HE863 family AT commands reference guide

80377ST10083a Rev.6 – 2012-11-12

Making machines talk.

APPLICABILITY TABLE

PRODUCT
HE863-EUD
HE863-EUG
HE863-EUR
HE863-NAD
HE863-NAG
HE863-NAR
HE863-AUD
HE863-AUG
HE863-AUR

SW Version
11.00.XY2

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Contents

1. Introduction

1.1. Scope

This document is aimed in providing an detailed specification and a comprehensive listing as a reference for the whole set of AT command.

1.2. Audience

Readers of this document should be familiar with Telit modules and their ease of controlling by means of AT Commands.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit Technical Support Center (TTSC) at:

TS-EMEA@telit.com
TS-NORTHAMERICA@telit.com
TS-LATINAMERICA@telit.com
TS-APAC@telit.com

Alternatively, use:

http://www.telit.com/en/products/technical-support-center/contact.php

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

To register for product news and announcements or for product questions contact Telit Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4. Document Organization

This document contains the following chapters:

Chapter 1: "Introduction" provides a scope for this document, target audience, contact and support information, and text conventions.

Chapter 2: "Overview" about the aim of this document and implementation suggestions.

Chapter 3: "AT Commands" The core of this reference guide.

Chapter 4: "ACRONYMS AND ABBREVIATIONS"

Chapter 5: "Document History"

1.5. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.6. Related Documents

- 3gpp TS 27.005 specification and rules
- 3gpp TS 27.007 specification and rules
- Hayes standard AT command set
- Rockwell RC56D & RC336D
- 1vv0300893 HE863 family software user guide

2. HE863 family Product Specification

ITEM	FEATURE					
	HE863-EUD	**HE863-EUR**	**HE863-EUG**	**HE863-NAD**	**HE863-NAR**	**HE863-NAG**
Air interface	▪ Dual-band UMTS/HSPA 2100/900 ▪ Quad-Band GSM 850/900 /1800/1900 ▪ Data only	▪ Dual-band UMTS/HSPA 2100/900 ▪ Quad-Band GSM 850/900 /1800/1900	▪ Dual-band UMTS/HSPA 2100/900 ▪ Quad-Band GSM 850/900 /1800/1900 ▪ Standalone GPS	▪ Dual-band UMTS/HSPA 1900/850 ▪ Quad-Band GSM 850/900 /1800/1900 ▪ Data only	▪ Dual-band UMTS/HSPA 1900/850 ▪ Quad-Band GSM 850/900 /1800/1900	▪ Dual-band UMTS/HSPA 1900/850 ▪ Quad-Band GSM 850/900 /1800/1900 ▪ Standalone GPS
Size	41.4(L)X31.4(W)X2.9(T)					
Data Service	▪ HSPA UL 5.8Mbps, DL 7.2Mbps ▪ EDGE UL 118kbps, DL 236.8Kbps, ▪ GPRS UL 42.8kbps, DL 85.6 Kbps					
Interface	▪ 189 Balls Grid Array interface ▪ 22 general I/O ports maximum including multi-functional I/Os ▪ Status LED output ▪ 3 A/D converters ▪ 1 D/A converter (PWM output) ▪ Full RS232 CMOS UART: baud rate up to 6Mbps ▪ Reserved two wires CMOS UART for debugging ▪ USB 2.0, baud rate up to 480Mbps ▪ 1.8V/3V SIM interface					
Antenna	External Antenna					
Audio	▪ 2 pairs of analog audio interface (Balanced type) ▪ PCM interface for Digital audio (Audio only for HE863-EUG/EUR/NAG/NAR/AUG)					
Message	SMS (MO/MT)					
SIM Card	Support 1.8 and 3V UICC					
ITEM	**FEATURE**					
	HE863-AUD	**HE863-AUR**	**HE863-AUG**			

Air interface	▪ Dual-band UMTS/HSPA 2100/850 ▪ Quad-Band GSM 850/900 /1800/1900 ▪ Data only	▪ Dual-band UMTS/HSPA 2100/850 ▪ Quad-Band GSM 850/900 /1800/1900	Dual-band UMTS/HSPA 2100/850 ▪ Quad-Band GSM 850/900 /1800/1900 ▪ Standalone GPS			
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Message	SMS (MO/MT)					
SIM Card	Support 1.8 and 3V UICC					

NOTE: In the following sections, HE863 family refers to all HE863 products mentioned in the table above. Whenever a command and/or feature is referred to a specific model, it is clearly highlighted

3. AT COMMANDS

The Telit wireless module family can be driven via the serial interface using the standard AT commands[1]. The Telit wireless module family is compliant with:

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. 3gpp TS 27.005 specific AT command (Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS))
3. 3gpp TS 27.007 specific AT command (AT command set for User Equipment (UE))

Moreover Telit wireless module family supports also Telit proprietary AT commands for special purposes.
In the following is described how to use the AT commands with the Telit wireless module family.

NOTE: AT commands described in this document are compatible with Telit's unified AT command interface (SELINT=2).

[1] The **AT** is an **ATTENTION** command and is used as a prefix to other parameters in a string. The AT command combined with other parameters can be set up in the communications package or typed in manually as a command line instruction.command combined with other parameters can be set up in the communications package or typed in manually as a command line instruction.

3.1. Definitions

The following syntactical definitions apply:

<CR> Carriage return character, is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255,is specified within parameter **S3**. The default value is 13.

<LF> Linefeed character, is the character recognised as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter **S4**. The default value is 10. The line feed character is output after carriage return character if verbose result codes are used (**V1** option used) otherwise, if numeric format result codes are used (**V0** option used) it will not appear in the result codes.

<...> Name enclosed in angle brackets is a syntactical element. They do not appear in the command line.

[...] Optional subparameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in AT commands which have a Read command, new value equals to its previous value. In AT commands which do not store the values of any of their subparameters, and so have not a Read command, which are called *action type* commands, action should be done on the basis of the recommended default setting of the subparameter.

3.2. AT Command Syntax

The syntax rules followed by Telit implementation of either Hayes AT commands and GSM/WCDMA commands are very similar to those of standard basic and extended AT commands.
There are two types of extended command:

- **Parameter type commands**. This type of commands may be "set" (to store a value or values for later use), "read" (to determine the current value or values stored), or "tested" (to determine ranges of values supported). Each of them has a test command (trailing **=?**) to give information about the type of its subparameters; they also have a Read command (trailing **?**) to check the current values of subparameters.

- **Action type commands**. This type of command may be "executed" or "tested".
  - "executed" to invoke a particular function of the equipment, which generally involves more than the simple storage of a value for later use
  - "tested" to determine:
    whether or not the equipment implements the Action Command (in this case issuing the correspondent Test command - trailing **=?** - returns the **OK** result code), and, if subparameters are associated with the action, the ranges of subparameters values that are supported.

  Action commands don't store the values of any of their possible subparameters.

Moreover:
The response to the Test Command (trailing **=?**) may be changed in the future by Telit to allow the description of new values/functionalities

If all the subparameters of a parameter type command **+CMD** (or **#CMD** or **$CMD**) are optional, issuing **AT+CMD=<CR>** (or **AT#CMD=<CR>** or **AT$CMD=<CR>**) causes the **OK** result code to be returned and the previous values of the omitted subparameters to be retained.

3.2.1. String Type Parameters

A string, either enclosed between quotes or not, is considered to be a valid string type parameter input. According to V25.ter space characters are ignored on the command line and may be used freely for formatting purposes, unless they are embedded in numeric or quoted string constants; therefore a string containing a space character has to be enclosed between quotes to be considered a valid string type parameter (e.g. typing **AT+COPS=1,0,"A1"** is the same as typing **AT+COPS=1,0,A1**; typing **AT+COPS=1,0,"A BB"** is different from typing **AT+COPS=1,0,A BB**).

A small set of commands requires always writing the input string parameters within quotes: this is explicitly reported in the specific descriptions.

3.2.2. Command Lines

A command line is made up of three elements: the **prefix**, the **body** and the **termination character**.

The **command line prefix** consists of the characters "**AT**" or "**at**", or, to repeat the execution of the previous command line, the characters "**A/**" or "**a/**".
The **termination character** may be selected by a user option (parameter S3), the default being **<CR>**.
The basic structures of the command line are:

- **ATCMD1<CR>** where **AT** is the command line prefix, **CMD1** is the body of a **basic command** (nb: the name of the command never begins with the character "**+**") and **<CR>** is the command line terminator character
- **ATCMD2=10<CR>** where 10 is a subparameter
- **AT+CMD1;+CMD2=, ,10<CR>** These are two examples of **extended commands** (nb: the name of the command always begins with the character "**+**"[2]). They are delimited with semicolon. In the second command the subparameter is omitted.
- **+CMD1?<CR>** This is a Read command for checking current subparameter values
- **+CMD1=?<CR>** This is a test command for checking possible subparameter values

These commands might be performed in a single command line as shown below:

ATCMD1 CMD2=10+CMD1;+CMD2=, ,10;+CMD1?;+CMD1=?<CR>

anyway it is always preferable to separate into different command lines the basic commands and the extended commands; furthermore it is suggested to avoid placing several action

[2] The set of **proprietary AT commands** differentiates from the standard one because the name of each of them begins with either "**@**", "**#**", "**$**" or "*". **Proprietary AT commands** follow the same syntax rules as **extended commands**

commands in the same command line, because if one of them fails, then an error message is received but it is not possible to argue which one of them has failed the execution.

If command **V1** is enabled (verbose responses codes) and all commands in a command line has been performed successfully, result code **<CR><LF>OK<CR><LF>** is sent from the TA to the TE, if subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code **<CR><LF>ERROR<CR><LF>** is sent and no subsequent commands in the command line are processed.

If command **V0** is enabled (numeric responses codes), and all commands in a command line has been performed successfully, result code **0<CR>** is sent from the TA to the TE, if sub-parameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code **4<CR>** and no subsequent commands in the command line are processed.

In case of errors depending on ME operation, **ERROR** (or **4**) response may be replaced by **+CME ERROR: <err> or +CMS ERROR: <err>**.

NOTE: The command line buffer accepts a maximum of 80 characters. If this number is exceeded none of the commands will be executed and TA returns ERROR.

