write an item at the first free location*
GSM to application	OK	*No information about this location …*
Application to GSM	AT+CPBN=4	*Read the Last read location*
GSM to application	+CPBN :15,"+331290101",145, "Eric"	*Display the Last read location*
GSM to application	+CPBN : 38,"0146290800",129, "WM"	*Display the Last writen item with its location.*
Application to GSM	AT+CPBN=4	*Read the Last read item*
GSM to application	+CPBN : 38,"0146290800",129, "WM"	*Now the last read item is the last writen item too*

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

8.7. Subscriber number +CNUM

This command returns the MSISDN(s) related to the subscriber.

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

Command syntax :   AT+CNUM

Response syntax ;

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

        <CR><LF> +CNUM : <alpha2>, <number2>, <type2> ....

Defined values

<alphax>   : optional alphanumeric string associated with <numberx>

<numberx> : string type phone number of format specified by <typex>

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<typex>   : type of adress octet in integer format

Application to GSM	AT+CNUM	*Get MSISDN(s)*
GSM to application	+CNUM : "Phone" , "0612345678", 129 +CNUM : "Fax", "0687654321",129	*MSISDNs*
Application to GSM	AT+CNUM= ?	
GSM to application	OK	

8.8.   Avoid phonebook init +WAIP

This specific command allows to inhibit the initialization of SIM phonebooks (loading of the ADNs and FDNs only) during the next boots.

Command syntax :   AT+WAIP=<mode>

<mode>	Action
0	Normal initialization (with phonebooks)
1	No phonebook initialization for ADN and FDN

Application to GSM	AT+WAIP?	*current values ?*
GSM to application	+WAIP : 0 OK	*Default value (init phonebooks)*
Application to GSM	AT+WAIP= ?	*possible values ?*
GSM to application	+WAIP : (0,1) OK	*disable / enable*
Application to GSM	AT+WAIP=1	*Inhibit initialization of phonebooks (next boot)*
GSM to application	OK	*no answer*
Application to GSM	AT&W	*Save modifications in EEPROM*

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

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9. Short Messages commands

9.1. Parameters definition

<da>	Destination Address, coded like GSM 03.40 TP-DA
<dcs>	Data Coding Scheme, coded like in document [5].
<dt>	Discharge Time in string format : "yy/MM/dd,hh :mm :ss±zz" (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<fo>	First Octet, coded like SMS-SUBMIT first octet 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 octets
<mem1>	Memory used to list, read and delete messages (+CMGL, +CMGR and +CMGD).
<mem2>	Memory used to write and send messages (+CMGW, +CMSS).
<mid>	CBM Message Identifier.
<mr>	Message Reference.
<oa>	Originator Address.
<pid>	Protocol Identifier.
<pdu>	For **SMS** : GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format, coded as specified in doc [4] For **CBS** : GSM 03.41 TPDU in hexadecimal format
<ra>	Recipient Address.
<sca>	Service Center Address

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<scts>	Service Center Time Stamp in string format :	

"yy/MM/dd,hh :mm :ss±zz"
(Year/Month/Day,Hour:Min:Seconds±TimeZone)

<sn>   CBM Serial Number

<st>   Status of a SMS-STATUS-REPORT

<stat>   status of message in memory.

<tooa>   Type-of-Address of <oa>.

<tora>   Type-of-Address of <ra>.

<tosca> Type-of-Address of <sca>.

<total1> Number of message locations in <mem1>.

<total2> Number of messages locations in <mem2.

<used1> Total number of messages locations in <mem1>.

<used2> Total number of messages locations in <mem2.

<vp>   Validity Period of the short message, default value is 167

9.2. Select message service   +CSMS

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

The syntax is : AT+CSMS=<service>

<service> :

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

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

Application to GSM	AT+CSMS=0	*SMS AT command* Phase 2 version 4.7.0
GSM to application	+CSMS: 1, 1, 1 OK	*SMS-MO,SMS-MT and SMS-CB supported*
Application to GSM	AT+CSMS=1	*SMS AT command* Phase 2 +
GSM to application	+CMS ERROR: 301	*SMS service Phase 2+ not supported*
GSM to application	+CSMS: 0, 1, 1, 1 OK	*GSM 03.40 et 03.41 (SMS AT command* Phase 2 version 4.7.0*),*

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		SMS-MO,SMS-MT and SMS-CB supported
Application to GSM	AT+CSMS=?	*Possible service*
GSM to application	+CSMS: (0) OK	*Only GSM 03.40 et 03.41 is possible (SMS AT command Phase 2 version 4.7.0)*

9.3. Preferred Message Storage   +CPMS

This command allows to define the message storage area to be used for reading, writing…

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

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

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

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

<mem2>: Memory used to write and send messages

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

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

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

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

Application to GSM	AT+CPMS=?	*Possible message storages*
GSM to application	+CPMS: (("SM","BM"),("SM")) OK	*Read, list, delete: SMS or CBM* *Write,send: SMS*
Application to GSM	AT+CPMS?	*Read it*
GSM to application	+CPMS: "SM", 3, 10,"SM",3,10 OK	*Read, write…SMS from/to SIM* *3 SMS are stored in SIM. 10 is the* *total available SIM memory.*
Application to GSM	AT+CPMS="AM"	*Select false message storage*
GSM to application	+CMS ERROR: 302	
Application to GSM	AT+CPMS="BM"	*Select CBM message storage*
GSM to application	+CPMS: 2, 20,3,10 OK	*Read, list,delete CBM from RAM* *2 CBM are stored in RAM*

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Application to GSM	AT+CPMS?	*Read it*
GSM to application	+CPMS: "BM", 2, 20,"SM",3,10 OK	*Read, list,delete CBM from RAM* *Write SMS to SIM.*

9.4.   Preferred Message Format +CMGF

The formats implemented are the *text mode* and the *PDU mode*.

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

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

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

Application to GSM	AT+CMGF ?	*current message format*
GSM to application	+CMGF: 1 OK	*Text mode*
Application to GSM	AT+CMGF=?	*Possible message format*
GSM to application	+CMGF: (0-1) OK	*Text or PDU modes are* *available*

Example to send a SMS Message in PDU mode

Application to GSM	AT+CMGF=0	*PDU message format*
GSM to application	OK	*PDU mode valid*
Application to GSM	AT+CMGS=14<CR> 0001030691214365000004C9E9340B	*Send complete MSG in* *PDU mode, no SC address*
GSM to application	+CMGS: 4 OK	*MSG correctly sent, <mr>* *is returned*

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

The length of **octets** of the TPDU buffer is 14, coded as GSM 03.40

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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, e.g. octet with hexadecimal value 0x2A is presented to the mobile as two characters '2' (ASCII 50) and 'A' (ASCII 65).

9.5. Save Settings +CSAS

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

Application to GSM	AT+CSAS	*Store +CSCA and +CSMP parameters*
GSM to application	OK	*Parameters are saved*

9.6. Restore settings +CRES

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

Application to GSM	AT+CRES	*Restore +CSCA and +CSMP parameters*
GSM to application	OK	*Parameters are restored*

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9.7. Show text mode parameters   +CSDH

This commands gives more informations in text mode result codes. These informations are in brackets in commands +CMTI, +CMT, +CDS, +CMGR, +CMGL.

Application to GSM	AT+CSDH?	*current value*
GSM to application	+CSDH: 0 OK	*do not show header values*

9.8. New message indication   +CNMI

This command selects the procedure how receiving the message from the network.The application must send the following command :

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

<mode> : controls the processing of unsolicited result codes

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 unsollicited result codes will be the same than for <mode>=2.

0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE.
2	Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation. Otherwise forward them directly to the TE
3	Forward unsolicited result codes directly to the TE. TA-TE link specific inband used to embed result codes and data when TA is in on-line data mode.

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<mt> : sets the result code indication routing for SMS-DELIVERs. Default is 0.

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 unsollicited code : +CMT : [<alpha>,] <length> <CR> <LF> <pdu> (PDU mode) or +CMT : <oa>,[<alpha>,] <scts> [,<tooa>, <fo>, <pid>, <dcs>, <sca>, <tosca>, <length>] <CR><LF><data> (text mode)
3	Class 3 SMS-DELIVERS are routed directly using code in <mt>=2 ; Message of other classes result in indication <mt>=1

<bm> : set the rules for storing received CBMs (Cell Broadcast Message) types depend on its coding scheme, the setting of Select CBM Types (+CSCB command) and <bm>. 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. +CBM : <length><CR><LF><pdu> (PDU mode) or +CBM :<sn>,<mid>, <dcs>,<page>,<pages> (Text mode) <CR><LF> <data>
3	Class 3 CBMs : as <bm>=2. Other classes CBMs : as <bm>=1.

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

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

<bfr> Default is 0.

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

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

9.9. Read message +CMGR

This command allows the application to read stored messages.

Command syntax :   AT+CMGR=<index>

Response syntax for text mode:

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

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

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Response syntax for PDU mode:

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

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

Example :

GSM to application	+CMTI: "SM",1	*New message received*
Application to GSM	AT+CMGR=1	*read the message*
GSM to application	+CMGR: "REC UNREAD", "0146290800","98/10/01,18 :22 :11+0 0" , <CR><LF> ABCdefGHI OK	
Application to GSM	AT+CMGR=1	*read again the message*
GSM to application	+CMGR: "REC READ", "0146290800","98/10/01,18 :22 :11+0 0", <CR><LF> ABCdefGHI OK	*message is read now,*
Application to GSM	AT+CMGR=2	*Read a bad index*
GSM to application	+CMS ERROR: 321	*error : invalid index*
Application to GSM	AT+CMGF=0 ;+CMGR=1	*in PDU mode*
GSM to application	+CMGR: 2,,<length> <CR><LF> <pdu> OK	*Message is stored but unsent,* *no <alpha> field*

9.10. List message   +CMGL

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

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>…)

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Response syntax for PDU mode:

+CMGL : <index>,<stat>, [<alpha>], <length> <CR><LF> <pdu>
   (for **SMS-DELIVER** and **SMS-SUBMIT**,
   may be followed by other <CR><LF>+CMGL:<index>…)

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

PDU mode	Text mode
0	"REC UNREAD" (received unread message)
1	"REC READ" (received read message)
2	"STO UNSENT" (stored unsent message)
3	"STO SENT" (stored sent message)
4	"ALL" (all messages)

Application to GSM	AT+CMGL="REC UNREAD"	*List unread messages in text mode*
GSM to application	+CMGL: 1, "REC UNREAD", "0146290800", <CR><LF> Unread Message! +CMGL: 3, "REC UNREAD", "46290800", <CR><LF> Another Unread Message! OK	*2 messages are unread, these messages will then have their status changed to "REC READ". (+CSDH: 0)*
Application to GSM	AT+CMGL="REC READ"	*List read messages in text mode*
GSM to application	+CMGL: 2, "REC READ", "0146290800", <CR><LF> Keep cool OK	
Application to GSM	AT+CMGL="STO SENT"	*read stored and sent messages*
GSM to application	+CMS ERROR: 322	*No message found*

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9.11. Send message   +CMGS

Command syntax in text mode *:*

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

text is entered   <ctrl-Z / ESC >

Command syntax in PDU mode *:*

AT+CMGS= <length> <CR>

PDU is entered   <ctrl-Z / ESC >

The <address> field is the address of the terminal network to whom the message is sent. To send the message, simply type <ctrl-Z> character (ASCII 26). The text can contain all existing character except <ctrl-Z> and <ESC> (ASCII 27).

This command is abortable using the <ESC> character when entering text.

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

Example of use :

Application to GSM	AT+CMGS="+33146290800"<CR> Please Call me soon, Fred.<ctrl-Z>	*Send a message in text mode*
GSM to application	+CMGS : <mr> OK	*Successful transmission*
Application to GSM	AT+CMGS=<length><CR> <pdu><ctrl-Z>	*Send a message in PDU mode*
GSM to application	+CMGS : <mr> OK	*Successful transmission*

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

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Note : this number is not a storage number - outgoing messages are not stored.

9.12. **Write Message to Memory +CMGW**

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

The entering of text or PDU is done similarly as specified in command Send Message +CMGS.