3.2.2.1. ME Error Result Code - +CME ERROR: <err>

This is NOT a command, it is the error response to +**Cxxx 3gpp TS** 27.007 commands.
Syntax: **+CME ERROR: <err>**
Parameter: **<err>** - error code can be either numeric or verbose (see **+CMEE**).The possible values of **<err>** are reported in the table:

Numeric Format	Verbose Format
General errors:	
0	phone failure
1	No connection to phone
2	phone-adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network time-out
32	network not allowed - emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
48	hidden key required (NOTE: This key is required when accessing hidden phonebook entries.)
49	EAP method not supported
50	Incorrect parameters
General purpose error:	
100	unknown
GPRS related errors to a failure to perform an Attach:	
103	Illegal MS (#3)*

Numeric Format	Verbose Format
106	Illegal ME (#6)*
107	GPRS service not allowed (#7)*
111	PLMN not allowed (#11)*
112	Location area not allowed (#12)*
113	Roaming not allowed in this location area (#13)*
GPRS related errors to a failure to Activate a Context and others:	
132	service option not supported (#32)*
133	requested service option not subscribed (#33)*
134	service option temporarily out of order (#34)*
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
Easy GPRS® related errors	
550	generic undocumented error
551	wrong state
552	wrong mode
553	context already activated
554	stack already active
555	activation failed
556	context not opened
557	cannot setup socket
558	cannot resolve DN
559	time-out in opening socket
560	cannot open socket
561	remote disconnected or time-out
562	connection failed
563	tx error
564	already listening
Network survey errors:	
657	Network survey error (No Carrier)*
658	Network survey error (Busy)*
659	Network survey error (Wrong request)*
660	Network survey error (Aborted)*

*(Values in parentheses are 3gpp TS 24.008 cause codes)

3.2.2.2. Message Service Failure Result Code - +CMS ERROR: <err>

This is NOT a command; it is the error response to +Cxxx 3gpp TS 27.005 commands
Syntax: **+CMS ERROR: <err>**
Parameter: **<err>** - numeric error code. The **<err>** values are reported in the table:

Numeric Format	Meaning
0...127	3gpp TS 24.011 Annex E-2 values
128...255	3gpp TS 23.040 sub clause 9.2.3.22 values
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network time-out
340	no +CNMA acknowledgement expected
500	unknown error

3.2.3. Information Responses And Result Codes

The TA response, in case of verbose response format enabled, for the previous examples command line could be as shown below:

Information response to **+CMD1?** **<CR><LF>+CMD1:2,1,10<CR><LF>**

Information response to **+CMD1=?** **<CR><LF>+CMD1(0-2),(0,1),(0-15)<CR><LF>**

Final result code **<CR><LF>OK<CR><LF>**

Moreover there are other two types of result codes:

- *result code*s that inform about progress of TA operation (e.g. connection establishment **CONNECT**)
- *result code*s that indicate occurrence of an event not directly associated with issuance of a command from TE (e.g. ring indication **RING**).

Here the basic result codes according to ITU-T V25Ter recommendation

Result Codes	
Numeric form	Verbose form
0	OK
1	CONNECT
2	RING
3	NO CARRIER
4	ERROR
6	NO DIALTONE
7	BUSY
8	NO ANSWER

3.2.4. Command Response Time-Out

Every command issued to the Telit modules returns a result response if response codes are enabled (default). The time needed to process the given command and return the response varies, depending on the command type. Commands that do not interact with the SIM or the network, and involve only internal set up settings or readings, have an immediate response, depending on SIM configuration(e.g., number of contacts stored in the phonebook, number of stored SMS), or on the network the command may interact with.

In the table below are listed only the commands whose interaction with the SIM or the network could lead to long response timings. When not otherwise specified, timing is referred to set command.
For phonebook and SMS writing and reading related commands, timing is referred to commands issued after phonebook sorting is completed.
For DTMF sending and dialing commands timing is referred to module registered on network("AT+CREG?" answer is "+CREG: 0,1" or "+CREG: 0,5").

Command	Estimated maximum time to get response(Seconds)
+COPS	180 (test command)
+CLCK	180 (SS operation)
	180 (FDN enabling/disabling)
+CPWD	180 (SS operation)
	5 (PIN modification)
+CLIP	180 (read command)
+CLIR	180 (read command)
+CCFC	180
+CCWA	180
+CHLD	180
+CPIN	5
+CPBS	5 (FDN enabling/disabling)
+CPBR	5 (single reading)
	30 (complete reading of a 500 records full phonebook with the baudrate of serial line more than 115200 bps)
+CPBF	30 (string present in a 500 records full phonebook with the baudrate of serial line more than 115200 bps)
	5 (string not present)
+CPBW	5
+CACM	5

+CAMM	5
+CPUC	5
+VTS	180 (transmission of full "1234567890*#ABCD" string with no delay between tones, default duration)
+CSCA	5 (read and set commands)
+CSAS	5
+CRES	5
+CMGS	180 after CTRL-Z; 1 to get '>' prompt
+CMSS	180 after CTRL-Z; 1 to get '>' prompt
+CMGW	5 after CTRL-Z; 1 to get '>' prompt
+CMGD	5 (single SMS cancellation)
	25 (cancellation of 50 SMS)
+CNMA	180 after CTRL-Z; 1 to get '>' prompt
+CMGR	5
+CMGL	7
+CGACT	180
+CGATT	180
D	65 (voice call)
	Timeout set with ATS7 (data call)
A	65 (voice call)
	Timeout set with ATS7 (data call)
H	35
+CHUP	35
+COPN	45
+CRSM	5
#TONE	5 (if no duration specified)
#GPRS	180
#SKTD	140 (DNS resolution + timeout set with AT#SKTCT)
#SKTOP	290 (context activation + DNS resolution + timeout set with AT#SKTCT)
#QDNS	180
#FTPOPEN	500 (timeout set with AT#FTPTO, in case no response is received from server)

#FTPCLOSE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPTYPE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPDELE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPPWD	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPCWD	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPLIST	500 (timeout set with AT#FTPTO, in case no response is received from server) + time to get listing
#FTPPUT	500 (timeout set with AT#FTPTO, in case no response is received from server)
#SGACT	180
#SH	10
#SD	140 (DNS resolution + connection timeout set with AT#SCFG)

3.2.5. Command Issuing Timing

The chain Command -> Response shall always be respected and a new command must not be issued before the module has terminated all the sending of its response result code (whatever it may be).
This applies especially to applications that "sense" the **OK** text and therefore may send the next command before the complete code **<CR><LF>OK<CR><LF>** is sent by the module.
It is advisable anyway to wait for at least 20ms between the end of the reception of the response and the issue of the next AT command.
If the response codes are disabled and therefore the module does not report any response to the command, then at least the 20ms pause time shall be respected.
During command mode, due to hardware limitations, under severe CPU load the serial port can loose some characters if placed in autobauding at high speeds. Therefore if you encounter this problem fix the baud rate with **+IPR** command.

3.3. Storage

3.3.1. Factory Profile And User Profiles

The Telit wireless modules stores the values set by several commands in the internal non volatile memory (NVM), allowing to remember this setting even after power off. In the NVM these values are set either as **factory profile** or as **user profiles**: there are **two customizable user profiles** and **one factory profile** in the NVM of the device: by default the device will start with user profile 0 equal to factory profile.
For backward compatibility each profile is divided into two sections, one **base section** which was historically the one that was saved and restored in early releases of code, and the **extended section** which includes all the remaining values.

The **&W** command is used to save the actual values of **both sections** of profiles into the NVM user profile.
Commands **&Y** and **&P** are both used to set the profile to be loaded at startup. **&Y** instructs the device to load at startup only the **base section**. **&P** instructs the device to load at startup the full profile: **base + extended sections**.
The **&F** command resets to factory profile values only the command of the base section of profile, while the **&F1** resets to factory profile values the full set of base + extended section commands.

The values set by other commands are stored in NVM outside the profile: some of them are stored always, without issuing any **&W**, some other are stored issuing specific commands(**#VAUXSAV**, **#SKTSAV**); all of these values are read at power-up.

The values set by following commands are stored in the profile base section:

DSR (C107) OPTIONS:	&S
DTR (C108) OPTIONS:	&D
DCD (C109) OPTIONS:	&C
RI (C125) OPTIONS:	\R
DEFAULT PROFILE:	&Y,&P
S REGISTERS:	S1

The values set by following commands are stored in the profile extended section and they depend on the specific AT channel instance:

+CREG,	+CLIP,	+CLIR,
+CCWA,	+CUSD,	+CAOC,
+CSSN,	+CMEE,	+CGREG,
+CMGF,	+CSDH,	#QSS,
#MWI,	#SKIPESC,	#STIA
#CODEC,	+XTESM	

The values set by following commands are stored in the profile extended section and they don't depend on the specific AT channel instance:

+CALM,	+CRSL,	+CMUT,
+CLVL,	#CAP,	#SRS,
#SRP,	#STM,	#E2SMSRI,
#SHFEC,	#HFMICG,	#HSMICG,
#SHFSD,	#SPKMUT,	#NITZ,
#E2SLRI,	#PSEL,	#HSRECG,
#SHFAGC,	#SHSAGC,	#SHSEC,
#SHSNR,	#SHFNR,	#SHSSD,
#TSVOL,	#PSMRI	#TEMPMON,

The values set by following commands are automatically stored in NVM, without issuing any storing command and independently from the profile (unique values), and are automatically restored at startup:

#SCFG,	#DNS,	#TCPMAXDAT,
#SCFGEXT,	#TEMPCFG	

The values set by following commands are stored in NVM on demand, issuing specific commands and independently from the profile:

#VAUX
stored by #VAUXSAV command.

#UDT
Stored by #UDTSAV command.

#USERID,	#PASSW,	#PKTSZ,
#DSTO,	#SKTTO,	#SKTSET
#SKTCT		

stored by #SKTSAV command and automatically restored at startup; factory default valutes are restored by #SKTRST command.

+CSCA,	+CSMP,	+CSCB

stored by +CSAS[3] command and restored by +CRES[4] command.

[3] Both commands +CSAS and +CRES deal with non-volatile memory, intending for it either the NVM and the SIM storage.

3.4. AT Commands Availability Table

The following table lists the AT commands set and matches the availability of every single command versus the Telit wireless module family.

COMMAND	HE863-EUD HE863-NAD HE863-AUD	HE863-EUR HE863-NAR HE863-AUR	HE863-EUG HE863-NAG HE863-AUG	Function
Command Line General Format – Command Line Prefixes				
AT	•	•	•	Starting A Command Line
A/	•	•	•	Last Command Automatic Repetition Prefix
Hayes AT Commands – Generic Modem Control				
&F	•	•	•	Set To Factory-Defined Configuration
Z	•	•	•	Soft Reset
+FCLASS				Select Active Service Class
&Y	•	•	•	Designate A Default Reset Basic Profile
&P	•	•	•	Designate A Default Reset Full Profile
&W	•	•	•	Store Current Configuration
+GMI	•	•	•	Manufacturer Identification
+GMM	•	•	•	Model Identification
+GMR	•	•	•	Revision Identification
+GCAP	•	•	•	Capabilities List
+GSN	•	•	•	Serial Number
%L	•	•	•	Line Signal Level
%Q	•	•	•	Line Quality
Hayes AT Commands – DTE-Modem Interface Control				
E	•	•	•	Command Echo
Q	•	•	•	Quiet Result Codes
V	•	•	•	Response Format
X	•	•	•	Extended Result Codes
+IPR	•	•	•	Fixed DTE Interface Rate
&C	•	•	•	Data Carrier Detect (DCD) Control
&D	•	•	•	Data Terminal Ready (DTR) Control
&S	•	•	•	Data Set Ready (DSR) Control
\R	•	•	•	Ring (RI) Control
Hayes AT Commands – Call Control				
D		•	•	Dial
A		•	•	Answer
H		•	•	Disconnect
&G	•	•	•	Guard Tone
&Q	•	•	•	Sync/Async Mode
Hayes AT Commands – Modulation Control				
+MS	•	•	•	Modulation Selection
%E	•	•	•	Line Quality Monitor And Auto Retrain Or Fallback/Fallforward
Hayes AT Commands – S Parameters				
S0		•	•	Number Of Rings To Auto Answer
ETSI GSM 07.07.27.007 – General				
+CGMI	•	•	•	Request Manufacturer Identification
+CGMM	•	•	•	Request Model Identification
+CGMR	•	•	•	Request Revision Identification
+CGSN	•	•	•	Request Product Serial Number Identification
+CSCS	•	•	•	Select TE Character Set
+CIMI	•	•	•	Request International Mobile Subscriber Identity (IMSI)
ETSI GSM 07.07/27.007 – Call Control				
+CHUP		•	•	Hang Up Call
+CSTA		•	•	Select type of address
+CBST		•	•	Select Bearer Service Type
+CRLP	•	•	•	Radio Link Protocol

COMMAND	HE863-EUD HE863-NAD HE863-AUD	HE863-EUR HE863-NAR HE863-AUR	HE863-EUG HE863-NAG HE863-AUG	Function
+CR	•	•	•	Service Reporting Control
+CEER	•	•	•	Extended Error Report
+CRC	•	•	•	Cellular Result Codes
+CVHU		•	•	Voice Hang Up Control
ETSI GSM 07.07/27.007 – Network Service Handling				
+CNUM	•	•	•	Subscriber Number
+COPN	•	•	•	Read Operator Names
+CREG	•	•	•	Network Registration Report
+COPS	•	•	•	Operator Selection
+CLCK	•	•	•	Facility Lock/Unlock
+CPWD	•	•	•	Change Facility Password
+CLIP		•	•	Calling Line Identification Presentation
+CLIR		•	•	Calling Line Identification Restriction
+COLP		•	•	Connected line identification presentation
+CCFC		•	•	Call Forwarding Number And Conditions
+CCWA		•	•	Call Waiting
+CHLD		•	•	Call Holding Services
+CUSD		•	•	Unstructured Supplementary Service Data
+CAOC		•	•	Advice Of Charge
+CLCC		•	•	List Current Calls
+CSSN		•	•	SS Notification
+CCUG		•	•	Closed User Group Supplementary Service Control
+CPOL	•	•	•	Preferred Operator List
+CPLS	•	•	•	Selection of preferred PLMN list
ETSI GSM 07.07/27.007 – Mobile Equipment Control				
+CPAS	•	•	•	Phone Activity Status
+CFUN	•	•	•	Set Phone Functionality
+CPIN	•	•	•	Enter PIN
+CSQ	•	•	•	Signal Quality
+CPBS	•	•	•	Select Phonebook Memory Storage
+CPBR	•	•	•	Read Phonebook Entries
+CPBF	•	•	•	Find Phonebook Entries
+CPBW	•	•	•	Write Phonebook Entry
+CCLK	•	•	•	Clock Management
+CSIM	•	•	•	Generic SIM Access
+CRSM	•	•	•	Restricted SIM Access
+CALM	•	•	•	Alert Sound Mode
+CRSL	•	•	•	Ringer Sound Level
+CMUT	•	•	•	Microphone Mute Control
+CACM		•	•	Accumulated Call Meter
+CAMM		•	•	Accumulated Call Meter Maximum
+CPUC		•	•	Price per Unit and Currency Table
+CLAC	•	•	•	Available AT Commands
+CCID	•	•	•	Read ICCID (Integrated Circuit Card Identification)
+CALA	•	•	•	Alarm Management
+CALD	•	•	•	Delete Alarm
ETSI GSM 07.07/27.007 – Mobile Equipment Errors				
+CMEE	•	•	•	Report Mobile Equipment Error
ETSI GSM 07.077/27.007 – Voice Control				
+VTS		•	•	DTMF Tones Transmission
+VTD		•	•	Tone Duration
ETSI GSM 07.077/27.007 – Commands For GPRS				
+CGCLASS	•	•	•	GPRS Mobile Station Class
+CGATT	•	•	•	GPRS Attach Or Detach
+CGEREP	•	•	•	GPRS Event Reporting
+CGREG	•	•	•	GPRS Network Registration Status
+CGDCONT	•	•	•	Define PDP Context
+CGQMIN	•	•	•	Quality Of Service Profile (Minimum Acceptable)

COMMAND	HE863-EUD HE863-NAD HE863-AUD	HE863-EUR HE863-NAR HE863-AUR	HE863-EUG HE863-NAG HE863-AUG	Function
+CGEQMIN	•	•	•	3G Quality Of Service Profile (Minimum Acceptable)
+CGQREQ	•	•	•	Quality Of Service Profile (Requested)
+CGEQREQ	•	•	•	3G Quality Of Service Profile (Requested)
+CGACT	•	•	•	PDP Context Activate Or Deactivate
+CGPADDR	•	•	•	Show PDP Address
+CGEQNEG	•	•	•	3G Quality of Service Profile (Negotiated)
+CGDATA	•	•	•	Enter Data State
ETSI GSM 07.077/27.007 – Commands For Battery Charger				
+CBC	•	•	•	Commands For Battery Charger
ETSI GSM 07.05/27.005 – General Configuration				
+CSMS	•	•	•	Select Message Service
+CPMS	•	•	•	Preferred Message Storage
+CMGF	•	•	•	Message Format
ETSI GSM 07.05/27.005 – Message Configuration				
+CSCA	•	•	•	Service Center Address
+CGSMS	•	•	•	Select service for MO SMS services
+CSMP	•	•	•	Set Text Mode Parameters
+CSDH	•	•	•	Show Text Mode Parameters
+CSCB	•	•	•	Select Cell Broadcast Message Types
+CSAS	•	•	•	Save Settings
+CRES	•	•	•	Restore Settings
ETSI GSM 07.05/27.005 – Message Receiving And Reading				
+CNMI	•	•	•	New Message Indications To Terminal Equipment
+CMGL	•	•	•	List Messages
+CMGR	•	•	•	Read Message
+CNMA	•	•	•	New Message Acknowledgement to ME/TA
ETSI GSM 07.05/27.005 – Message Sending And Writing				
+CMGS	•	•	•	Send Message
+CMSS	•	•	•	Send Message From Storage
+CMGW	•	•	•	Write Message To Memory
+CMGD	•	•	•	Delete Message
+CMMS	•	•	•	More Message to Send
Custom AT Commands – General Configuration				
#CAP		•	•	Change Audio Path
#OAP		•	•	Open Audio Loop
#SRS		•	•	Select Ringer Sound
#SRP		•	•	Select Ringer Path
#STM		•	•	Signaling Tones Mode
#TONE		•	•	Tone Playback
#TSVOL		•	•	Tone Classes Volume
#SHDN	•	•	•	Software Shut Down
#QTEMP	•	•	•	Query Temperature Overflow
#TEMPMON	•	•	•	Temperature Monitor
#GPIO	•	•	•	General Purpose Input/Output Pin Control
#SLED	•	•	•	STAT_LED GPIO Setting
#SLEDSAV	•	•	•	Save STAT_LED GPIO Setting
#MONI	•	•	•	Cell Monitor
#RFSTS	•	•	•	Read Current Network Status
#SERVINFO	•	•	•	Serving Cell Information
#ADC	•	•	•	Read Analog/Digital Converter Input
#DAC	•	•	•	Digital/Analog Converter Control
#VAUX	•	•	•	Auxiliary Voltage Output Control
#VAUXSAV	•	•	•	Auxiliary Voltage Output Save
#AXE	•	•	•	AXE Pin Reading
#CBC	•	•	•	Battery And Charger Status
#CODEC		•	•	Audio Codec
#SHFEC		•	•	Handsfree Echo Canceller
#HFMICG		•	•	Handsfree Microphone Gain
#HSMICG		•	•	Handset Microphone Gain