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

   AT+CMGW= <oa/da> [,<tooa/toda> [,<stat>]] <CR>
                enter text <ctrl-Z / ESC>

Command syntax in PDU mode *:*

   AT+CMGW= <length> [,<stat>] <CR>
                give PDU <ctrl-Z / ESC>

Response syntax: +CMGW: <index>

                or +CMS ERROR: <err> if writing fails

Parameter Definition :

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

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

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

Defined <stat> values :

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

<length> : The length of the actual data unit in octets

Example:

Application to GSM	AT+CMGW="+33146290800"<CR> Hello, how are you ?<ctrl-Z>	*Write a message in text mode*
GSM to application	+CMGW : 4 OK	*Message stored in index 4*
Application to GSM	AT+CMGW=<length><CR> <pdu><ctrl-Z>	*Write a message in PDU mode*
GSM to application	+CMGW : <index> OK	*Message stored in <index>*

9.13. Send Message From Storage   +CMSS

This command sends message with location value <index> from storage to the network.

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

Response syntax: +CMSS : <mr>

or +CMS ERROR: <err> if sending fails

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

Example of use in Text Mode:

Application to GSM	AT+CMGW=0660123456<CR> Today is my birthday<ctrl-Z>	*Write a message in text mode*
GSM to application	+CMGW : 5 OK	*Message stored in index 5*
Application to GSM	AT+CMSS=5	*Send the message 5*
GSM to application	+CMSS : <mr> OK	*Successful Transmission*
Application to GSM	AT+CMSS=5, 0680654321	*Send the message 5 to a different GSM*
GSM to application	+CMSS : <mr> OK	*Successful Transmission*

9.14. Set Text Mode Parameters +CSMP

This command shall be used to select value for the <vp>, <pid>, the <dcs>. The application must send the following command :

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

<fo> byte is composed of 6 differents fields :

b7	b6	B5	b4	b3	b2	b1	b0
RP	*UDHI*	*SRR*	*VPF*		*RD*	*MTI*	

RP : Reply Path, not used in text mode.

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

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

VPF : Validity Period Format

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

b4=1 & b3=0 -> <vp> field is present in relative format

Others formats (absolute & enhanced) are not supported.

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

MTI : Message Type Indicator

b1=0 & b0=0 -> SMS-DELIVER (in the direction SC to MS)

b1=0 & b0=1 -> SMS-SUBMIT (in the direction MS to SC)

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

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

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

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

Application to GSM	AT+CSMP?	*current values*
GSM to application	+CSMP: 0,0,0,0 OK	*no validity period* *<dcs>= PCCP437 alphabet (8 bits -> 7*

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		bits)
Application to GSM	AT+CSMP=17,23,64,244	*<vp> = 23 (2 hours, relative format)* *<dcs> = GSM 8 bits alphabet*
GSM to application	OK	*command correct*

9.15. Delete message +CMGD

This command shall be used after a read-command in order to delete the any stored message.

For example :

GSM to application	+CMTI: "SM",3	*New message received*
Application to GSM	AT+CMGR=3	*Read it*
GSM to application	+CMGR: "REC UNREAD", "0146290800",,"98/10/01,18 :19 :20+0 0" <CR><LF> Received Message! OK	*Unread message* *received from 0146290800* *on the 01/10/1998 at 18H* *19m 20s*
Application to GSM	AT+CMGD=3	*Delete it*
GSM to application	OK	*Message deleted*

9.16. Service center address +CSCA

This command shall be used to indicate to which service center the message has to be sent.

The GSM module 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.

So, the application has to indicate this address at initialization. This address is then valid all the time. The application may change it if needed.

Application to GSM	AT+CMGS="+33146290800"<CR> Hello, how are you ?<ctrl-Z>	*Send a message*
GSM to Application	+CMS ERROR : 330	*Service center unknown*
Application to GSM	AT+CSCA="0696741234"	*Service center initialization*
GSM to application	OK	
Application to GSM	AT+CMGS="+33146290800"<CR>	*Send again the same*

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	Happy Birthday !<ctrl-Z>	*message*
GSM to application :	+CMGS : 1 OK	*Successful transmission*

9.17. Select Cell Broadcast Message Types +CSCB

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

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

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

Test read command (AT+CSCB ?) is not supported.

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

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

Supported languages (<dcss> parameter) are : 0 for German, 1 for English, 2 for Italian, 3 for French, 4 for Spanish, 5 for Dutch, 6 for Swedish, 7 for Danish, 8 for Portugese, 9 for Finnish, 10 for Norwegian, 11 for Greek, 12 for Turkish, 13 for Hungarian, 14 for Polish and 32 for Czech.

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

9.18. Cell Broadcast Message Identifiers +WCBM

Command syntax : AT+WCBM= <mode> [, <mids>, <dcss>]

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

This file is not used with +CSCB command, the application should read this file (AT+WCBM ?) and combine the Message Identifiers with those required for the application.

Application to GSM	AT+WCBM="10,100,1000,10000"	*Write 4 message identifiers in EF-CBMI*
GSM to Application	OK	*CBMIs are stored if EF-CBMI*
Application to GSM	AT+WCBM ?	Read the CBMIs in EF-CBMI
GSM to application	+WCBM="10,100,1000,10000"	4 CBMIs are stored if EF-CBMI

9.19. Message status modification   +WMSC

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

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

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

Possible responses:

OK   if the location is valid

+CMS ERROR: 321   if <loc> is invalid or free

+CMS ERROR: 302   if the new <status> and the previous one are incompatible   (1)

Note 1 : The accepted status changes are from READ to NOT READ and vice versa, and from SENT to NOT SENT and vice versa.

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

9.20. Message overwriting   +WMGO

The +CMGW writes a SMS to the first free location. To write a SMS to a specified location, the +WMGO **specific** command forces the module to write a SMS (with +CMGW command) to the location specified with +WMGO, but just for one +CMGW command.

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Command syntax :   AT+WMGO= <loc>

<loc> location number of the SIM record to write or overwrite

Possible responses:

OK   if <loc> is a valid SMS location, for AT+WMGO=? and for AT+WMGO?

+CMS ERROR: 321   if <loc> is out of the SIM capacity range.

+WMGO: <loc>   for AT+WMGO?

Then on the next AT+CMGW commnand, the used record number will be that one specifed by AT+WMGO command. The location is then forgotten, and to make a second overwrting, the +WMGO shall be used again.

If the external application specifies a free location, and if an incoming message is received before the AT+CMGW command, the module may store the incoming message in a free location, which could be unfortunately the one specified by +WMGO (the module does not prevent this case). Then if the user issues a AT+CMGW command, without changing the AT+WMGO location, the new message will be overwritten !

Be aware that this location number is not kept over a software reset.

10. Supplementary Services commands

10.1. Call forwarding +CCFC

This commands allows control of the call forwarding supplementary service.

Command syntax:

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

Response syntax:

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

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

[…]]

* <reason> :

0	Unconditional
1	Mobile busy
2	No reply (<time> is used)
3	Not reachable
4	All call forwarding
5	All conditionnal call forwarding

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* <mode> :

0	Disable
1	Enable
2	Interrogate
3	Registration
4	Erasure

* <class> :

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

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

* <subaddr>, <satype> : not managed

* <time> : For Call Forwarding on No Reply, time to wait (1 to 30) in seconds before call is forwarded, default value is 20 seconds.

Application to GSM	AT+CCFC=0,3, "0146290800"	*register call forwarding unconditional*
GSM to application	OK	*Command valid*
Application to GSM	AT+CCFC=0,2	*Interrogate call forwarding unconditional*
GSM to application	+CCFC:1,1, "0146290800" ,129 <CR><LF>+CCFC:1,2, "0146290802",129 <CR><LF>+CCFC:1,4, "0146290804" ,129 OK	*call forwarding active for voice* *call forwarding active for data* *call forwarding active for fax*
Application to GSM	AT+CCFC=0,4	*erase call forwarding unconditional*
GSM to application	OK	*Command valid*

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The +CCFC responses are not sorted depending of the <class> parameter, it only depends of the order of the network response.

10.2. Call barring   +CLCK

This commands allows control of the call barring supplementary service.

Locking, unlocking or querying the status of a call barring is possible for all or a specific class.

Command Syntax:

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

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

+CLCK: <status> [, <class1>

[<CR><LF>+CLCK: <status>, <class2>

[…]]

* <fac> :

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

"AI", "IR"   for incoming calls barring

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

*<mode>

0	unlocks the facility
1	locks the facility
2	query status

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* <class> : see description for +CLCK command (Call Barring)

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

Password code must be on 4 digits maximum.

Application to GSM	AT+CLCK="AO",1,1234	
GSM to application	OK	*Command valid*
Application to GSM	AT+CLCK="AO",0,5555	
GSM to application	+CME ERROR: 16	*Wrong password*
Application to GSM	AT+CLCK="AO",0,1234	
GSM to application	OK	*Command valid*

10.3. Modify SS password +CPWD

This command shall be used by the application to change the supplementary service password. The command to manage this functionality is :

Command Syntax:

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

for <fac> see +CLCK command with only "P2" facility added (SIM PIN2).

Application to GSM	AT+CPWD="AO",1234,5555	*change Call Barring password*
GSM to application	OK	*password changed*
Application to GSM	AT+CPWD="AO",1234,5555	*Change password*
GSM to application	+CME ERROR: 16	*wrong password*
Application to GSM	AT+CPWD="AO",5555,1234	*change password*
GSM to application	OK	*password changed*

Whatever the facility, the change of password is performed for all calls barring.

10.4. Call waiting   +CCWA

This command allows control of the call waiting supplementary service.

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The module will send an unsolicited result code +CCWA when call waiting service is enabled.

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

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

    +CCWA: <status> [, <class1>

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

    […]]

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

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

0	Disable
1	Enable

* <mode> :

0	Disable
1	Enable
2	Query status

* <class> :

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

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

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

Application to GSM	AT+CCWA=1,1,1	*Enable call waiting for speech*
GSM to application	OK	*Command valid*
Application to GSM	AT+CCWA=1,2	*Interrogate call waiting*
GSM to application	+CCWA:1,1 OK	*Call waiting active for speech calls*
Application to GSM	+CCWA:"0146290800",145,1, "FREDDY"	*Number and name of the waiting voice call*
Application to GSM	AT+CCWA=1,0,7	*erase call waiting for all classes*
GSM to application	OK	*command valid*
Application to GSM	+CCWA: ,,1	*Waiting voice call without number*

10.5. Calling line identification restriction +CLIR

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

<u>Command syntax:</u>   AT+CLIR=<n>

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

- <n> : parameter sets the adjustment for outgoing calls

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

* <m> : parameter shows the subscriber CLIR status in the network

0	CLIR not provisioned
1	CLIR provisioned in permanent mode

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2	Unknown (no network...)
3	CLIR temporary mode presentation restricted
4	CLIR temporary mode presentation allowed

Application to GSM	AT+CLIR=2	
GSM to application	OK	*command valid*
Application to GSM	AT+CLIR?	*Ask for current functionality*
GSM to application	+CLIR: <n>,<y> OK	*<n> and <m> defined as above*

10.6. Calling line identification presentation   +CLIP

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

Command syntax:

AT+CLIP=<n>

Response syntax:

+CLIP: <n>,<m>   for AT+CLIP?

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

for an incoming call, after each RING or +CRING indication

* <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

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| | 2 | Unknown (no network...) | |

Application to GSM	AT+CLIP=1	*Enable CLIP*
GSM to application	OK	*CLIP is enabled*
Application to GSM	AT+CLIP?	*Ask for current functionality*
GSM to application	+CLIP: <n>,<m> OK	*<n> and <m> defined as above*
GSM to application	RING +CLIP: "0146290800",129,1,,, "FRED"	*Incoming call* *Incoming call with number and name presentation*
Application to GSM	AT+CLIP=0	*Disable CLIP presentation*
GSM to application	OK	*Command valid*

10.7. Connected line identification presentation   +COLP

This command allows control of the connected line identification presentation supplementary service, useful in case of call forwarding of the connected line.

Command syntax:

   AT+COLP=<n>

Response syntax:

   +COLP: <n>,<m>   for AT+COLP?

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

        after ATD command, before OK or CONNECT <speed>

   <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

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0	COLP not provisioned
1	COLP provisioned
2	Unknown (no network...)