COMMAND	HE863-EUD HE863-NAD HE863-AUD	HE863-EUR HE863-NAR HE863-AUR	HE863-EUG HE863-NAG HE863-AUG	Function
#SHFSD		•	•	Set Headset Sidetone
#SPKMUT		•	•	Speaker Mute COntrol
#HFRECG		•	•	Handsfree Receiver Gain
#HSRECG		•	•	Handset Receiver Gain
#PRST		•	•	Audio Profile Factory Configuration Reset
#PSAV		•	•	Audio Profile Configuration Save
#PSEL		•	•	Audio Profile Selection
#PSET		•	•	Audio Profile Setting
#SHFAGC		•	•	Handsfree Automatic Gain Control
#SHFNR		•	•	Handsfree Noise Reduction
#SHSAGC		•	•	Handset Automatic Gain Control
#SHSEC		•	•	Handset Echo Canceller
#SHSNR		•	•	Handset Noise Reduction
#SHSSD		•	•	Set Handset Sidetone
#NITZ	•	•	•	Network Timezone
#BND	•	•	•	Select Band
#AUTOBND	•	•	•	Automatic Band Selection
#RTCSTAT	•	•	•	RTC Status
#GSMAD	•	•	•	GSM Antenna Detection
#V24CFG	•	•	•	V24 Output Pins Configuration
#V24	•	•	•	V24 Output Pins Control
#PSMRI	•	•	•	Power Saving Mode Ring Indicator
#SRAT	•	•	•	Selection of Radio Access Technology
#NEER	•	•	•	Extended Error Report for Location Update Reject During CS Registration
#REGSTAT	•	•	•	Current Network Registration Status
#CALLSTAT	•	•	•	Set Reporting Call Status
#CGED	•	•	•	GPRS cell environment description
#CELLINFO	•	•	•	Provide Cell information
#DBGS	•	•	•	Debug screen command
#PCNT	•	•	•	Remained PIN Counter
#QSS	•	•	•	Query SIM Status
#CCID	•	•	•	Read ICCID (Integrated Circuit Card Identification)
+XSIMSTATE	•	•	•	Display SIM and phonelock status
#E2SMSRI	•	•	•	SMS Ring Indicator
#MWI	•	•	•	Message Waiting Indicator
+XSVM	•	•	•	Set Voice Mail Number
+XTESM	•	•	•	Status of External SMS Storage
Custom AT Commands – Enhanced Easy GPRS® Extension				
#USERID	•	•	•	Authentication User ID
#PASSW	•	•	•	Authentication Password
#PKTSZ	•	•	•	Packet Size
#DSTO	•	•	•	Data Sending Time-Out
#SKTTO	•	•	•	Socket Inactivity Time-Out
#SKTSET	•	•	•	Socket Definition
#SKTOP	•	•	•	Socket Open
#QDNS	•	•	•	Query DNS
#DNS	•	•	•	Manual DNS Selection
#SKTCT	•	•	•	Socket TCP Connection Time-Out
#SKTSAV	•	•	•	Socket Parameters Save
#SKTRST	•	•	•	Socket Parameters Reset
#GPRS	•	•	•	GPRS Context Activation
#SKTD	•	•	•	Socket Dial
#SKTL	•	•	•	Socket Listen
#E2SLRI	•	•	•	Socket Listen Ring Indicator
#FRWL	•	•	•	Firewall Setup
#TCPMAXDAT	•	•	•	Maximum TCP Payload Size
Custom AT Commands – Multisocket				
#SS	•	•	•	Socket Status

COMMAND	HE863-EUD HE863-NAD HE863-AUD	HE863-EUR HE863-NAR HE863-AUR	HE863-EUG HE863-NAG HE863-AUG	Function
#SI	•	•	•	Socket Info
#SGACT	•	•	•	Context Activation
#SH	•	•	•	Socket Shutdown
#SCFG	•	•	•	Socket Configuration
#SCFGEXT	•	•	•	Socket Configuration Extended
#SD	•	•	•	Socket Dial
#SA	•	•	•	Socket Accept
#SO	•	•	•	Socket Restore
#SL	•	•	•	Socket Listen
#SRECV	•	•	•	Receive Data In Command Mode
#SSEND	•	•	•	Send Data In Command Mode
#SSENDEXT	•	•	•	Send Data In Command Mode extended
#SLUDP	•	•	•	Socket Listen UDP
Custom AT Commands - FTP				
#FTPTO	•	•	•	FTP Time Out
#FTPOPEN	•	•	•	FTP Open
#FTPCLOSE	•	•	•	FTP Close
#FTPPUT	•	•	•	FTP Put
#FTPGET	•	•	•	FTP Get
#FTPTYPE	•	•	•	FTP Type
#FTPMSG	•	•	•	FTP Read Message
#FTPDELE	•	•	•	FTP Delete
#FTPPWD	•	•	•	FTP Print Working Directory
#FTPCWD	•	•	•	FTP Change Working Directory
#FTPLIST	•	•	•	FTP List
Custom AT Commands GPS Application				
$GPSP			•	GPS Controller Power Management
$GPSR			•	GPS Reset
$GPSAT			•	GPS Antenna Type Definition
$GPSSAV			•	Save GPS Parameters Configuration
$GPSNNUM			•	Unsolicited NMEA Data Configuration - $GPSNMUN

3.5. AT Commands References

3.5.1. Command Line General Format

3.5.1.1. Command Line Prefixes

3.5.1.1.1. Starting A Command Line - AT

AT - Starting A Command Line	
AT	The prefix **AT**, or **at**, is a two-character abbreviation (**ATtention**), always used to start a command line to be sent from TE to TA
Reference	3GPP TS 27.007

3.5.1.1.2. Last Command Automatic Repetition - A/

A/ - Last Command Automatic Repetition	
A/	If the prefix **A/** or **a/** is issued, the MODULE immediately executes once again the body of the preceding command line. No editing is possible and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired. If **A/** is issued before any command line has been executed, the preceding command line is assumed to have been empty (that results in an **OK** result code). Note: this command works only at fixed IPR. Note: the custom command **#/** has been defined: it causes the last command to be executed again too; but it doesn't need a fixed IPR.
Reference	V25ter

3.5.2. Hayes Compliant AT Commands

3.5.2.1. Generic Modem Control

3.5.2.1.1. Set To Factory-Defined Configuration - &F

&F - Set To Factory-Defined Configuration	
AT&F[<value>]	Execution command sets the configuration parameters to default values specified by manufacturer; it takes in consideration hardware configuration switches and other manufacturer-defined criteria. Parameter: **<value>**: 0 - just the factory profile base section parameters are considered. 1 - either the factory profile base section and the extended section are considered (full factory profile). Note: if parameter **<value>** is omitted, the command has the same behaviour as **AT&F0**
Reference	V25ter.

3.5.2.1.2. Soft Reset - Z

Z - Soft Reset	
ATZ[<n>]	Execution command loads the default factory profile. Parameter: **<n>** 0..1 - user profile number (No effect on behaviour) Note: any call in progress will be terminated. Note: if parameter **<n>** is omitted, the command has the same behaviour as **ATZ0**.
Reference	V25ter.

3.5.2.1.3. Select Active Service Class - +FCLASS

+FCLASS - Select Active Service Class	
AT+FCLASS=<n>	Set command sets the wireless module in specified connection mode (data, voice), hence all the calls done afterwards will be data or voice. Parameter: **<n>** 0 - data

+FCLASS - Select Active Service Class	
	8 - voice
AT+FCLASS?	Read command returns the current configuration value of the parameter **<n>**.
AT+FCLASS=?	Test command returns all supported values of the parameters **<n>**.
Note	"ATD<number>;" (end with semicolon) will initiate voice call no matter which connection mode is set by +FCLASS.
Reference	3GPP TS 27.007

3.5.2.1.4. Default Reset Basic Profile Designation - &Y

&Y - Default Reset Basic Profile Designation	
AT&Y[<n>]	Execution command defines the basic profiles which will be loaded on startup. Parameter: **<n>** 0..1 - profile (default is 0): the wireless module is able to store 2 complete configurations (see **&W**). Note: differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&Y** will be loaded on every startup. Note: if parameter is omitted, the command has the same behaviour as **AT&Y0**

3.5.2.1.5. Default Reset Full Profile Designation - &P

&P - Default Reset Full Profile Designation	
AT&P[<n>]	Execution command defines which full profile will be loaded on startup. Parameter: **<n>** 0..1 – profile number: the wireless module is able to store 2 full configurations (see command **&W**). Note: differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&P** will be loaded on every startup. Note: if parameter is omitted, the command has the same behaviour as **AT&P0**
Reference	Telit Specifications

3.5.2.1.6. Store Current Configuration - &W

&W - Store Current Configuration	
AT&W[<n>]	Execution command stores on profile **<n>** the complete configuration of the device. Parameter: **<n>**

&W - Store Current Configuration	
	0..1 - profile Note: if parameter is omitted, the command has the same behaviour of **AT&W0**.

3.5.2.1.7. Manufacturer Identification - +GMI

+GMI - Manufacturer Identification	
AT+GMI	Execution command returns the manufacturer identification.
AT+GMI=?	Test command returns **OK** result code.
Reference	V.25ter

3.5.2.1.8. Model Identification - +GMM

+GMM - Model Identification	
AT+GMM	Execution command returns the model identification.
AT+GMM=?	Test command returns **OK** result code.
Reference	V.25ter

3.5.2.1.9. Revision Identification - +GMR

+GMR - Revision Identification	
AT+GMR	Execution command returns the software revision identification.
AT+GMR=?	Test command returns **OK** result code.
Reference	V.25ter

3.5.2.1.10. Capabilities List - +GCAP

+GCAP - Capabilities List	
AT+GCAP	Execution command returns the equipment supported command set list. Where: **+CGSM**: 3GPP TS command set **+FCLASS**: Fax command set **+DS**: Data Service common modem command set **+ES**: WCDMA data Service common modem command set **+MS**: Mobile Specific command set
AT+GCAP=?	Test command returns **OK** result code.
Reference	V.25ter

3.5.2.1.11. Serial Number - +GSN

+GSN - Serial Number	
AT+GSN	Execution command returns the device IMEI. Note: The number returned from the same command in Telit GC series is board

+GSN - Serial Number	
	serial number. HE863 series returns IMEI assigned to the indivisual product.
AT+GSN=?	Test command returns **OK** result code.
Reference	V.25ter

3.5.2.1.12. Display Current Base Configuration And Profile - &V

&V - Display Current Base Configuration And Profile	
AT&V	Execution command returns some of the base configuration parameters settings.

3.5.2.1.13. Display Current Configuration And Profile - &V0

&V0 - Display Current Configuration And Profile	
AT&V0	Execution command returns all the configuration parameters settings. Note: this command is the same as **&V**, it is included only for backwards compatibility.

3.5.2.1.14. S Registers Display - &V1

&V1 - S Registers Display	
AT&V1	Execution command returns the value of the **S** registers in decimal and hexadecimal value in the format: **REG DEC HEX** **<reg0> <dec> <hex>** **<reg1> <dec> <hex>** ... where **<reg*n*>** - **S** register number 000..005 007 012 025 038 **<dec>** - current value in decimal notation **<hex>** - current value in hexadecimal notation

3.5.2.1.15. Extended S Registers Display - &V3

&V3 - Extended S Registers Display	
AT&V3	Execution command returns the value of the **S** registers in decimal and hexadecimal value in the format:

&V3 - Extended S Registers Display	
	REG **DEC** **HEX** **<reg0>** **<dec>** **<hex>** **<reg1>** **<dec>** **<hex>** ... where **<reg*n*>** - **S** register number 000..005 007 012 025 030 038 **<dec>** - current value in decimal notation **<hex>** - current value in hexadecimal notation

3.5.2.1.16. Display Last Connection Statistics - &V2

&V2 - Display Last Connection Statistics	
AT&V2	Execution command returns the last connection statistics & connection failure reason.