Application to GSM	AT+COLP=1	*Activate COLP*
GSM to application	OK	*Command valid*
Application to GSM	AT+COLP?	*Ask for current functionality*
GSM to application	+COLP: 1,1 OK	*COLP is enabled and provisioned*
Application to GSM	ATD146290800;	*Outgoing call*
GSM to application	+COLP: "0146290928",129,,,"JOE" OK	*Connected outgoing line number and name presentation*
Application to GSM	AT+COLP=0	*desactivate COLP*
GSM to application	OK	*command valid*

10.8. Advice of charge +CAOC

<u>Command syntax:</u>   AT+CAOC= <mode>

This refers to Advice of Charge supplementary service (GSM 02.24 [] and GSM 02.86 []) that enables subscriber to get information about the cost of calls. With <mode>=0, the execute command returns the current call meter value (CCM) from the ME.

If AOC is supported, the command also includes the possibility to enable an unsolicited event reporting of the CCM information.

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

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

Defined values

<mode>:

0   query CCM value
1   deactivate the unsolicited reporting of CCM value

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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" indicates decimal value 30); value is in home units and bytes are similarly coded as ACMmax value in the SIM

Application to GSM	AT+CAOC=0	*Query CCM value*
GSM to application	+CAOC : "000A08" OK	*Display Current Call Meter value (CCM = 2568)*
Application to GSM	AT+CAOC=1	*Deactivate unsolicited report of CCM value*
GSM to application	OK	*CCM report deactivated*
Application to GSM	AT+CAOC=2	*Activate unsolicited report of CCM value*
GSM to application	OK	*CCM report activated*
Application to GSM	AT+CAOC ?	*Request mode*
GSM to application	+CAOC : <mode> OK	*Display unsolicited report mode (1 or 2)*
Application to GSM	AT+CAOC= ?	*Request supported modes*
GSM to application	+CAOC : (0-2) OK	*0,1,2 modes supported*

10.9. Accumulated call meter +CACM

Set command resets the Advice of Charge related accumulated call meter value in SIM file EF$_{ACM}$. 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.

Read command returns the current value of ACM.

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

Application to GSM	AT+CACM ?	*Request ACM value*
GSM to application	+CACM : "000400"	*Display ACM value*

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	OK	*(ACM = 1024)*
Application to GSM	AT+CACM= 1234	*Request ACM reset, real PIN2 is* "1234"
GSM to application	OK	*ACM value is reset*
Application to GSM	AT+CACM= 0000	*Request ACM reset with wrong PIN2 value*
GSM to application	+CME ERROR : 17	*SIM PIN2 required*
Application to GSM	AT+CACM ?	*Request ACM value*
GSM to application	+CACM : "000000" OK	*Display ACM value* *(ACM = 0)*

10.10. Accumulated call meter maximum +CAMM

Set command sets the Advice of Charge related accumulated call meter maximum value in SIM file EF$_{ACMmax}$. ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. When ACM (refer +CACM) reaches ACMmax, then calls are prohibited. SIM PIN2 is required to set the value. If setting fails in an ME error, +CME ERROR: <err> is returned.

Read command returns the current value of ACMmax.

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

Application to GSM	AT+CAMM= "000400", 1234	*Request ACMmax update, real PIN2 is* "1234"
GSM to application	OK	*ACMmax updated to 1024*
Application to GSM	AT+CAMM= "000400",0000	*Request ACMmax update, real PIN2 is* "1234"
GSM to application	+CME ERROR : 17	*SIM PIN2 required*
Application to GSM	AT+CAMM ?	*Request ACMmax value*
GSM to application	+CAMM : "000400" OK	*ACMmax=1024*

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10.11. Price per unit and currency table +CPUC

Description

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

Application to GSM	AT+CPUC= "FFR", "0.82", 1234	*Request Currency and Price per unit update*
GSM to application	OK	
Application to GSM	AT+CPUC= "FFR", "0.82", 1111	*Request Currency and PPU update (wrong PIN2)*
GSM to application	+CME ERROR : 17	*SIM PIN2 required*
Application to GSM	AT+CPUC?	*Request Currency & Price*
GSM to application	+CPUC: "FFR", "0.82" OK	*Currency= "FFR"* Price per unit= "0.82"

10.12. Call related supplementary services +CHLD

This command is used to manage call hold and multiparty conversation (conference call).

Calls can be put on hold, recovered, released or added to conversation.

Command syntax: AT+CHLD= < n >

Response syntax: +CHLD: (0-3, 11-17, 21-27) for AT+CHLD=?

<n>   0   Release all held calls or set User Determined User Busy

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(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

10.13. List current calls +CLCC

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

Command syntax:

AT+CLCC

Response syntax:

OK   if no calls are available

+CLCC: <id1>, <dir>, <stat>, <mode>, <mpty>

[,<number>, <type> [<alpha>]]

[<CR><LF> +CLCC: <id2>, <dir>, <stat>, <mode>, <mpty>

[,<number>, <type> [<alpha>]]

[. . .]]]

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

<dir>:
- 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>:
- 0   call is not one of multiparty (conference) call parties
- 1   call is one of multiparty (conference) call parties

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

<type>: type of address octet in integer format

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

    corresponding to the entry found in phonebook.

10.14. Supplementary service notifications +CSSN

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

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This command refers to supplementary service related network initiated notifications.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code **+CSSI:<code1>** 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>** is sent.

Command syntax:

   AT+CSSN= <n>, <m>

Response syntax:

   +CSSN: <n>, <m>   for AT+CSSN?

   +CSSN: (0-1), (0-1)   for AT+CSSN=?

Defined values

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

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

<code1>
   5   outgoing calls are barred
   6   incoming calls are barred
   7   CLIR suppresssion rejected

<code2>
   2   call has been put on hold (during a voice call)
   3   call has been retrieved (during a voice call)
   4   multiparty call entered (during a voice call)
   5   call on hold has been released (during a voice call)

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10.15. Unstructured supplementary service data +CUSD

The USSD supplementary service is described by the GSM 02.90.

It is based on digit sequences which may be entered by mobile user with an handset. An entered sequence is sent to the network which answers back with a alphanumerical string, only for display, or to display and to ask for a next sequence.

This command is used for :

- enabling or disabling the CUSD indication sent to the application by the module when a incomming USSD is received

- send and receive USSD strings.

For the first behavior, the syntax is :

Command syntax:

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

<n>

0 : Disable the result code presentation

1 : Enable the result code presentation

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

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

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

- <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)

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2	USSD terminated by network
4	Operation not supported

- <str> is network string, converted in the selected character set (HEX mode is not supported).

- <dcs> is the data coding sheme received (GSM TS 03.38).

To send and receive USSD

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

Note : Please, be aware that the send command asks the user to re-enter the enable/disable (<n>) parameter !

<str> is the USSD string to be sent.

<dcs> : only the default alphabet value is supported (which is the default value when the parameter is absent).

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

10.16.Closed user group +CCUG

The Closed User Group Supplementary Service enables subscribers to form closed user groups to and from which access is restricted.

The CUG supplementary service is described by the GSM 02.85. This service shall be provided after prior arrangement with the service provider. At provision subscription options should be selected.

+CCUG command is used for :

- activating/deactivating the control of the CUG information for all following outgoing calls.

- selecting a CUG index,

- suppressing the outgoing access (OA). The OA allows a member of a CUG to place calls outside the CUG.

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- suppressing the preferential CUG. The preferential is the default CUG used by the network when it does not receive explicit CUG index.

Command syntax:

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

<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

For activating the control of the CUG information by call, add [G] or [g] to the ATD command. Index and info values will be used.

11. Data commands

11.1. Bearer type selection +CBST

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

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

<speed>	Description	Modem type
0 (default)	Autobauding	None
1	300 bps	V.21
2	1200 bps	V.22
3	1200/75 bps	V.23
4	2400 bps	V.22bis
5	2400 bps	V.26ter
6	4800 bps	V.32
7	9600 bps	V.32
8	Specific	
65	300 bps	V.110
66	1200 bps	V.110
68	2400 bps	V.110
70	4800 bps	V.110
71	9600 bps	V.110

<ce>	Connection element
0	Transparent only
1(default)	Non transparent only
2	Transparent preferred
3	Non transparent preferred

Application to GSM	AT+CBST=7,0,1	*ask for a bearer*
GSM to application	OK	*bearer supported*
Application to GSM	AT+CBST=81,0,0	*ask for a bearer*

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GSM to application	+CME ERROR : 3	*bearer not supported*

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

Note 1) as far as incoming calls are concerned, if <ce> is set to T only and the network proposes NT only or vice versa then the call is released.

Note 2) older values 100 and 101 for <ce> are retained for compatibility purpose but shallnot be used anymore, values 2 and 3 shall be used instead.

11.2. Select mode   +FCLASS

This command puts the module into a particular mode of operation (data or fax).

Command syntax: AT+FCLASS= <n>

<n>	Description
0	Data
1	Fax class 1

Application to GSM	AT+FCLASS=?	*Test command*
GSM to application	+FCLASS: (0,1) OK	*Done*
Application to GSM	AT+FCLASS=0	*Data mode asked*
GSM to application	OK	*Command valid*
Application to GSM	AT+FCLASS=1	*Fax class 1 mode asked*
GSM to application	OK	*Command valid*
Application to GSM	AT+FCLASS?	*Current value*
GSM to application	+FCLASS: 1 OK	*Command valid*

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11.3. Service reporting control   +CR

This command enables a more detailed service reporting, in case of data **incoming or outgoing call**. Before sending the CONNECT response to the application, the GSM module will precise the type of data connection that have been established.

These report types are :

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

Application to GSM	AT+CR=0	*Extended reports disabled*
GSM to application	OK	*Command valid*
Application to GSM	AT+CR=1	*Extended reports enabled*
GSM to application	OK	*Command valid*

11.4. Cellular result codes +CRC

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

Application to GSM	AT+CRC=0	*Extended reports disabled*
GSM to application	OK	*Command valid*
Application to GSM	AT+CRC=1	*Extended reports enabled*
GSM to application	OK	*Command valid*

11.5. DTE-DCE local rate reporting +ILRR

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

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

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

Application to GSM	AT+ILRR=0	*Local port rate report disabled*
GSM to application	OK	*Command valid*
Application to GSM	AT+ILRR=1	*Local port rate report enabled*
GSM to application	OK	*Command valid*

11.6. Radio link protocol parameters +CRLP

This command allows to change the radio link protocol parameters used for **non transparent data transmission**.

Command syntax:

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

This command accepts 5 parameters.

<iws>: (0-61)   Down window size, (default is 61),

<mws>: (0-61)   Up window size, (default is 61),

<T1> : (40-255) Acknowledgement timer in units of 10ms, (default is 48),

<N2>: (1-255)   Retransmission attempts, (default is 6),

 <ver>: (0)   Version number. Only 0 is supported.

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Application to GSM	AT+CRLP=?	*Test command*
GSM to application	+CRLP: (0-61),(0-61),(40-255),(1,255),(0) OK	*Done.*
Application to GSM	AT+CRLP=61,61,48,6,0	*Set new parameters*
GSM to application	OK	*Command valid*
Application to GSM	AT+CRLP?	*Current values*
GSM to application	AT+CRLP: 61,61,48,6,0 OK	*Command valid*

11.7. Others radio link parameters   +DOPT

This Wavecom specific command allows to change some supplementary radio link protocol parameters

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

<reset_allowed>	Description
0	Data communication is hung up in case of bad radio link.
1 (default)	Data communication goes on in case of bad radio link (**possible loose of data)**

The second parameter is reserved for future use.

Application to GSM	AT+DOPT=?	*Test command*
GSM to application	(0,1),(0) OK	
Application to GSM	AT+DOPT=1	*Set new parameters*
GSM to application	OK	*Command valid*
Application to GSM	AT+DOPT?	*Current values*
GSM to application	1,0 OK	*Command valid*

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12. Fax commands

The fax service provided by the module is class 1 compatible. However only the core commands defined by ITU T.31 are supported. It means that commands like AT+FAR, +FCC,... are not supported.

Autobauding has to be enabled to set up the module for fax.

All set commands below return an ERROR response code if they are not issued during the communication.

12.1. Transmit speed +FTM

This command sets the fax transmit speed.

Command syntax: AT+FTM=<speed>

<speed>	Description	Modem type
24	2400 bps	V.27ter
48	4800 bps	V.27ter
72	7200 bps	V.29
96	9600 bps	V.29

Application to GSM	AT+FTM=?	*Test command*
GSM to application	(24,48,72,96) OK	*Done*

12.2. Receive speed +FRM

This command sets the fax receive speed.

Command syntax: AT+FRM=<speed>

The speeds are the same as these of +FTM command.

Application to GSM	AT+FRM=?	*Test command*

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GSM to application	(24,48,72,96) OK	*Done*

12.3. HDLC transmit speed +FTH

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

Command syntax: AT+FTH=<speed>

<speed> can only take 3 value which corresponds to V.21 channels 300 bps.

Application to GSM	AT+FTH=?	*Test command*
GSM to application	(3) OK	

12.4. HDLC receive speed +FRH

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

Command syntax: AT+FRH=<speed>

<speed> can only take 3 value which corresponds to V.21 channels 300 bps.

Application to GSM	AT+FRH=?	*Test command*
GSM to application	(3) OK	

12.5. Stop transmission and wait +FTS

This command stops the transmission for the specified period.

Command syntax: AT+FTS=<n>

<n>: silence period (units of 10 ms).

Application to GSM	AT+FTS=?	*Test command*
GSM to application	(0-255) OK	
Application to GSM	AT+FTS=50	*Stops transmission and waits*

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		0.5 s
GSM to application	OK	Command valid

12.6. Receive silence +FRS

This command causes the modem to report back to the DTE after the specified period.

It is aborted if any character is received.

Command syntax: AT+FRS=<n>

<n>is in units of 10 ms.

Application to GSM	AT+FRS=?	Test command
GSM to application	(0-255) OK	
Application to GSM	AT+FRS=50	Waits for 0.5 s silence
GSM to application	OK	Command valid

12.7. 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 be also selected.

♦ Init: default string is suitable for the module

♦ Reset: default string is suitable for the module

♦ Maximum Transmit Rate: 9600 baud (if higher then rate will be automatically cut back to 9600 baud).

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

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13. V24-V25 commands

13.1. Fixed DTE rate +IPR

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

Application to GSM	AT+IPR?	
GSM to application	+IPR: 9600 OK	*current rate is 9600 bps*
Application to GSM	AT+IPR=?	
GSM to application	+IPR:(0,2400, 4800, 9600, 19200) , (300,600,1200,38400,57600,115200) OK	*possible values (1)*
Application to GSM	AT+IPR=38400	
GSM to application	OK	*disable autobauding and set rate to 38400 bps*
Application to GSM	AT+IPR=0	
GSM to application	OK	*enable autobauding*

Note (1) : first set of values indicates the range of autodetectable speeds. The second set of values indicates all the possible speeds which can be used by DCE.

An autobauding is provided which operates from 2400 to 19200 baud. However some constraints have to be dealt with :

- any AT command issued by DTE must start with a capital 'A' and 'T' (or '\'). If not, DCE may send back some garbagge characters and get de-synchronized. Shoud it happen, DTE shall just issue once or twice 'AT\r' (at 2400 or 4800 baud) or just 'AT' (at 9600 baud) to get the modem re-synchronized.

- the DTE shall wait for 1ms after receipt of 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. Shoud this delay ignored, DCE can get de-synchronised. Once again, sending once or twice 'AT\r' or just 'AT' causes the DCE to recover.

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Be careful : at start-up if autobauding is enabled and no AT command has been received yet, the module sends all unsolicited responses (like RING) at 9600 baud.

13.2. DTE-DCE character framing   +ICF

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

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

* <format> :

0	Autodetect	not supported
1	8 Data 2 Stop	supported
2	8 Data 1 Parity 1 Stop	supported
3	8 Data 1 Stop	supported
4	7 Data 2 Stop	supported
5	7 Data 1 Parity 1 Stop	supported
6	7 Data 1 Stop	supported

* <parity> :

0	Odd	supported
1	Even	supported
2	Mark	supported
3	Space	supported
4	None	supported

Note 1) setting a character framing different from 8N1 will disable autobauding (in the case it was activated). However setting it back to 8N1 will not re-enable autobaud.

Note 2) setting the framing to 8N1 will let the autobauding enabled, if it was already enabled (implying framing was already 8N1).

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Application to GSM	AT+ICF?	
GSM to application	+ICF: 3,4 OK	*current values*
Application to GSM	AT+ICF=?	
GSM to application	+ICF: (1-6),(0-4) OK	*possible values.*
Application to GSM	AT+ICF=0,0	
GSM to application	OK	*new values*

13.3. DTE-DCE local flow control   +IFC

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

AT+IFC=<DCE_by_DTE>,<DTE_by_DCE>

* < DCE_by_DTE > :

0	none	Supported
1	Xon/Xoff local circuit 103	not supported
2	RTS	Supported
3	Xon/Xoff global on circuit 103	not supported

Important note : when this parameter is set to 2 (DTE invokes flow control through RTS) the behavior of the DCE is the following :

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

As soon as DCE detects RTS high, then this signal acts upon it. Therefore subsequent RTS transition to OFF will prevent DCE from sending any further data in online and in offline as well.

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

* < DTE_by_DCE > :

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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.

Application to GSM	AT+IFC?	
GSM to application	+IFC: 2,2 OK	*current values*
Application to GSM	AT+IFC=?	
GSM to application	+IFC: (0,2),(0,2) OK	*possible values.*
Application to GSM	AT+IFC=0,0	
GSM to application	OK	*new values*

13.4. Set DCD signal &C

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

Application to GSM	AT&C0	*DCD always on*
GSM to application	OK	*command valid*
Application to GSM	AT&C1	*DCD matches state of the remote modem's data carrier*
GSM to application	OK	*command valid*

13.5. Set DTR signal &D

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

Application to GSM	AT&D0	*the DTR signal is ignored*
GSM to application	OK	*command valid*
Application to GSM	AT&D1	*Modem switches from data to command mode when DTR switches from ON to OFF*
GSM to application	OK	*command valid*
Application to GSM	AT&D2	*Upon DTR switch from ON to OFF, the call is cleardown*
GSM to application	OK	*command valid*

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13.6. Set DSR signal &S

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

Application to GSM	AT&S0	*DSR always on*
GSM to application	OK	*command valid*
Application to GSM	AT&S1	*DSR off in command mode, DSR on in data mode*
GSM to application	OK	*command valid*

13.7. Back to online mode O

If you have established a connection and the mobile is in online command mode, this command allows to return to online data mode.

Application to GSM	ATO	
GSM to application	OK	*Command valid*

13.8. Result code suppression Q

Determines whether the mobile sends result codes or not

Application to GSM	ATQ0	*DCE transmits result codes*
GSM to application	OK	*Command valid*
Application to GSM	ATQ1	*Result codes are suppressed and not transmitted*
GSM to application	(none)	*no response*

13.9. DCE response format V

Determines the DCE response format, with or without header characters <CR><LF>, and with the use of numeric result codes.

	V0	V1
Information responses	<text><CR><LF>	*<CR><LF>* *<text><CR><LF>*
Result codes	<numeric code><CR>	*<CR><LF>* *<verbose code><CR><LF>*

Application to GSM	ATV0	*DCE transmits limited headers and trailers and*

		numeric result codes
GSM to application	0	*command is valid (0 means OK)*
Application to GSM	ATV1	*DCE transmits full headers and trailers and verbose response text*
GSM to application	OK	*command is valid*

13.10.Default configuration Z

Restores the configuration profile. Any call is released.

Application to GSM	ATZ	
GSM to application	OK	*Command valid*

13.11.Save configuration   &W

This commands writes the active configuration to a non-volatile memory (EEPROM). Description of the stored parameters is in appendice 16.10

Application to GSM	AT&W	*Writes current configuration to EEPROM*
GSM to application	OK	*command valid*

13.12.Auto-tests   &T

AT&T0 is used to perform 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.

AT&T1 is used to close the audio loop, and **AT&T2** is used to open the audio loop. This is used to validate the audio loop (microphone to speaker).

Application to GSM	AT&T0	*Perform software auto-tests*
GSM to application	OK	*No software problem detected, all checksums are correct*
Application to GSM	AT&T1	*Do the audio loop test (close)*
GSM to application	OK	*command valid*
Application to GSM	AT&T2	*Stop the audio loop test (open)*
GSM to application	OK	*command valid*

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13.13.Echo E

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

Application to GSM	ATE0	*Characters are not echoed*
GSM to application	OK	*Done*
Application to GSM	ATE1	*Characters are echoed*
GSM to application	OK	*Done*

13.14.Restore factory settings   &F

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

The settings which are restored are listed in appendice 16.10.

Application to GSM	AT&F	*Ask for restoring the factory settings*
GSM to application	OK	*Done*
Application to GSM	AT&F0	*Ask for restoring the factory settings*
GSM to application	OK	*Done*

13.15.Display configuration &V

This command is used to display modem configuration

&V0   **:** Display the modem configuration in RAM.

&V1   **:** Display the modem configuration in EEPROM.

&V2   **:** Display the factory modem configuration.

The parameters which are displayed are the following:

Q, V, S0, S2, S3, S4, S5, +CR, +CRC, +CMEE, +CBST, +SPEAKER,+ECHO

Application to GSM	AT&V0	*RAM modem parameters*
GSM to application	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	*Done*

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	OK	

13.16.Request identification information I

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

I0 : Display the manufacturer followed by model identifications. This command is equivalent to +CGMI and +CGMM.

I3 : Display the revision identification (equivalent to +CGMR).

I4 : Display the modem configuration in RAM (equivalent to &V0).

I5 : Display the modem configuration in EEPROM (equivalent to &V1).

I6 : Display the modem data features. This command enumerates the supported data rates, data modes, and fax classes.

I7 : Display the modem voice features.

If the value is different, an "OK" string will be sent back.

Application to GSM	ATI0	*Manufacturer and model identifications*
GSM to application	WAVECOM MODEM 900P OK	*GSM 900 MHz primary band*
Application to GSM	ATI3	*Revision identification*
GSM to application	310_G250.51 806216 032199 17:04 OK	*Software release 3.10 ,révision 51 generated on the 21st of March 1999*
Application to GSM	ATI6	*Modem data features*
GSM to application	DATA RATES: AUTOBAUD,300,1200,1200/75,2400,4800,9600 DATA MODES: T/NT,ASYNCHRONOUS FAX CLASS 1 OK	*Done*
Application to GSM	ATI7	*Modem voice features*

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| GSM to application | SPEECH CODINGS: FR,EFR
OK | *Done* |

14. Specific AT commands

14.1. Cell environment description   +CCED

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

Two ways may exist for the external application to know these cell parameters : on request of the application, or automatically by the module every 5 seconds.

The automatic mode is not supported during communication or registration.

The command to manage this functionality is :

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

* <mode> :

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

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* <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

Combination (addition of the values) of the requested dumped are supported.

Notice that in idle mode, only RxLev measures (one the main cell and on the neighbour cells) are done. The value of these RxLev is set in the RxLev Full field for the main cell.

The response will be :

> +CCED :<value>, ... , <value>
> OK

Where <value> is the ASCII string of the values (in decimal except LAC and CI values are in hexadecimal) of the parameters. If a field can not be measured - or has no sense - the parameter is not filled (two consecutive commas are then found).

If the <requested dump> parameter is absent, this of the last +CCED command (or 15 by default) will be taken.

Values of MCC/MNC are set to 0 in case of "No service"

14.2. Automatic RxLev indication   +CCED

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

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

* <mode> :

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

* <requested dump> :

8	Main cell RSSI indications (RxLev) from 0 to 31

The response will be a +CSQ answer and not a +CCED answer. The 07.07 format for the +CSQ is respected. The <ber> is not evaluated by this command, so the <ber> value will always be 99.

+CSQ :<rssi>, 99
OK

This +CSQ answer, when automatic shots are selected, is sent every time the <rssi> measured by the module changes. This automatic shots are supported in idle mode and during communication.

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Combination (addition of the values) of the requested dumped (1,2,4,8) are supported. Both answer +CCED and +CSQ may be then generated.

If the <requested dump> parameter is absent, this of the last +CCED command (or 15 by default) will be taken.