3.5.2.1.17. Line Signal Level - %L

%L - Line Signal Level	
AT%L	It has no effect and is included only for backward compatibility with landline modems

3.5.2.1.18. Line Quality - %Q

%Q - Line Quality	
AT%Q	It has no effect and is included only for backward compatibility with landline modems

3.5.2.2. DTE - Modem Interface Control

3.5.2.2.1. Command Echo - E

E - Command Echo	
ATE[<n>]	Set command enables/disables the command echo. Parameter: **<n>** 0 - disables command echo 1 - enables command echo (factory default) , hence command sent to the device are echoed back to the **DTE** before the response is given.

E - Command Echo	
	Note: if parameter is omitted, the command has the same behaviour of **ATE0**
Reference	V25ter

3.5.2.2.2. Quiet Result Codes - Q

Q - Quiet Result Codes	
ATQ[<n>]	Set command enables or disables the result codes. Parameter: **<n>** 0 - enables result codes (factory default) 1 - disables result codes 2 - disables result codes (only for backward compatibility) Note: After issuing either **ATQ1** or **ATQ2** every information text transmitted in response to commands is not affected Note: if parameter is omitted, the command has the same behaviour of **ATQ0**
Example	*After issuing ATQ1 or ATQ2* AT+CGACT=? **+CGACT: (0-1) nothing is appended to the response**
Reference	V25ter

3.5.2.2.3. Response Format - V

V - Response Format	
ATV[<n>]	Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (see [§3.2.3 Information Responses And Result Codes] for the table of result codes). Parameter: **<n>** 0 - limited headers and trailers and numeric format of result codes information responses: **<text><CR><LF>** result codes: **<numeric code><CR>** 1 - full headers and trailers and verbose format of result codes (factory default)

V - Response Format	
	information responses: **<CR><LF>** **<text><CR><LF>** result codes: **<CR><LF>** **<verbose code><CR><LF>** Note: the **<text>** portion of information responses is not affected by this setting. Note: if parameter is omitted, the command has the same behaviour of ATV0
Reference	V25ter

3.5.2.2.4. Extended Result Codes - X

X - Extended Result Codes	
ATX[<n>]	Set command selects the result code messages subset used by the modem to inform the **DTE** of the result of the commands. Parameter: **<n>** 0 - send only **OK**, **CONNECT**, **RING**, **NO CARRIER**, **ERROR**, **NO ANSWER** results. Busy tones reporting is disabled. 1..4 - reports all messages (factory default is 1). Note: If parameter is omitted, the command has the same behaviour of **ATX0** Note: Current value is returned by AT&V Parameter: <n> 0 - EXTENDED MESSAGES : X0=NO 1..4 - EXTENDED MESSAGES : X1=YES
Note	For complete control on **CONNECT** response message see also **+DR** command.
Reference	V25ter

3.5.2.2.5. Fixed DTE Interface Rate - +IPR

+IPR - Fixed DTE Interface Rate	
AT+IPR=<rate>	Set command specifies the **DTE** speed (UART only) at which the device accepts commands during command mode operations; it may be used to fix the **DTE-DCE** interface speed. Parameter: **<rate>** 19200 38400 57600 115200 (default) 230400 460800 500000 750000 921600 1843200 3000000 3250000 6000000
AT+IPR?	Read command returns the current value of **+IPR** parameter.
AT+IPR=?	Test command returns the list of fixed-only **<rate>** values in the format: **+IPR**: (list of fixed-only **<rate>** values)
Reference	V25ter

3.5.2.2.6. DTE-Modem Local Flow Control - +IFC

+IFC – DTE-Modem Local Flow Control	
AT+IFC=<by_te>, <by_ta>	Set command selects the flow control behaviour of the serial port in both directions: from **DTE** to **modem (<by_ta>** option) and from **modem** to **DTE (<by_te>)** Parameters: **<by_te>** - flow control option for the data received by **DTE** 0 - flow control None 1 - **XON/XOFF** filtered 2 - **C105 (RTS)** (factory default) 3 - **XON/XOFF** not filtered **<by_ta>** - flow control option for the data sent by **modem** 0 - flow control None 1 - **XON/XOFF** 2 - **C106 (CTS)** (factory default) Note: **Set command has no effect is included only for backward compatibility, only store values.**

+IFC – DTE-Modem Local Flow Control	
	Note: Flow control is always **hardware bi-directional flow control (both RTS/CTS** active**)** Note: Hardware flow control **(AT+IFC=2,2)** is not active in command mode.
AT+IFC?	Read command returns active flow control settings. **+IFC: 0,0**
AT+IFC=?	Test command returns all supported values of the parameters **<by_te>** and **<by_ta>.**
Reference	V25ter

3.5.2.2.7. DTE-Modem Character Framing - +ICF

+ICF - DTE-Modem Character Framing	
AT+ICF=<format> [,<parity>]	Set command defines the asynchronous character framing to be used when autobauding is disabled. The HE863 family supoports only the 8 Data, 1 Stop setting. Parameters: **<format>** - determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame. 3 - 8 Data, 1 Stop (default) **<parity>** - determines how the parity bit is generated and checked, if present; setting this subparameter has no meaning. 0 - Odd (not supported) 1 - Even (not supported)
AT+ICF?	Read command returns current settings for subparameters **<format>** and **<parity>**. The current setting of subparameter **<parity>** will always represented as 0.
AT+ICF=?	Test command returns the ranges of values for the parameter **<format>**.
Reference	V25ter
Example	AT+ICF = 3 - 8N1 (default) AT+ICF=? +ICF: (3)

3.5.2.2.8. Data Carrier Detect (DCD) Control - &C

&C - Data Carrier Detect (DCD) Control	
AT&C[<n>]	Set command controls the RS232 **DCD** output behaviour. Parameter: **<n>** 0 - **DCD** remains **high** always.

&C - Data Carrier Detect (DCD) Control	
	1 - **DCD** follows the Carrier detect status: if carrier is detected **DCD** is high, otherwise **DCD** is **low**. (factory default) 2 - **DCD off** while disconnecting Note: if parameter is omitted, the command has the same behaviour of **AT&C0** Note: Current value is returned by AT&V
Reference	V25ter

3.5.2.2.9. Data Terminal Ready (DTR) Control - &D

&D - Data Terminal Ready (DTR) Control	
AT&D[<n>]	Set command controls the Module behaviour to the RS232 **DTR** transitions. Parameter: **<n>** 0 - **DTR** transitions are ignored. (factory default) 1 - when the MODULE is connected, the **High** to **Low** transition of **DTR** pin sets the device in command mode, the current connection is NOT closed. 2 - when the MODULE is connected , the **High** to **Low** transition of **DTR** pin sets the device in command mode and the current connection is closed. Note: if a connection has been set up issuing either **#SKTD** or **#SKTOP**, then **AT&D1** has the same effect as **AT&D2**. Note: if **AT&D2** has been issued and the **DTR** has been tied **Low**, autoanswering is inhibited and it is possible to answer only issuing command **ATA**. Note: if parameter is omitted, the command has the same behaviour of **AT&D0**
Reference	V25ter

3.5.2.2.10. Flow Control - &K

&K Flow Control	
AT\K[<n>]	Set command controls the RS232 flow control behaviour Parameter: **<n>** 0 - no flow control 1 - hardware mono-directional flow control (only **CTS** active) 2 - software mono-directional flow control (**XON/XOFF**) 3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default) 4 - software bi-directional with filtering (**XON/XOFF**) 5 - pass through: software bi-directional without filtering (**XON/XOFF**) 6 - both hardware bi-directional flow control (both **RTS/CTS** active) and software bi-directional flow control (**XON/XOFF**) with filtering Note: **Set command has no effect is included only for backward compatibility**

&K Flow Control	
	Note: Flow control is always **hardware bi-directional flow control (both RTS/CTS** active**)** Note: **&K** has no Read Command. To verify the current setting of &K, simply check the settings of the active profile issuing **AT&V**. Note: Hardware flow control (**AT&K3**) is not active in command mode.

3.5.2.2.11. Data Set Ready (DSR) Control - &S

&S - Data Set Ready (DSR) Control	
AT&S[<n>]	Set command controls the RS232 **DSR** pin behaviour. Parameter: **<n>** 0 - always **High** 1 - follows the GSM traffic channel indication. 2 - **High** when connected 3 - **High** when device is ready to receive commands (factory default). Note: if option 1 is selected then **DSR** is tied **High** when the device receives from the network the UMTS traffic channel indication. Note: in power saving mode the **DSR** pin is always tied **Low** Note: if parameter is omitted, the command has the same behaviour of **AT&S0**

3.5.2.2.12. Ring (RI) Control - \R

\R - Ring (RI) Control	
AT\R[<n>]	Set command controls the **RING** output pin behaviour. Parameter: **<n>** 0 - **RING** on during ringing and further connection 1 - **RING** on during ringing (factory default) 2 - **RING** follows the ring signal Note: to check the ring option status use the **&V** command. Note: if parameter is omitted, the command has the same behaviour of **AT\R0**

3.5.2.3. Call Control

3.5.2.3.1. Dial - D

D – Dial	
ATD<number>[;]	The V.24ter dial command D lists characters that may be used in a dialing string for making a call or controlling supplementary services in accordance with GSM02.30 and initiates the indicated kind of call. No further commands may follow in the command line. Note: V.25ter Dialing Digits 1 2 3 4 5 6 7 8 9 0 * # + A B C (implementation of these characters is mandatory for GSM/ UMTS). D (implementation of this character is optional for GSM/UMTS, and it is ignored) Note: V.25ter or GSM Modifier Characters • “,”, “T”, “P”, “!”, “W” or “@” are ignored • “;” forces a voice call originated to the given address • “>” allows direct dialing from phonebook • “I” invocation restrict CLI presentation • “i” suppression i.e. allows CLI presentation • “G” or “g” control the CUG supplementary service information for this call (s.+CCUG)
ATD><str> [I] [G] [;]	Originate a call to phone number which corresponding alphanumeric field in the default phonebook is <str>.
ATD>mem<n> [I] [G] [;]	Originate a call to phone number in memory (one of the phonebooks) “mem” entry location <n>. ”mem” may be for example “SM”, “FD” or “LD”.
ATD><n> [I] [G] [;]	Originate a call to phone number in entry location <n> of the default phonebook.
ATDL	This command is used to redial the last dialed number.
Reference	V25ter.