14.3. General Indications   +WIND

Wavecom introduced a general mechanism to send unsollicited non standardized indication to the customer application. The yet identified unsollicited non standardized indications are :

- indication of a physical change on the SIM presence pin from connector (meaning SIM inserted, SIM removed)

- indication during a mobile originated call establishement, that the calling party is ringing.

- Indication of the availability of the module, after boot, to receive AT commands

For each of these indications, a "bit flow" has to be indicated. The syntax of the command is :

Command syntax: AT+WIND= <IndLevel >

<IndLevel>	Indication
1 (bit-0)	Hardware SIM Insert / Remove indications (Rack open/close)
2 (bit-1)	Calling party alert indication
4 (bit-2)	Module is ready to treat AT commands (except phonebooks, AOC, SMS), but still in emergency mode.
8 (bit-3)	Indication that the module is ready to treat all AT commands, at te end of init, or after ADN / FDN swap
16 (bit-4)	Indication that a new call identifier has been created (after an ATD command, +CCWA indication)

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32 (bit-5)	Indication that an active, held or waiting call has been released,

If <IndLevel> is equal to 0 (default value), no unsolicited
"+WIND: <IndNb>" will occur.

Combination (addition of the values) shall be used to allow more than one indication flow.

0 ≤ IndLevel ≤ 63

The answer is OK if the value are in the previous range.

The unsolicited answer will then be :

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

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

The supported events are:

<event>	Meaning
0	The SIM presence pin has been detected as "SIM removed" (depending from the 0 bit flow)
1	The SIM presence pin has been detected as "SIM inserted"
2	Calling party is alerting
3	Module is ready to treat AT commands (except phonebooks, AOC, SMS), at init or after AT+CFUN=1
4	Module is ready to treat all AT commands, end of phonebook init or swap (FDN to ADN)
5	Call <idx> has been created (after ATD, RING or +CCWA…)
6	Call <idx> has been released, after a NO CARRIER, a +CSSU: 5 indication, or after the release of a call waiting

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AT+WIND? Command is supported and indicates the <allowed bit flows>. AT+WIND is automatically stored in e2p. This means the &W commands has not to be used. And the selected flows are always activated after boot.

Default value is 0 : No flow activated. No indication.

AT+WIND=? Indicates the posibbles values. (0-63)

14.4. Data ciphering mode between ME and MSC   +ALEA

This command is used to get a random value from the mobile station and to reenter it codes by the DES algorithm. In the way Application to GSM, an "h" character shall be added before the value.

Application to GSM	AT+ALEA?	get random value
GSM to Application	AT+ALEA=1234567890123456 OK	command valid
Application to GSM	AT+ALEA=hA125B348ABCDEF9	value coded
GSM to Application	+ALEA=9876543210FBCADE0 OK	value coded valid new random value sent
Application to GSM	AT+ALEA=h12335678902234AB	new coded value
GSM to Application	NO CARRIER	coded value false communication hang up

14.5. Data ciphering mode +CRYPT

This command enables or disables the data ciphering (D.E.S algorithm) of the PIN and a random value sent periodically in order to insure a more secure communication.

Application to GSM	AT+CRYPT=0	Ciphering off
GSM to Application	OK	command valid
Application to GSM	AT+CRYPT=1	Ciphering on
GSM to Application	OK	command valid

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14.6. Key management   +EXPKEY

This command is used to enter the key used in the D.E.S algorithm to cipher the data (PIN). In the way Application to GSM, an "h" character shall be added before the value.

Application to GSM	AT+EXPKEY?	*Is a key stored in EEPROM?*
GSM to Application	+EXPKEY: NO KEY	*key is absent*
Application to GSM	AT+EXPKEY=h011101110110111	*new key entered*
GSM to Application	OK	*command valid*
Application to GSM	AT+EXPKEY?	*Is a key stored in EEPROM?*
GSM to Application	+EXPKEY: READY	*key is present*

14.7. Informations on PLMN   +CPLMN

This command returns the status and the number of all PLMNs seen by the mobile. It also indicates the BCCH frequency number (absolute) of the strongest cell and its RxLev

Application to GSM	AT+CPLMN=?	
GSM to application	+CPLMN: (2,20810,122,50), (0,20801,64,53) OK	*as defined as AT+COPS=? in the GSM TS 07 07*

14.8. Analog digital converters measurements   +ADC

This command allows to get the DC level of ADC A and ADC B (those voltages are coded on 8 bits, see hardware specifications). Those values are updated every 10 seconds.

Application to GSM	AT+ADC?	
GSM to application	+ADC: 5,4 OK	ADC A , ADC B

14.9. Mobile Equipment event reporting   +CMER

This command enabled or disables sending of unsolicited result codes in the case of key pressing.

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

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<keyp> (keypad) :

0	No keypad event reporting.
1	Keypad event reporting are routed using unsolicited code : +CKEV : <key>, <press>

<press>
   1: key press
   0: key release

<key> : Keyboard map is (5,5)

0	1	2	3	4
5	6	7	8	9
10	11	12	13	14
15	16	17	18	19
20	21	22	23	24

14.10. Read Language Preference   +WLPR

Command syntax: AT+WLPR= <index >

Response syntax: +WLPR: <value>

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

Application to GSM	AT+WLPR?	Read command
GSM to application	+WLPR: 4 OK	Four language preference are available in EF-LP
Application to GSM	AT+WLPR=1	*Read first EF-LP index value*
GSM to application	+WLPR: 5 OK	Language preference is 5

14.11. Write Language Preference   +WLPW

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

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

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Write a Language Preference value in EF-LP

Application to GSM	AT+WLPW=1,5	*Write Lang Pref equal to 5 in EF-LP with index 1*
GSM to application	OK	EF-LP correctly updated

14.12. Read GPIO value   +WIOR

Command syntax: AT+WIOR=<index >

Response syntax: +WIOR: <value>

Set the I/O port as an input and read the I/O pin, 0 if the pin is reset, 1 if the pin is set. Eight I/O ports are available, so the <index> value is between 0 and 7.

Application to GSM	AT+WIOR=4	*Read I/O (number 4) value*
GSM to application	+WIOR: 0 OK	GPIO number 4 is reset

14.13. Write GPIO value   +WIOW

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

Response syntax: OK

Set the I/O port as an output with a I/O pin value, 0 for reset, 1 for set

Application to GSM	AT+WIOW=4,0	*Reset I/O (number 4)*
GSM to application	OK	GPIO value is written

14.14. Abort command   +WAC

This **specific** command allows to abort SMS, SS and PLMN selection.

Command syntax:

Command	Return

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AT+WAC	
AT+WAC=?	OK
AT+WAC?	OK

Example:

Application to GSM	AT+COPS=?	*PLMN Selection.*
Application to GSM	AT+WAC	*Abort the ask of PLMN list*
GSM to application	OK	

14.15.Play tone +WTONE

This **specific** command allows to play a tone on the current speaker or on the buzzer. The frequency, gain and duration can be settled.

Command syntax:

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

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

<mode>:
   0: Stop playing.
   1: Play a tone

<dest>
   This parameter settles the destination (mandatory if <mode>=1)
   1: Speaker
   2: Buzzer

<freq>
   This parameter settles the frequency (in Hz) of the tone (mandatory if <mode>=1).
   If <dest> is the speaker, the range is between 1Hz and 3999Hz. If <dest> is the buzzer, the range is between 1Hz and 50000Hz.

<gain> (0-15)
   This parameter settles the gain of the tone. By default, the value is 9.

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

<duration> (0-255)

This parameter settles the duration of the tone (unit of 20 ms). When this parameter is equal to 0 (default value), the duration is infinite, and the tone can be stopped by AT+WTONE=0.

Application to GSM	AT+WTONE=1,1,330,9,100	*Play a tone*
GSM to application	OK	*Done*
Application to GSM	AT+WTONE=0	*Stop playing*
GSM to application	OK	*Done*
Application to GSM	AT+WTONE=?	*Test command*
GSM to application	OK	*Done*
Application to GSM	AT+WTONE?	*Current value*
GSM to application	ERROR	

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14.16.Play DTMF tone   +WDTMF

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

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

Command syntax:

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

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

<mode>:
   0: Stop playing.
   1: Play a DTMF tone

<dtmf>
   This parameter settles the DTMF to play in {0-9,*,#,A,B,C,D} (mandatory if <mode>=1)

<gain> (0-15)
   This parameter settles the gain of the tone. The values are the same as these of +WTONE (speaker) command. By default, the value is 9.

<duration> (0-255)
   This parameter settles the duration of the tone (unit of 20 ms). When this parameter is equal to 0 (default value), the duration is infinite, and the DTMF tone can be stopped by AT+WDTMF=0.

Application to GSM	AT+WDTMF=1,"*",9,100	*Play a DTMF tone*
GSM to application	OK	*Done*
Application to GSM	AT+WDTMF=0	*Stop playing*
GSM to application	OK	*Done*
Application to GSM	AT+WDTMF=?	*Test command*
GSM to application	+WDTMF: (0-1),(0-9,*,#,A,B,C,D),(0-15),(0-255) OK	*Done*
Application to GSM	AT+WDTMF?	*Current value*
GSM to application	ERROR	

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15. Other AT commands

15.1. V.25 ter recommandation

Other remaining basic commands are not implemented, so an "ERROR" string will be sent back.

All commands about modulation control, error control and data compression are not recognized. An "ERROR" string will be sent back.

15.2. GSM 07.05 recommandation

All the remaining commands are not implemented, so an "ERROR" string will be sent back.

15.3. GSM 07.07 recommandation

All the remaining commands are not implemented, so an "ERROR" string will be sent back.

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16. Appendices

16.1. ME error result code : +CME ERROR: <error>

<error>	Meaning	Resulting from the following commands
3	Operation not allowed	All GSM 07.07 commands (+CME ERROR: 3)
4	Operation not supported	All GSM 07.07 commands (+CME ERROR: 4)
5	PH-SIM PIN required (SIM lock)	All GSM 07.07 commands (+CME ERROR: 5)
10	SIM not inserted	All GSM 07.07 commands (+CME ERROR: 10)
11	SIM PIN required	All GSM 07.07 commands (+CME ERROR: 11)
12	SIM PUK required	All GSM 07.07 commands (+CME ERROR: 12)
13	SIM failure	All GSM 07.07 commands (+CME ERROR: 13)
16	Incorrect password	+CACM, +CAMM, +CPUC, +CLCK, +CPWD, +CPIN, +CPIN2 (+CME ERROR: 16)
17	SIM PIN2 required	+CPBW (FDN), +CLCK (FDN),
18	SIM PUK2 required	+CACM, +CAMM, +CPUC, +CPBW (FDN), +CPIN, +CPIN2, +CLCK (FDN), +CPWD
20	Memory full	+CPBW
21	Invalid index	+CPBR, +CPBW, ATD>index, +WMGO
22	Not found	+CPBF, +CPBP, +CPBN, +CGSN, +WOPN
24	Text string too long	+CPBW, +CPIN, +CPIN2, +CLCK, +CPWD, +
26	Dial string too long	+CPBW, ATD, +CCFC
30	No network service	+VTS, +COPS=?, +CLCK, +CCFC, +CCWA
32	Network not allowed – emergency calls only	+COPS
40	Network personalisation PIN required (Network lock)	All GSM 07.07 commands (+CME ERROR: 40)

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16.2. Message service failure result code: +CMS ERROR : <er>

<er> is defined as below :

<er>	Meaning	Resulting from the following commands
1 to 127	Error cause values from the GSM recommendation 04.11 Annex E-2	+CMGS, +CMSS
301	SMS service of ME reserved	+CSMS (with +CMS: ERROR 301)
302	Operation not allowed	All SMS commands (+CMSS, +CMGL, +CPMS, +CSMP…
303	Operation not supported	All SMS commands
304	Invalid PDU mode parameter	+CMGS, +CMGW
305	Invalid text mode parameter	+CMGS, +CMGW, +CMSS
310	SIM not inserted	All SMS commands
311	SIM PIN required	All SMS commands
312	PH-SIM PIN required	All SMS commands
313	SIM failure	All SMS commands
316	SIM PUK required	All SMS commands
317	SIM PIN2 required	All SMS commands
318	SIM PUK2 required	All SMS commands
321	Invalid memory index	+CMGR, +CMSS, +CMGD
322	SIM memory full	+CMGW
330	SC address unknown	+CSCA?, +CMSS, +CMGS

16.3. Specific error result codes

<error>	Meaning	Resulting from the following commands
512	MM establishment failure (for SMS)	+CMGS, +CMSS (+CMS ERROR: 512)
513	Lower layer failure (for SMS)	+CMGS, +CMSS
514	CP error (for SMS)	+CMGS, +CMSS
515	Please wait, init or command processing in progress	All commands ("+CME ERROR: 515" or "+CMS ERROR: 515")

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16.4. Failure Cause from GSM 04.08 recommandation (+CEER)

Cause value	Diagnostic
1	Unassigned (unallocated) number
3	No route to destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than ACMmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information

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97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with protocol state
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Interworking, unspecified

All other values in the range 0 to 31 shall be treated as cause 31.
All other values in the range 32 to 47 shall be treated as cause 47.
All other values in the range 48 to 63 shall be treated as cause 63.
All other values in the range 64 to 79 shall be treated as cause 79.
All other values in the range 80 to 95 shall be treated as cause 95.
All other values in the range 96 to 111 shall be treated as cause 111.
All other values in the range 112 to 127 shall be treated as cause 127.