3.5.2.3.2. Answer - A

A - Answer	
ATA	This command instructs the DCE to immediately connect to line and start the answer sequence as specified for the underlying DCE. Any additional command that appears after A on the same command line is ignored. The user is informed that an incoming call is waiting, by the information result code RING or +CRING displayed on TE.
Reference	V25ter.

3.5.2.3.3. Disconnect - H

H - Disconnect	
ATH	Execution command is used to close the current conversation (voice, data or fax). Note: this command can be issued only in command mode; when a data

H - Disconnect	
	conversation is active the device is in on-line mode (commands are not sensed and characters are sent to the other party), hence escape sequence (see **register S2**) is required before issuing this command, otherwise if **&D1** option is active, **DTR** pin has to be tied **Low** to return in command mode.
Reference	V25ter.

3.5.2.3.4. Guard Tone - &G

&G - Guard Tone	
AT&G	Set command has no effect is included only for backward compatibility with landline modems.

3.5.2.3.5. Sync/Async Mode - &Q

&Q - Sync/Async Mode	
AT&Q	Set command has no effect is included only for backward compatibility with landline modems.

3.5.2.4. Modulation Control

3.5.2.4.1. Modulation Selection - +MS

+MS - Modulation Selection	
AT+MS= <carrier> [,<automode> [,<min_rate> [,<max_rate>]]]	Set command has no effect is included only for backward compatibility with landline modems. Parameters: **<carrier>** - a string which specifies the preferred modem carrier to use in originating or answering a connection V21 V22 V22B V23C V32 V34 **<automode>** - it enables/disables automatic modulation negotiation. 0 - disabled 1 - enabled. It has effect only if it is defined for the associated modulation. **<min_rate>** - it specifies the lowest value at which the **DCE** may establish a connection. 0 - unspecified **<max_rate>** - it specifies the highest value at which the **DCE** may establish a connection. 0 - unspecified 300..14400 - rate in bps Note: to change modulation requested use **+CBST** command.
AT+MS?	Read command returns the current value of **<carrier>**, **<automode>**, **<min_rate>**, **<max_rate>** parameters.
AT+MS=?	Test command returns all supported values of the **<carrier>**, **<automode>**, **<min_rate>**, **<max_rate>** parameters.

3.5.2.4.2. Line Quality Monitor And Auto Retrain Or Fallback/Fallforward - %E

%E - Line Quality Monitor And Auto Retrain Or Fallback/Fallforward	
AT%E<n>	Execution command has no effect and is included only for backward compatibility with landline modems.

3.5.2.5. S Parameters

Basic commands that begin with the letter "**S**" are known as "**S-Parameters**". The number following the "**S**" indicates the "parameter number" being referenced. If the number is not recognized as a valid parameter number, an **ERROR** result code is issued.

If no value is given for the subparameter of an **S-Parameter**, an **ERROR** result code will be issued and the stored value left unchanged.

Note: what follows is a special way to select and set an **S-parameter**:

1. **ATS*n*<CR>** selects ***n*** as current parameter number. If the value of ***n*** is in the range (0, 2, 3, 4, 5, 7, 10, 12, 25, 30, 38), this command establishes **S*n*** as last selected parameter. Every value out of this range and less than 256 can be used but has no meaning and is maintained only for backward compatibility with landline modems.
2. **AT=<value><CR>** or **ATS=<value><CR>** set the contents of the selected **S-parameter**

Example:

ATS7<CR>	establishes **S7** as last selected parameter.
AT=40<CR>	**sets the contents of S7 to 40**
ATS=15<CR>	**sets the contents of S7 to 15**

3. AT? Returns the current value of the last S-parameter accessed.

Reference	V25ter and RC56D/RC336D

3.5.2.5.1. Number Of Rings To Auto Answer - S0

S0 - Number Of Rings To Auto Answer	
ATS0=[<n>]	Set command sets the number of rings required before device automatically answers an incoming call. Parameter: **<n>** - number of rings 0 - auto answer disabled (factory default) 1..255 - number of rings required before automatic answer.
ATS0?	Read command returns the current value of **S0 parameter**.
Reference	V25ter

3.5.3. 3GPP TS 27.007 AT Commands

3.5.3.1. General

3.5.3.1.1. Request Manufacturer Identification - +CGMI

+CGMI - Request Manufacturer Identification	
AT+CGMI	Execution command returns the device manufacturer identification code without command echo.
AT+CGMI=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

3.5.3.1.2. Request Model Identification - +CGMM

+CGMM - Request Model Identification	
AT+CGMM	Execution command returns the device model identification code without command echo.
AT+CGMM=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

3.5.3.1.3. Request Revision Identification - +CGMR

+CGMR - Request Revision Identification	
AT+CGMR	Execution command returns device software revision number without command echo.
AT+CGMR=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

3.5.3.1.4. Request Product Serial Number Identification - +CGSN

+CGSN - Request Product Serial Number Identification	
AT+CGSN	Execution command returns the product serial number, identified as the IMEI of the mobile, without command echo.
AT+CGSN=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

3.5.3.1.5. Select TE Character Set - +CSCS

+CSCS - Select TE Character Set	
AT+CSCS=[<chset>]	Set command sets the current character set used by the device. Parameter: **<chset>** - character set "GSM" GSM 7 bit default alphabet (3GPP TS 23.038 [25]); this setting causes easily software flow control (XON/XOFF) problems. "HEX" Character strings consist only of hexadecimal numbers from 00

+CSCS - Select TE Character Set	
	to FF; e.g. “032FE6” equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done. “IRA” International reference alphabet (ITU-T T.50 [13]). (factory default) “UCS2” 16-bit universal multiple-octet coded character set (ISO/IEC10646 [32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. “004100620063” equals three 16-bit characters with decimal values 65, 98 and 99.
AT+CSCS?	Read command returns the current value of the active character set.
AT+CSCS=?	Test command returns the supported values for parameter **<chset>**.
Reference	3GPP TS 27.007

3.5.3.1.6. Request International Mobile Subscriber Identity (IMSI) - +CIMI

+CIMI - Request International Mobile Subscriber Identify (IMSI)	
AT+CIMI	Execution command returns the value of the Internal Mobile Subscriber Identity stored in the SIM without command echo. Note: a SIM card must be present in the SIM card housing, otherwise the command returns **ERROR**.
AT+CIMI=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

3.5.3.2. Call Control

3.5.3.2.1. Hang Up Call - +CHUP

+CHUP - Hang Up Call	
AT+CHUP	This execution command causes TA to hang up the current call of the ME. Note: all active call will be released but neither waiting or held calls.
AT+CHUP=?	Test command returns the **OK** result code
Reference	GSM 07.07

3.5.3.2.2. Select type of address - +CSTA

+CSTA - Select type of address	
AT+CSTA=[<type>]	Set command selects the type of number for further dialling commands (D) according to GSM/UMTS specifications. Parameter: **<type>:** type of address octet in integer format (refer TS 24.008 [8] subclause 10.5.4.7); default 145 when dialling string includes international access code character "+", otherwise 129
AT+CSTA?	Read command returns selected **<type>**
AT+CSTA =?	Test command returns supported **<type>**s
Reference	3GPP TS 27.007

3.5.3.2.3. Select Bearer Service Type - +CBST

+CBST - Select Bearer Service Type	
AT+CBST= **[<speed>** **[,<name>** **[,<ce>]]]**	Set command sets the bearer service **<name>** with data rate **<speed>**, and the connection element **<ce>** to be used when data calls are originated. This setting is also used during mobile terminated data call setup. Parameters: **<speed>** : data rate 0 - autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and nontransparent service) 4 - 2400 bps (V.22bis) 5 - 2400 bps (V.26ter) 6 - 4800 bps (V.32) 7 - 9600 bps (V.32) 12 - 9600 bps (V.34) 14 - 14400 bps (V.34) 15 - 19200 bps (V.34) 16 - 28800 bps (V.34)

+CBST - Select Bearer Service Type	
	17 - 33600 bps (V.34) 39 - 9600 bps (V.120) 43 - 14400 bps (V.120) 47 - 19200 bps (V.120) 48 - 28800 bps (V.120) 49 - 38400 bps (V.120) 50 - 48000 bps (V.120) 51 - 56000 bps (V.120) 68 - 2400 bps (V.110 or X.31 flag stuffing) 70 - 4800 bps (V.110 or X.31 flag stuffing) 71 - 9600 bps (V.110 or X.31 flag stuffing) 75 - 14400 bps (V.110 or X.31 flag stuffing) 79 - 19200 bps (V.110 or X.31 flag stuffing) 80 - 28800 bps (V.110 or X.31 flag stuffing) 81 - 38400 bps (V.110 or X.31 flag stuffing) 82 - 48000 bps (V.110 or X.31 flag stuffing) 83 - 56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service in order to get FTM) 84 - 64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM) 115 - 56000 bps (bit transparent) 116 - 64000 bps (bit transparent) 120 - 32000 bps (PIAFS32k) 121 - 64000 bps (PIAFS64k) 130 - 28800 bps (multimedia) 131 - 32000 bps (multimedia) 132 - 33600 bps (multimedia) 133 - 56000 bps (multimedia) 134 - 64000 bps (multimedia) <**name**> : bearer service 0 - data circuit asynchronous (UDI or 3.1 kHz modem) 1 - data circuit synchronous (UDI or 3.1 kHz modem) 4 - data circuit asynchronous (RDI) 5 - data circuit synchronous (RDI) <**ce**> **:** connection element 0 - transparent 1 - non-transparent 2 - both, transparent preferred 3 - both, non-transparent preferred
AT+CBST?	Read command returns current value of the parameters <**speed**>, <**name**> and <**ce**>
AT+CBST=?	Test command returns the supported range of values for the parameters.
Reference	3GPP TS 27.007

3.5.3.2.4. Radio Link Protocol - +CRLP

+CRLP - Radio Link Protocol	
AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>]]]]]	Set command sets Radio Link Protocol (RLP) parameters used when non-transparent data calls are originated Parameters: **<iws>** - IWF window Dimension 1..61 - factory default value is 61 **<mws>** - MS window Dimension 1..61 - default value is 61 **<T1>** - acknowledge timer (10 ms units). 39..255 - default value is 78 **<N2>** - retransmission attempts 1..255 - default value is 6 **<ver> - protocol version** **0**
AT+CRLP?	Read command returns current value of the RLP protocol parameters
AT+CRLP=?	Test command returns supported range of values of the RLP protocol parameters.
Reference	3GPP TS 27.007

3.5.3.2.5. Service Reporting Control - +CR

+CR - Service Reporting Control	
AT+CR=[<mode>]	Set command controls whether or not intermediate result code **+CR** is returned from **TA** to **TE**. Parameter: **<mode>** 0 - disables **+CR** reporting (factory default) 1 - enables **+CR** reporting: the intermediate result code is transmitted at the point during connect negotiation at which the **TA** has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code **CONNECT** is transmitted. Its format is: **+CR: <serv>** where: **<serv>** ASYNC - asynchronous transparent SYNC - synchronous transparent REL ASYNC - asynchronous non-transparent REL SYNC - synchronous non-transparent. Note: this command replaces V.25ter [14] command Modulation Reporting Control (**+MR**), which is not appropriate for use with a UMTS terminal.
AT+CR?	Read command returns whether or not intermediate result code **+CR** is enabled, in the format: **+CR: <mode>**
AT+CR=?	Test command returns the supported range of values of parameter **<mode>**.