16.5. Specific Failure Cause for +CEER

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

16.6. GSM 04.11 Annex E-2: Mobile originating SM-transfer

These error causes could appear for **SMS commands** (+CMGS, +CMSS, +CMGD…)

Cause no 1: "Unassigned (unallocated) number"

This cause indicates that the destination requested by the Mobile Station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

Cause no 8: "Operator determined barring"

This cause indicates that the MS has tried to send a mobile originating short message when the MS's network operator or service provider has forbidden such transactions.

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Cause no 10: "Call barred"

This cause indicates that the outgoing call barred service applies to the short message service for the called destination.

Cause no 21: "Short message transfer rejected"

This cause indicates that the equipment sending this cause does not wish to accept this short message, although it could have accepted the short message since the equipment sending this cause is neither busy nor incompatible.

Cause no 27: "Destination out of service"

This cause indicates that the destination indicated by the Mobile Station cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signalling message was unable to be delivered to the remote user; e.g., a physical layer or data link layer failure at the remote user, user equipment off-line, etc.

Cause no 28: "Unidentified subscriber"

This cause indicates that the subscriber is not registered in the PLMN (i.e. IMSI not known)

Cause no 29: "Facility rejected"

This cause indicates that the facility requested by the Mobile Station is not supported by the PLMN.

Cause no 30: "Unknown subscriber"

This cause indicates that the subscriber is not registered in the HLR (i.e. IMSI or directory number is not allocated to a subscriber).

Cause no 38: "Network out of order"

This cause indicates that the network is not functioning correctly and that the condition is likely to last a relatively long period of time; e.g., immediately reattempting the short message transfer is not likely to be successful.

Cause no 41: "Temporary failure"

This cause indicates that the network is not functioning correctly and that the condition is not likely to last a long period of time; e.g., the Mobile Station may wish to try another short message transfer attempt almost immediately.

Cause no 42: "Congestion"

This cause indicates that the short message service cannot be serviced because of high traffic.

Cause no 47: "Resources unavailable, unspecified"

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This cause is used to report a resource unavailable event only when no other cause applies.

Cause no 69: "Requested facility not implemented"

This cause indicates that the network is unable to provide the requested short message service.

Cause no 81: "Invalid short message transfer reference value"

This cause indicates that the equipment sending this cause has received a message with a short message reference which is not currently in use on the MS-network interface.

Cause no 95: "Invalid message, unspecified"

This cause is used to report an invalid message event only when no other cause in the invalid message class applies.

Cause no 96: "Invalid mandatory information"

This cause indicates that the equipment sending this cause has received a message where a mandatory information element is missing and/or has a content error (the two cases are undistinguishable).

Cause no 97: "Message type non-existent or not implemented"

This cause indicates that the equipment sending this cause has received a message with a message type it does not recognize either because this is a message not defined or defined but not implemented by the equipment sending this cause.

Cause no 98: "Message not compatible with short message protocol state"

This cause indicates that the equipment sending this cause has received a message such that the procedures do not indicate that this is a permissible message to receive while in the short message transfer state.

Cause no 99: "Information element non-existent or not implemented"

This cause indicates that the equipment sending this cause has received a message which includes information elements not recognized 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 in order for the equipment sending the cause to process the message.

Cause no 111: "Protocol error, unspecified"

This cause is used to report a protocol error event only when no other cause applies.

Cause no 127: "Interworking, unspecified"

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This cause indicates that there has been interworking with a network which does not provide causes for actions it takes; thus, the precise cause for a message which is being send cannot be ascertained.

All values other than specified should be treated as error Cause No 41

16.7. Unsolicited result codes

Verbose result code	Numeric (V0 set)	Description
RING	2	Incoming call signal from network
+CMTI: <mem>,<index>	as verbose	Incoming message stored in <mem> ("SM") at location <index>
+CMT: <oa>… (text mode) or +CMT: [<alpha>,]… (PDU)	as verbose	Incoming message directly displayed
+CDS: <fo>, <mr>… (text mode) or +CDS: <length>,… (PDU)	As verbose	SMS status report after sending a SMS
+CCCM : <ccm>	As verbose	Current Call Meter value
+CKEV: <keynb>	As verbose	Key press or release
+CCWA :<number>,<type>, <class> [,<alpha>]	As verbose	Call Waiting number
+CLIP : <number>, <type> [,,,<alpha>]	As verbose	Incoming Call Presentation
+CREG : <stat> [,<lac>,<ci>]	As verbose	Network registration indication
+CRING : <type>	As verbose	Incoming call type (VOICE, FAX ...)
+WIND: <IndicationNb> [,<CallId>]	As verbose (specific)	Specific unsolicited indication (SIM Insert/Remove, End of init, Reset, Alerting, Call creation/release)
+CSQ: <RxLev>,99	As verbose (specific)	Automatic RxLev indication with AT+CCED=1,8 command
+CSSI: <code1>	As verbose (specific)	Supplementary service notification during a call setup

16.8. 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

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NO CARRIER	3	Connection terminated
OK	0	Acknowledges correct execution of a command line
RING	2	Incoming call signal from network

16.9. 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
+CSSU: <code2>	as verbose (specific)	Supplementary service notification during a call

16.10. Parameters storage

Command	AT&W	AT+CSAS	AT&F	Initial values
+CMEE	X		X	0
+CSCS	X		X	"PCCP437"
ATS0	X		X	0 (no auto-answer)
+CICB	X		X	2 (speech)
+VGR	X		X	64 (all speakers)
+VGT	X		X	64 (all microphones)
+SPEAKER	X		X	0 (Spk 0 & Mic 0)
+SIDET	X		X	1,1
+CREG	X		X	0
+WAIP	X		X	0
+CMGF	X		X	1 (text)
+CSDH	X		X	0
+CNMI		X	X	0,1,0, 0, 0
+CSMP		X	X	1, 167, 0, 0

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+CSCA		X		SIM dependant (phase 2)
+CCWA	X		X	0
+CLIP	X		X	0
+COLP	X		X	0
+CBST	X		X	0, 0, 1
+CRLP	X		X	61, 61, 48, 6, 0
+CR	X		X	0
+CRC	X		X	0
+IPR	X			0 (autobaud)
+IFC	X			2,2
+ICF	X			3,4
E	X			1
&C	X			1
&D	X			1
&S	X			1
Q	X		X	0
V	X		X	1
+DOPT	X		X	1,1
+ECHO	Command		X	0,160,12,5,512,10
+WIND	Command		X	0

16.11.GSM sequences list

In accordance with **GSM 02.30**, the module implements the following GSM sequences, which can be acceded by the ATD and the +CKPD commands.

16.11.1.Security

**04*OLDPIN*NEWPIN*NEWPIN#	Change PIN code
**042*OLDPIN2*NEWPIN2*NEWPIN2#	Change PIN2 code
**05*PUK*NEWPIN*NEWPIN#	Unlock PIN code
**052*PUK2*NEWPIN2*NEWPIN2#	Unlock PIN2 code
*#06#	Show the IMEI number

16.11.2.Call forwarding

*SC#	Activate
SC*PhoneNumber# or ****SC*PhoneNumber*BS# or ****SC*PhoneNumber*[BS]*T#**	Register and activate
*#SC# or *#SC**BS#	Check status
#SC#	Deactivate
##SC# or ##SC**BS#	Unregister and deactivate

The Service codes (SC) are the followings:

002	all call forwarding
004	all conditional call forwarding
21	call forwarding unconditional
61	call forwarding on no answer

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62	call forwarding on not reachable
67	call busy

The Network service codes (BS) are the followings:

No code	All tele and bearer services
10	All teleservices
11	Telephony
12	All data teleservices
13	Fax services
16	Short Message Services
19	All teleservices except SMS
20	All bearer services
21	All asynchronous services
22	All synchronous services
24	All data circuit synchronous
25	All data circuit asynchronous
26	All dedicated packet access
27	All dedicated PAD access

The no reply condition timer (T), is only used for SC=61.

16.11.3.Call barring

*SC*Password# or *SC*Password*BS#	Activate
*#SC# or *#SC**BS#	Check status
#SC*Password# or #SC*Password*BS#	Deactivate
**03*330*OLDPWD*NEWPWD*NEWPWD#	Change password for call barring
03OLDPWD*NEWPWD*NEWPWD#	
*03*330*OLDPWD*NEWPWD*NEWPWD#	
*03**OLDPWD*NEWPWD*NEWPWD#	

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The Service codes (SC) are the followings:

33	call barring of outgoing call
330	all barring service
331	call barring of outgoing international call
332	call barring of outgoing international calls except to HPLMN
333	all outgoing barring service
35	call barring of incoming calls
351	call barring of incoming calls if roaming
353	all incoming barring service

The Network service codes (BS) are the same as these of the call forwarding sequences.

16.11.4.Call waiting

*43#	Activate
*#43#	Check status
#43#	Deactivate

16.11.5.Number presentation

*#30#	CLIP check status
*#31#	CLIR check status
*31#PhoneNumber	Invoke CLIR for a voice call
#31#PhoneNumber	Suppress CLIR for a voice call
*#76#	COLP check status

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16.12.Operator names

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name	Type of network
A	232	01	AUSTRALIA A1.	A1	GSM900
A	232	03	A max.	max.	GSM900
AL	276	01	AMC - AL	A M C	GSM900
ALG	603	01	ALGERIAN MOBILE NETWORK	AMN	GSM900
AND	213	03	STA-MOBILAND	M-AND	GSM900
AUS	505	01	Telstra MobileNet	Telstra	GSM900
AUS	505	02	YES OPTUS AUS	Optus	GSM900
AUS	505	03	VODAFONE AUS	VFONE	GSM900
AZE	400	01	AZE - AZERCELL GSM	ACELL	GSM900
AZE	400	02	BAKCELL GSM 2000	BKCELL	GSM900
B	206	10	B mobistar	mobi*	GSM900
BD	470	03	BD ShebaWorld	SHEBA	GSM900
BEL	206	01	BEL PROXIMUS	PROXI	GSM900
BG	284	01	M-TEL GSM BG	M-TEL	GSM900
BGD	470	01	BGD-GP	GP	GSM900
BHR	426	01	BHR MOBILE PLUS	M.PLUS	GSM900
BIH	218	90	PTT-GSMBIH	BHGSM	GSM900
BRU	528	11	BRU-DSTCom	DSTCom	GSM900
CAN	302	037	CAN-MCELL	MCELL	PCS1900
CH	228	01	SWISS GSM	SWISS	GSM900
CH	228	01	SWISS GSM	SWISS	GSM1800
CH	228	02	diAx Swiss	diAx	GSM900
CH	228	03	orange CH	orange	GSM1800
CHN	460	00	CHINA TELECOM	CT-GSM	GSM900
CHN	460	01	CHN-CUGSM	CU-GSM	GSM900
CI	612	03	CI Ivoiris	Ivoir	GSM900
CI	612	05	TELECEL-CI	TELCEL	GSM900
CL	730	001	CL ENTEL PCS	ENTEL	GSM900
CL	730	010	CL ENTEL PCS	ENTEL	PCS1900
CPV	625	01	CPV MOVEL	CMOVEL	GSM900
CY	280	01	CY CYTAGSM	CY-GSM	GSM900
CZ	230	01	PAEGAS- CZ	PAEGAS	GSM900