+CR - Service Reporting Control	
Reference	3GPP TS 27.007

3.5.3.2.6. Extended Error Report - +CEER

+CEER - Extended Error Report	
AT+CEER	Execution command returns one or more lines of information text **<report>** offering the TA user an extended error report, in the format: **+CEER: <report>** This report regards some error condition that may occur: - the failure in the last unsuccessful call setup (originating or answering) - the last call release - the last unsuccessful GPRS attach or unsuccessful PDP context activation, - the last GPRS detach or PDP context deactivation. Note: if none of this condition has occurred since power up then **"Normal, unspecified"** condition is reported
AT+CEER=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

3.5.3.2.7. Cellular Result Codes - +CRC

+CRC - Cellular Result Codes	
AT+CRC= **[<mode>]**	Set command controls whether or not the extended format of incoming call indication is used. Parameter: **<mode>** 0 - disables extended format reporting (factory default) 1 - enables extended format reporting: When enabled, an incoming call is indicated to the **TE** with unsolicited result code **+CRING: <type>** instead of the normal **RING**. where **<type>** - call type: ASYNC - asynchronous transparent data SYNC - synchronous transparent data REL ASYNC - asynchronous non-transparent data REL SYNC - synchronous non-transparent data FAX - facsimile (TS 62) VOICE - normal voice (TS 11)
AT+CRC?	Read command returns current value of the parameter **<mode>**.

+CRC - Cellular Result Codes	
AT+CRC=?	Test command returns supported values of the parameter **<mode>**.
Reference	3GPP TS 27.007

3.5.3.2.8. Voice Hang Up Control - +CVHU

+CVHU - Voice Hang Up Control	
AT+CVHU= **[<mode>]**	Set command selects whether **ATH** or "**drop DTR**" shall cause a voice connection to be disconnected or not. Parameter: **<mode>** 0 - "**Drop DTR**" ignored but **OK** result code given. **ATH** disconnects. 1 - "**Drop DTR**" and **ATH** ignored but **OK** result code given. 2 - "**Drop DTR**" behaviour according to **&D** setting. **ATH** disconnects (factory default).
AT+CVHU?	Read command reports the current value of the **<mode>** parameter, in the format: **+CVHU: <mode>**
AT+CVHU=?	Test command reports the range of supported values for parameter **<mode>**

3.5.3.3. Network Service Handling

3.5.3.3.1. Subscriber Number - +CNUM

+CNUM - Subscriber Number	
AT+CNUM	Execution command returns the MSISDN (if the phone number of the device has been stored in the SIM card) in the format: **+CNUM: <alpha>,<number>,<type>[<CR><LF>** **+CNUM: <alpha>,<number>,<type>[…]]** where: **<alpha>** - alphanumeric string associated to **<number>**; used character set should be the one selected with **+CSCS**. **<number>** - string containing the phone number in the format **<type>** **<type>** - type of number: 129 - national numbering scheme 145 - international numbering scheme (contains the character "+").
AT+CNUM=?	Test command returns the **OK** result code
Example	AT+CNUM +CNUM: "PHONENUM1","2173848500",129 +CNUM: "FAXNUM","2173848501",129 +CNUM: "DATANUM","2173848502",129
Reference	3GPP TS 27.007

3.5.3.3.2. Read Operator Names - +COPN

+COPN - Read Operator Names	
AT+COPN	Execution command returns the list of operator names from the **ME** in the format: **+COPN: <numeric1>,<alpha1>[<CR><LF>** **+COPN: <numeric2>,<alpha2>[…]]** where: **<numeric*n*>** - string type, operator in numeric format (see **+COPS**) **<alpha*n*>** - string type, operator in long alphanumeric format (see **+COPS**) Note: each operator code **<numeric*n*>** that has an alphanumeric equivalent **<alpha*n*>** in the ME memory is returned
AT+COPN=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.3.3. Network Registration Report - +CREG

+CREG - Network Registration Report	
AT+CREG= **[<mode>]**	Set command enables/disables network registration reports depending on the parameter **<mode>**. Parameter: **<mode>** 0 - disable network registration unsolicited result code (factory default) 1 - enable network registration unsolicited result code 2 - enable network registration unsolicited result code with network Cell identification data If **<mode>=1**, network registration result code reports: **+CREG: <stat>** where **<stat>** 0 - not registered, ME is not currently searching a new operator to register to 1 - registered, home network 2 - not registered, but ME is currently searching a new operator to register to 3 - registration denied 4 -unknown 5 - registered, roaming If **<mode>=2**, network registration result code reports: **+CREG: <stat>[,<Lac>,<Ci>]** where: **<Lac>** - Local Area Code for the currently registered on cell

+CREG - Network Registration Report	
	<Ci> - Cell Id for the currently registered on cell Note: **<Lac>** and **<Ci>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CREG?	Read command reports the **<mode>** and **<stat>** parameter values in the format: **+CREG: <mode>,<stat>[,<Lac>,<Ci>]** Note: **<Lac>** and **<Ci>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CREG=?	Test command returns the range of supported **<mode>**
Example	AT OK at+creg? +CREG: 0,2 OK *(the MODULE is in network searching state)* at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,1 OK *(the MODULE is registered)* at+creg? +CREG: 0,1 OK
Reference	3GPP TS 27.007

3.5.3.3.4. Operator Selection - +COPS

+COPS - Operator Selection	
AT+COPS= **[<mode>** **[,<format>** **[,<oper>>[,< AcT>]]]]**	Set command forces an attempt to select and register the GSM\UMTS network operator. **<mode>** parameter defines whether the operator selection is done automatically or it is forced by this command to operator **<oper>**. The operator **<oper>** shall be given in format **<format>**.

+COPS - Operator Selection	
	Parameters: **<mode>** 0 - Automatic, in this case other fields are ignored and registration is done automatically by ME(default) 1 - Manual. Other parameters like format and operator need to be passed 2 - Deregister from network 3 - It sets <format> value. In this case <format> becomes a mandatory input 4 - Manual / Automatic. In this case if manual selection fails then automatic mode is entered **<format>** 0 - <oper> format presentations are set to long alphanumeric. If Network name not available it displays combination of Mcc and MNC in string format. 1 - <oper> format presentation is set to short alphanumeric. 2 - <oper> format presentations set to numeric. **<oper>** string type given in format <format>; this field may be up to 16 characters long for long alphanumeric format and up to 8 characters for short alphanumeric format. Numeric format is 5 or 6 Characters long because it depends on MCC/MNC. MCC is only 3 digits. But MNC is 2 or 3 digits. **<AcT>** access technology selected: 0 GSM 2 UTRAN
AT+COPS?	Read command returns current value of **<mode>**,**<format>** and **<oper>** in format **<format>**; if no operator is selected, **<format>** and **<oper>** are omitted **+COPS: <mode>[,<format>,<oper>[,< AcT>]]**
AT+COPS=?	Test command returns a list of quintuplets, each representing an operator present in the network. The quintuplets in the list are separated by commas: **+COPS:** : [list of supported (<stat>,long alphanumeric <oper> ,short alphanumeric <oper>,numeric <oper>,< AcT>)s] [,,(list of supported <mode>s),(list of supported <format>s)] where: **<stat>** - operator availability 0 - unknown 1 - available 2 - current 3 - forbidden **<AcT>** access technology selected: 0 GSM 1 GSM Compact 2 UTRAN

+COPS - Operator Selection	
	Note: since with this command a network scan is done, this command may require some seconds before the output is given.
Example	AT+COPS? +COPS: 0,0,"Test PLMN 1-1",0 OK at+cops=? +COPS: (2,"","","45008",2),(1,"Test PLMN 1-1","Test1-1","00101",0),(3,"","","45005",2),,(0-4),(0-2) OK
Reference	3GPP TS 27.007

3.5.3.3.5. Facility Lock/Unlock - +CLCK

+CLCK - Facility Lock/Unlock	
AT+CLCK= <fac>,<mode> [,<passwd> [,<class>]]	This command is used to lock, unlock or interrogate a MT or a network facility **<fac>**. Password is normally needed to do such actions. Parameters: **<fac>** values reserved by the present document: **"SC"** SIM(lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lockcommand issued) **"AO"** BAOC (Barr All Outgoing Calls) **"OI"** BOIC (Barr Outgoing International Calls) **"OX"** BOIC-exHC (Barr Outgoing International Calls except to Home Country) **"AI"** BAIC (Barr All Incoming Calls) **"IR"** BIC-Roam (Barr Incoming Calls when Roaming outside the home country) **"AB"** All Barring services **"AG"** All outgoing barring services **"AC"** All incoming barring services **"FD"** SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) **"PS"** PH-SIM (lock Phone to SIM card) **"PN"** network Personalisation **"PU"** network subset Personalisation **"PP"** service Provider Personalization (refer 3GPP TS 22.022 [33]) **"PC"** Corporate Personalization (refer 3GPP TS 22.022 [33]) **"PF"** lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted) **<mode>** 0 unlock

+CLCK - Facility Lock/Unlock	
	1 lock 2 query status **<passwd>** string type; shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD **<class>** is a sum of integers each representing a class of information (default 7): 1 voice (telephony) 2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) 4 fax (facsimile services) 8 short message service 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access Note: when **<mode>**=2 and command successful: OK +CLCK: <status>[,<class1> [<CR><LF> +CLCK: <status>,<class2> […]] where **<status>** - the current status of the facility 0 - not active 1 - active **<class*n*>** - class of information of the facility
AT+CLCK=?	Test command reports all the facilities supported by the device.
Reference	3GPP TS 27.007
Example	*Querying such a facility returns an output on three rows, the first for voice, the second for data, the third for fax:* AT+CLCK =”AO”,2 +CLCK: <status>,1 +CLCK: <status>,2 +CLCK: <status>,4