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CZ	230	02	EUROTEL - CZ	ET - CZ	GSM900
D	262	01	D1-TELEKOM	D1	GSM900
D	262	02	D2 PRIVAT	D2	GSM900
D	262	03	E-Plus	E-Plus	GSM1800
D	262	07	D Interkom	Ik	GSM1800
DK	238	01	DK TDK-MOBIL	TD MOB	GSM900
DK	238	02	DK SONOFON	SONO	GSM900
DK	238	20	TELIA DK	TELIA	GSM1800
DK	238	30	DK mobilix	#mbix	GSM1800
E	214	01	E AIRTEL	AIRTL	GSM900
E	214	03	E AMENA	AMENA	GSM1800
E	214	07	MOVISTAR	MSTAR	GSM900
EE	248	01	EE EMT GSM	EMT	GSM900
EE	248	02	EE RLE	RLE	GSM900
EE	248	03	EE Q GSM	Q GSM	GSM900
EGY	602	01	EGY MobiNiL	MobiNiL	GSM900
EGY	602	02	EGY CLICK GSM	CLICK	GSM900
ETH	636	01	ETH-MTN	ET-MTN	GSM900
F	208	01	F Itineris	Itine	GSM900
F	208	10	F SFR	SFR	GSM900
F	208	20	F - BOUYGUES TELECOM	BYTEL	GSM1800
F	340	01	F AMERIS	AMERIS	GSM900
F	547	20	F-VINI	VINI	GSM900
F	647	10	SFR REUNION	SFR RU	GSM900
FI	244	03	FI TELIA	TELIA	GSM1800
FI	244	05	FI RADIOLINJA	RL	GSM900
FI	244	09	FI FINNET	FINNET	GSM1800
FI	244	91	FI SONERA	SONERA	GSM900
FIJ	542	01	VODAFONE FIJ	VODAFJ	GSM900
GEO	282	01	GEO-GEOCELL	GCELL	GSM900
GEO	282	02	MAGTI-GSM-GEO	MAGTI	GSM900
GH	620	01	GH SPACEFON	SPACE	GSM900
GIB	266	01	GIBTEL GSM	GIBTEL	GSM900
GN	611	02	GN LAGUI	LAGUI	GSM900
GR	202	01	GR COSMOTE	C-OTE	GSM1800
GR	202	05	GR PANAFON	PAN	GSM900
GR	202	10	GR TELESTET	TLSTET	GSM900
H	216	01	H PANNON GSM	PANNON	GSM900
H	216	30	H-WESTEL 900	W-900	GSM900
HK	454	00	HK TELECOM	TELCO	GSM900

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HK	454	04	HK HTCLGSM	HTCL	GSM900
HK	454	06	HK SMARTONE	HKSMC	GSM900
HK	454	10	HK NEW WORLD	NWPCS	GSM1800
HK	454	12	HK PEOPLES	PTC	GSM1800
HK	454	16	HK SUNDAY	SUNDAY	GSM1800
HR	219	01	HR - CRONET	CRON	GSM900
HR	219	10	HR-VIPNET	VIP	GSM900
I	222	01	I TELECOM	TIM	GSM900
I	222	10	I -OMNITEL	OMNI	GSM900
I	222	88	I WIND	I WIND	GSM900
I	222	88	I WIND	I WIND	GSM1800
IL	425	01	IL ORANGE	ORANGE	GSM900
INA	404	01	INA ESSAR CELLPHONE	ESSARH	GSM900
INA	404	07	INA - TATA CELLULAR	TATA	GSM900
INA	404	10	INA-AIRTL	AIRTL	GSM900
INA	404	11	INA ESSAR CELLPHONE	ESSAR	GSM900
INA	404	12	INA - ESCOTEL	ESCOTL	GSM900
INA	404	14	MODICOM INA	MODICO	GSM900
INA	404	15	INA ESSAR CELLPHONE	ESSARU	GSM900
INA	404	20	INA MaxTouch	MAXTCH	GSM900
INA	404	21	BPL MOBILE	BPL MOBILE	GSM900
INA	404	27	BPL MOBILE	BPL MOBILE	GSM900
INA	404	30	INA COMMAND	COMMND	GSM900
INA	404	41	INA RPG	RPG	GSM900
INA	404	42	INA AIRCEL	AIRCEL	GSM900
INA	404	43	BPL MOBILE	BPL MOB	GSM900
INA	404	46	BPL MOBILE	BPL MOB	GSM900
INA	404	60	INA ESSAR CELLPHONE	ESSARR	GSM900
IND	510	01	IND SATELINDOCEL	SAT-C	GSM900
IND	510	10	IND TELKOMSEL	T-SEL	GSM900
IND	510	11	IND GSM-XL	EXCEL	GSM900
IRL	272	01	IRL Eircell	Eircell	GSM900
IRL	272	02	IRL DIGIFONE	DIGI	GSM900
IS	274	01	IS SIMINN	SIMINN	GSM900
IS	274	02	IS TAL	TAL	GSM900
JOR	416	01	Fastlink	FSTLNK	GSM900
KGZ	437	01	BITEL KGZ	BITEL	GSM900
KHM	456	01	MOBITEL - KHM	MT-KHM	GSM900
KHM	456	02	KHM-SAMART-GSM	KHM-SM	GSM900
KSA	420	01	ALJAWWAL	KSA	GSM900

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KSA	420	07	EAE-ALJAWWAL	EAE	GSM900
KT	419	02	KT MTCNet	MTC	GSM900
KZ	401	01	KZ K-MOBILE	K-MOBILE	GSM900
L	270	01	L LUXGSM	LUXGSM	GSM900
L	270	77	L TANGO	TANGO	GSM900
L	270	77	L TANGO	TANGO	GSM1800
LBR	618	01	LBR OMEGA	OMEGA	GSM900
LSO	651	01	VCL COMMS	VCLCOM	GSM900
LT	246	02	LT BITE GSM	BITE	GSM900
LTU	246	01	OMNITEL LT	OMT	GSM900
LV	247	01	LV LMT GSM	LMT	GSM900
LV	247	02	LV BALTCOM	B-COM	GSM900
M	278	01	VODAFONE MLA	VODA M	GSM900
MAC	455	01	MAC-CTMGSM	CTMGSM	GSM900
MD	259	01	MD VOXTEL	VOXTEL	GSM900
MDG	642	02	MDG ANTARIS	ANTARI	GSM900
MKD	294	01	MKD-MOBIMAK	MOBI-M	GSM900
MOR	604	01	MOR IAM	IAM	GSM900
MOZ	643	01	MOZ - mCel	mCel	GSM900
MRU	617	01	CELLPLUS-MRU	CELL +	GSM900
MW	650	01	MW CP 900	CP 900	GSM900
MY	502	12	MY maxis mobile	maxis	GSM900
MY	502	13	MY EMARTEL	MRTEL	GSM1800
MY	502	16	MY DIGI 1800	MT18	GSM1800
MY	502	17	MY - ADAM 017	ADAM	GSM1800
MY	502	19	MY CELCOM GSM	CELCOM	GSM900
N	242	01	N Telenor	TELENOR	GSM900
N	242	02	N NetCom GSM	N COM	GSM900
NCL	546	01	NCL MOBILIS	MOBNCL	GSM900
NL	204	04	NL LIBERTEL	LIBTEL	GSM900
NL	204	08	NL KPN TELECOM	NL KPN	GSM900
NL	204	12	NL TELFORT	TELFORT	GSM1800
NL	204	16	Ben NL	Ben NL	GSM900
NL	204	20	dutchtone	Dtone	GSM900
NZ	530	01	VODAFONE NZ	VODA	GSM900
OMN	422	02	OMAN MOBILE	OMAN	GSM900
P	268	01	P TELECEL	TLCL	GSM900
P	268	03	P OPTIMUS	OPTIM	GSM900
P	268	06	P TMN	TMN	GSM900
PGY	744	01	HOLA PARAGUAY S.A.	HPGYSA	GSM900

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PH	515	01	ISLACOM	ISLA	GSM900
PH	515	02	Globe Telecom-PH	GLOBE	GSM900
PH	515	03	PH SMART	SMART	GSM900
PH	515	03	PH SMART	SMART	GSM1800
PL	260	01	PL-PLUS	PLUS	GSM900
PL	260	02	PL-ERA GSM	ERAGSM	GSM900
PL	260	03	PL IDEA	IDEA	GSM1800
QAT	427	01	QAT-QATARNET	Q-NET	GSM900
R	635	10	R-CELL	RCELL	GSM900
RA	283	01	RA-ARMGSM	ARMMO1	GSM900
RL	415	01	RL Cellis	CLLIS	GSM900
RL	415	03	RL LibanCell	LibCL	GSM900
RO	226	01	RO CONNEX	CONNEX	GSM900
RO	226	10	RO dialog	dialog	GSM900
ROC	466	92	ROC LDTA GSM	LDGSM	GSM900
RUS	250	01	MTS-RUS	MTS	GSM900
RUS	250	02	North-West GSM RUS	NWGSM	GSM900
RUS	250	05	SCS RUS	SCS	GSM900
RUS	250	07	RUS BMT	BMT	GSM900
RUS	250	07	RUS SMARTS	SMARTS	GSM900
RUS	250	12	Far East RUS	FEast	GSM900
RUS	250	13	Kuban-GSM RUS	KUGSM	GSM900
RUS	250	28	EXTEL RUS	EXTEL	GSM900
RUS	250	39	Uraltel	UTL	GSM900
RUS	250	44	RUS North Caucasian GSM	NC-GSM	GSM900
S	240	01	TELIA S	TELIA	GSM900
S	240	07	S COMVIQ	IQ	GSM900
S	240	08	S EUROPOLITAN	EURO	GSM900
SA	655	01	VodaCom-SA	VODA	GSM900
SA	655	10	MTN-SA	MTN	GSM900
SDN	634	01	SDN MobiTel	SD-MOB	GSM900
SEZ	633	01	SEZ CELLULAR SERVICES	SEYCEL	GSM900
SEZ	633	10	SEZ AIRTEL	AIRTEL	GSM900
SGP	525	01	ST-GSM-SGP	STGSM	GSM900
SGP	525	02	ST-GSM1800-SGP	GSM1800	GSM1800
SGP	525	03	M1-GSM-SGP	M1-GSM	GSM900
SGP	525	05	STARHUB-SGP	STARHUB	GSM900
SI	293	40	SI.MOBIL	SI.MOBIL	GSM900
SI	293	41	SI MOBITEL GSM	SI-GSM	GSM900
SK	231	01	SVK GT	SVK GT	GSM900

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SK	231	02	EUROTEL-SK	ET-SK	GSM900
SN	608	01	SN ALIZE	ALIZE	GSM900
SRI	413	02	SRI DIALOG	DALOG	GSM900
SYR	417	09	SYR MOBILE SYR	MOBILE	GSM900
TG	615	01	TG-TOGO CELL	TGCELL	GSM900
TH	520	01	TH AIS GSM	TH AIS	GSM900
TH	520	10	TH WCS	TH WCS	GSM1800
TH	520	23	TH-HELLO	HELLO	GSM1800
TR	286	01	TR PTT/TURKCELL GSM	TCELL	GSM900
TR	286	02	TR TELSIM	TELSIM	GSM900
TWN	466	01	Far EasTone	FET	GSM900
TWN	466	06	TWN Tuntex GSM 1800	TUNTEX	GSM1900
TWN	466	88	KGT-Online	KGT	GSM1900
TWN	466	93	TWN MOBITAI	TW MOB	GSM900
TWN	466	97	TWN GSM 1800	PCC	GSM1900
TZ	640	01	Tritel - TZ	TRITEL	GSM900
UA	255	01	UA UMC	UMC	GSM900
UA	255	03	UA-KYIVSTAR	UA-KS	GSM900
UA	255	05	UA - GOLDEN TELECOM	GT-BCS	GSM1800
UAE	424	02	UAE ETISALAT	ETSLT	GSM900
UG	641	01	UG CelTel	CELTEL	GSM900
UG	641	10	MTN-UGANDA	MTN-UG	GSM900
UK	234	10	UK CELLNET	CLNET	GSM900
UK	234	15	UK VODAFONE	VODA	GSM900
UK	234	30	ONE 2 ONE	ONE2ONE	GSM1800
UK	234	33	ORANGE	ORANGE	GSM1800
UK	234	50	JERSEY TELECOMS GSM UK	JT GSM	GSM900
UK	234	55	GUERNSEY TEL UK	GSY-TEL	GSM900
UK	234	58	MANX TELECOM PRONTO GSM	MANX	GSM900
UKR	255	02	FLASH-UKR	FLASH	GSM900
USA	310	010	USA MCI		PCS1900
USA	310	011	USA WTTCKy		PCS1900
USA	310	012	USA D&E Com		PCS1900
USA	310	013	USA MobileTel		PCS1900
USA	310	020	USA Sprint		PCS1900
USA	310	030	USA PCS PRIME		PCS1900
USA	310	031	USA-AERIAL		PCS1900
USA	310	040	USA PCS PRIME		PCS1900
USA	310	050	USA PCS PRIME		PCS1900
USA	310	060	USA PCS PRIME		PCS1900

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USA	310	070	USA PCS PRIME		PCS1900
USA	310	080	USA PCS PRIME		PCS1900
USA	310	090	USA PCS PRIME		PCS1900
USA	310	100	USA PCS PRIME		PCS1900
USA	310	110	USA PCS PRIME		PCS1900
USA	310	120	USA PCS PRIME		PCS1900
USA	310	130	USA PCS PRIME		PCS1900
USA	310	140	USA PCS PRIME		PCS1900
USA	310	150	USA BellSouth	BSMDCS	PCS1900
USA	310	160	USA OMNIPOINT		PCS1900
USA	310	170	USA PAC BELL		PCS1900
USA	310	180	USA PAC BELL		PCS1900
USA	310	190	USA COX		PCS1900
USA	310	200	Voice STREAM USA	WWC	PCS1900
USA	310	210	Voice STREAM USA	WWC	PCS1900
USA	310	220	Voice STREAM USA	WWC	PCS1900
USA	310	230	Voice STREAM USA	WWC	PCS1900
USA	310	240	Voice STREAM USA	WWC	PCS1900
USA	310	250	Voice STREAM USA	WWC	PCS1900
USA	310	260	Voice STREAM USA	WWC	PCS1900
USA	310	270	USA PowerTel	USA 27	PCS1900
USA	310	280	USA PowerTel		PCS1900
USA	310	290	USA PowerTel		PCS1900
USA	310	300	USA Aerial		PCS1900
USA	310	310	USA-AERIAL	AERIAL	PCS1900
USA	310	320	USA Aerial		PCS1900
USA	310	330	USA Aerial		PCS1900
USA	310	340	USA Aerial		PCS1900
USA	310	350	USA Aerial		PCS1900
USA	310	380	USA Pocket		PCS1900
USA	310	390	USA Pocket		PCS1900
USA	310	400	USA Pocket		PCS1900
USA	310	410	USA Pocket		PCS1900
USA	310	420	USA Pocket		PCS1900
USA	310	430	USA Pocket		PCS1900
USA	310	440	USA Pocket		PCS1900
USA	310	450	USA Pocket		PCS1900
USA	310	460	USA OMNIPOINT		PCS1900
USA	310	470	USA OMNIPOINT		PCS1900
USA	310	480	USA OMNIPOINT		PCS1900

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USA	310	490	USA OMNIPOINT		PCS1900
USA	310	500	USA OMNIPOINT		PCS1900
USA	310	510	USA OMNIPOINT		PCS1900
USA	310	520	USA OMNIPOINT		PCS1900
USA	310	530	USA OMNIPOINT		PCS1900
USA	310	540	USA OMNIPOINT		PCS1900
USA	310	550	USA OMNIPOINT		PCS1900
USA	310	560	USA OMNIPOINT		PCS1900
USA	310	570	USA OMNIPOINT		PCS1900
USA	310	580	USA OMNIPOINT		PCS1900
USA	310	610	USA OMNIPOINT		PCS1900
USA	310	620	USA OMNIPOINT		PCS1900
USA	310	630	USA OMNIPOINT		PCS1900
USA	310	640	USA Einstein		PCS1900
USA	310	660	USA DiGiPH		PCS1900
USA	310	670	USA WTTCKy		PCS1900
USA	310	680	USA NPI		PCS1900
USA	310	690	USA Conestoga		PCS1900
VZ	734	01	VZ INFO		INFONT
YU	220	01	YU MOBTEL		MOBTEL
ZW	648	01	ZW NET*ONE		NET*1
ZW	648	03	TELECEL ZW		TELECEL

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17. Annex A (informative)

This chapter illustrates informative examples about the general AT commands used for a communication.

Informative example about the PIN required

1.1.1. Example 1 : In the start the ME is powered off.

```
AT+CMEE=1                Enable the report mobile equipment errors
OK

AT+CREG=1                Report registration
OK

AT+CPAS                  Query ME Status
+CPAS: 5                 (ME is asleep)
OK

AT+CFUN=1                Set ME to full functionality
OK

AT+COPS=0                Ask for automatic operator selection and registration.
+CME ERROR: 11           SIM PIN required.

AT+CPIN=1234             User entered a wrong PIN
+CME ERROR: 16           Incorrect password.

AT+CPIN=0000
OK                       PIN Ok

AT+COPS=0                Ask for automatic operator selection and registration.
OK

+CREG:1                  Registered in the network

AT+COPS=3,0              Select the long name format alphanumeric.
OK

AT+COPS?                 Get the operator name
+COPS: 0,0,"I OMNITEL"

OK
```

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1.1.2. Example 2: In the start the ME has already been powered on.

```
AT+CMEE=1                 Enable the report mobile equipment errors
OK

AT+CPAS                   Query ME Status
+CPAS: 0                  ME is already to receive commands
OK

AT+CPIN?                  Is ME asking password?
+CPIN: SIM PIN            Yes, SIM PIN required

AT+CPIN=0000
OK                        PIN Ok
```

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Informative example where a voice call is originated.

In the start the ME is powered on and the SIM PIN has been entered.

```
AT+CMEE=1              Enable the report mobile equipment errors
OK

AT+WIND=63             Ask to display the general indications.
OK

AT+CPIN?               Is ME asking password?
+CPIN: READY           GSM module is ready

ATD0607103543;         Originate a voice call
+WIND: 5,1             Indication about a call creation.

+WIND: 2               Remote party is ringing.

OK                     Call setup was successful

Conversation…

ATH                    Release the call
OK
```

When a voice call is attempted from a phonebook :

```
ATD>"John Pamborn";
+CME ERROR: 22         Entry "John Pamborn" is not found.

ATD>"Joel Guerry";
+WIND: 5,1             Indication about a of call creation.

+WIND: 2               Remote party is ringing.

OK                     Call setup was successful

Conversation…

ATH                    Release the call
OK
```

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Informative example about an incoming call.

In the start the ME is powered on and the SIM PIN has been entered.

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.*
Originate the number on another ME.	
+WIND: 5, 1	*Indication about a call creation. (Ring)*
+CRING: VOICE	*Type of call is VOICE.*
+CLIP: "+33607103543",145,,,"John Panborn"	*Identification about the remote user.*
+CRING: VOICE	
ATA OK	*Answer the call.*
…Conversation…	
NO CARRIER	*The call has been released by the remote user.*
+WIND: 6,1	*Indication about call release.*

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Informative example about a call forwarding

In the start the ME is powered on and the SIM PIN has been entered.

```
AT+CMEE=1                           Enable the report mobile equipment errors
OK

AT+CFCC=1,3,"0607492638"            Registered a call forwarding when mobile is busy.
OK

AT+CCFC=2,3,"0149293031",129        Registered a call forwarding when it does answer.
+CME ERROR: 30                      No network service

AT+CCFC=1,2                         Interrogate
+CCFC: 1,1,"+33607492638",145       Call forwarding active for a voice call.

AT+CFCC=1,4                         Delete call forwarding Mobile busy
OK
```

Informative example about a multiparty

In the start the ME is powered on and the SIM PIN has been entered.

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	*Indication about a of call creation.*
+WIND: 2	*Remote ring.*
OK	*Call setup was successful*
…Conversation…	
+WIND: 5,2	*Indication about another call creation.*
+CCWA: "+33595984834",145,"Dolores Claiborne"	*Another call is waiting.*
AT+CHLD=2 OK	*Put first call on hold and answer the second one.*
…Conversation…	
AT+CHLD=3 OK	*Every calls are into a multiparty.*
AT+CHLD=11	*Release the first call (with John Panborn) and recover the second call (with Dolores Claiborne)*
…Conversation …	
ATH	*Release the second call.*

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Informative example about phonebooks

For each example illustrates in this section: in the start the ME is powered on and the SIM PIN has been entered.

1.6.1. Example 1 : The whole phonebook of the ME is read

```
AT+CPBS=?                                    Query supported phonebook memories
+CPBS: ("SM","FD","ON")                      ADN, FDN, and MSISDN phonebooks supported.

AT+CPBS="SM"                                 Select  ADN phonebook..
OK

AT+CPBR=?                                     Read index range and element lengths.
+CPBR: (1-80),20,14                          80 locations (from 1 to 80), max length of 20
                                             for phone 14 characters max for associated text.

AT+CPBR=1,80                                  Read all entries but only the ones set are returned.
+CPBR: 1,"0346572834",129,"Dolores Claiborne"
+CPBR: 2,"1284374523",129,"Thad Beaumont"
+CPBR: 3, "1243657845",129,"John Panborn"
OK
```

1.6.2. Example 2 : Erase or Write a phonebook entry

```
AT+CPBW=?                                   Query version of the write phonebook entry.
+CPBW: (1-80),20,(129,145),14              80 locations, max length of 20 for phone,
                                            TON/NPI of 129 or 145 and 14 characteers max
                                            For length of text.

AT+CPBW=3                                   Erase location 3
OK

AT+CPBW=3,"4356729012",129,"Carry"         Write at location 3.
Ok

AT+CPBR=1,80                                Read all entries but only the ones set are returned.
+CPBR: 1,"0346572834",129,"Dolores Claiborne"
+CPBR: 2,"1284374523",129,"Thad Beaumont"
+CPBR: 3,"4356729012",129,"Carry"
OK
```

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1.6.3. Example 3 : Find phonebook entries

```
AT+CPBF=?                                    Query version of the write phonebook entry.
+CPBF: 20,14                                 Max length of 20 for phone,
                                             10 characters for the text.


AT+CPBF="D"                                  Read entry with "D".
+CPBF: 1,"0346572834",129,"Dolores Claiborne"
OK


AT+CPBF="W"                                  Read entrie with "D".
+CME ERROR: 22                               Entry not found.
```

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Informative example about short messages

1.6.4. Example 4 : Send a short message

```
AT+CNMI=0,1,1,1,0      SMS-DELIVERs are directly stored, SMS-STATUS-REPORTs are displayed
OK

AT+CSMP=17,169,0,0   "      SMS-SUBMIT message with a validity period (one day)
OK

AT+CMGF=1          " "      Text mode to send a Short Message
OK

AT+CSCA="+33608080706"      Set Service Center Address to +33608080706
OK

AT+CMGS=0601290800 Send a SMS-SUBMIT to mobile phone
➢                          Module sends a 4 characters sequence: 0x0D 0x0A 0x3E 0x20

This is the first text line      Edit first line and press carriage return (<CR>, 0x0D)

This is the last text line      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
```

1.6.5. Example 5: Read short messages

```
AT+CMGF=1                          Text mode to read Short Messages

AT+CMGL="ALL"                      List all stored messages
+CMGL: 1,"REC READ","+336290918",,"99/05/01 14:15:10+04"
This is the first message
+CMGL: 2,"REC UNREAD","+336290918",,"99/05/01 14:19:44+04"
This is the second message
OK

AT+CMGR=1              " "         Read the first message
+CMGR: "REC READ","+336290918",,"99/05/01 14:19:44+04"
OK
```

WAVECOM