3.5.3.3.6. Change Facility Password - +CPWD

+CPWD - Change Facility Password	
AT+CPWD=<fac>, <oldpwd>, <newpwd>	This command is used to set a new password for the facility lock function defined by command +CLCK. Parameters: **<fac>** - “P2” and other values as defined for +CLCK

+CPWD - Change Facility Password	
	<oldpwd> - string type, it shall be the same as password specified for the facility from the ME user interface or with command **+CPWD**. **<newpwd>** - string type, it is the new password Note: parameter **<oldpwd>** is the old password while **<newpwd>** is the new one.
AT+CPWD=?	Test command returns a list of pairs **(<fac>,<pwdlength>)** which presents the available facilities and the maximum length of their password (**<pwdlength>**)
Example	at+cpwd=? +CPWD: (“SC”,8”),(“P2”,8),(“AO”,4),(“OI”,4),(“OX”,4),(“AI”,4),(“IR”,4),(“AB”,4),(“AG”,4),(“AC”,4) OK
Reference	3GPP TS 27.007

3.5.3.3.7. Calling Line Identification Presentation - +CLIP

+CLIP - Calling Line Identification Presentation	
AT+CLIP=[<n>]	Set command enables/disables the presentation of the CLI (Calling Line Identity) at the **TE**. This command refers to the UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the CLI of the calling party when receiving a mobile terminated call. Parameters: **<n>** 0 - disables CLI indication (factory default) 1 - enables CLI indication If enabled the device reports after each RING the response: **+CLIP: <number>,<type>,””,128,<alpha>,<CLI_validity>** where: **<number>** - string type phone number of format specified by **<type>** **<type>** - type of address octet in integer format 128 - both the type of number and the numbering plan are unknown 129 - unknown type of number and ISDN/Telephony numbering plan 145 - international type of number and ISDN/Telephony numbering plan (contains the character "+") **<alpha>** - string type; alphanumeric representation of **<number>** corresponding to the entry found in phonebook; used character set should be the one selected with command Select **TE** character set **+CSCS**. **<CLI_validity>** 0 - CLI valid 1 - CLI has been withheld by the originator. 2 - CLI is not available due to interworking problems or limitation or originating network.

+CLIP - Calling Line Identification Presentation	
	Note: in the **+CLIP:** response they are currently not reported either the **subaddress** information (it's always **""** after the 2nd comma) and the **subaddress type** information (it's always **128** after the 3rd comma)
AT+CLIP?	Read command returns the presentation status of the CLI in the format: **+CLIP: <n>,<m>** where: **<n>** 0 - CLI presentation disabled 1 - CLI presentation enabled **<m>** - status of the CLIP service on the UMTS network 0 - CLIP not provisioned 1 - CLIP provisioned 2 - unknown (e.g. no network is present) Note: This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.
AT+CLIP=?	Test command returns the supported values of parameter **<n>**
Reference	3GPP TS 27.007
Note	The command changes only the report behaviour of the device, it does not change CLI supplementary service setting on the network.

3.5.3.3.8. Calling Line Identification Restriction - +CLIR

+CLIR - Calling Line Identification Restriction	
AT+CLIR=[<n>]	Set command overrides the CLIR subscription when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. This command refers to CLIR-service (3GPP TS 02.81/21.081) that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call. Parameter: **<n>** - facility status on the Mobile 0 - CLIR facility according to CLIR service network status 1 - CLIR facility active (CLI not sent) 2 - CLIR facility not active (CLI sent)
AT+CLIR?	Read command gives the default adjustment for all outgoing calls (**<n>**) and also triggers an interrogation of the provision status of the CLIR service (**<m>**), where **<n>** - facility status on the Mobile 0 - CLIR facility according to CLIR service network status 1 - CLIR facility active (CLI not sent) 2 - CLIR facility not active (CLI sent) **<m>** - facility status on the Network 0 - CLIR service not provisioned 1 - CLIR service provisioned permanently

+CLIR - Calling Line Identification Restriction	
	2 - unknown (e.g. no network present, etc.) 3 - CLI temporary mode presentation restricted 4 - CLI temporary mode presentation allowed
AT+CLIR=?	Test command reports the supported values of parameter **<n>**.
Reference	3GPP TS 27.007
Note	This command sets the default behaviour of the device in outgoing calls.

3.5.3.3.9. Connected line identification presentation - +COLP

+COLP - Connected line identification presentation	
AT+COLP=[<n>]	Set command enables or disables the presentation of the COL at the TE Parameter: **<n>** 0 – disable (factory default) 1 - enable Note: When enabled (and called subscriber allows), +COLP: <number>,<type>[,<subaddr>,<satype> [,<alpha>]] intermediate result code is returned from TA to TE before any +CR or V.25ter [14] responses. It is manufacturer specific if this response is used when normal voice call is established.
AT+COLP?	Read command gives the status of <n>, and also triggers an interrogation of the provision status of the COLP service according 3GPP TS 22.081 [3] (given in <m>). +COLP: <n>,<m> Where, **<n>** 0 – disable 1 – enable **<m>** 0 - COLP not provisioned 1 - COLP provisioned 2 - unknown (e.g. no network, etc.)
AT+COLP=?	Test command returns supported parameters **<n>**
Reference	3GPP TS 27.007

3.5.3.3.10. Call Forwarding Number And Conditions - +CCFC

+CCFC - Call Forwarding Number And Condition	
AT+CCFC=<reason>,<cmd>[,<number>[,<type>[,<class>[,,,<time>]]]	Execution command controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported. Parameters: **<reason>**

+CCFC - Call Forwarding Number And Condition	
	0 - unconditional 1 - mobile busy 2 - no reply 3 - not reachable 4 - all calls 5 - all conditional calls **<cmd>** 0 - disable 1 - enable 2 - query status 3 - registration 4 - erasure **<number>** - string type phone number of forwarding address in format specified by **<type>** parameter **<type>** - type of address octet in integer format : 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<class>** - sum of integers each representing a class of information which the command refers to; default 7 (voice + data + fax) 1 - voice (telephony) 2 - data 4 - fax (facsimile services) 8 - short message service 16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access **<time>** - time in *seconds* to wait before call is forwarded; it is valid only when **<reason>** "no reply" is enabled (**<cmd>**=1) or queried (**<cmd>**=2) 1..30 - automatically rounded to a multiple of 5 seconds (default is 20) Note: when **<cmd>=2** and command successful, it returns: **+CCFC: <status>,<class1>[,<number>,<type>[,,,<time>]][<CR><LF>** **+CCFC: <status>,<class2>[,<number>,<type>[,,,<time>]][…]]** where: **<status>** - current status of the network service 0 - not active 1 - active **<class*n*>** - same as **<class>** **<time>** - it is returned only when **<reason>**=2 (“no reply”) and **<cmd>**=2. The other parameters are as seen before.

+CCFC - Call Forwarding Number And Condition	
AT+CCFC=?	Test command reports supported values for the parameter **<reason>**.
Reference	3GPP TS 27.007
Note	When querying the status of a network service **(<cmd>=2)** the response line for 'not active' case **(<status>=0)** should be returned only if service is not active for any **<class>**.

3.5.3.3.11. Call Waiting - +CCWA

+CCWA - Call Waiting	
AT+CCWA= **[<n>[,<cmd>** **[,<class>]]]**	Set command allows the control of the call waiting supplementary service. Activation, deactivation, and status query are supported. Parameters: **<n>** - enables/disables the presentation of an unsolicited result code: 0 - disable 1 - enable **<cmd>** - enables/disables or queries the service at network level: 0 - disable 1 - enable 2 - query status **<class>** - is a sum of integers each representing a class of information which the command refers to; default is 7 (**voice + data + fax**) 1 - voice (telephony) 2 - data 4 - fax (facsimile services) 8 - short message service 16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access Note: the response to the query command is in the format: **+CCWA: <status>,<class1>[<CR><LF>** **+CCWA: <status>,<class2>[…]]** where **<status>** represents the status of the service: 0 - inactive 1 - active **<class*n*>** - same as **<class>** Note: the unsolicited result code enabled by parameter **<n>** is in the format:: **+CCWA: <number>,<type>,<class>,[<alpha>][,<cli_validity>]** where: **<number>** - string type phone number of calling address in format specified by **<type>**

+CCWA - Call Waiting	
	<type> - type of address in integer format **<class>** - see before **<alpha>** - string type; alphanumeric representation of **<number>** corresponding to the entry found in phonebook; used character set should be the one selected with **+CSCS**. **<cli_validity>** 0 - CLI valid 1 - CLI has been withheld by the originator 2 - CLI is not available due to interworking problems or limitations of originating network Note: if parameter **<cmd>** is omitted then network is not interrogated. Note: in the query command the class parameter must not be issued. Note: the difference between call waiting report disabling (**AT+CCWA = 0,1,7**) and call waiting service disabling (**AT+CCWA = 0,0,7**) is that in the first case the call waiting indication is sent to the device by network but this last one does not report it to the **DTE**; instead in the second case the call waiting indication is not generated by the network. Hence the device results busy to the third party in the 2nd case while in the 1st case a ringing indication is sent to the third party. Note: The command **AT+CCWA=1,0** has no effect a non sense and must not be issued..
AT+CCWA?	Read command reports the current value of the parameter **<n>**.
AT+CCWA=?	Test command reports the supported values for the parameter **<n>**.
Reference	3GPP TS 27.007

3.5.3.3.12. Call Holding Services - +CHLD

+CHLD - Call Holding Services	
AT+CHLD=[<n>]	Set command calls can be put on hold, recovered, released, added to conversation, and transferred.This is based on the GSM/UMTS supplementary services HOLD, MPTY (i.e Multi Party) and ECT (Explicit Call Transfer). The interaction of this command with other commands Parameter: **<n>** 0 - release all held calls or set User Determined User Busy for a waiting call; if both exists then only the waiting call will be rejected 1 - release all active calls and accepts the other (held or waiting) Note: In the scenario: An active call, a waiting call and held call, when the active call is terminated, we will make the Waiting call as active. 1X - release a specific call (x specific call number as indicated by +CCLC) 2 - place all active calls (if exist) on hold and accepts the other call (held or waiting). If only one call exists which is active, place it on hold and if only held call exists make it active call 2X - place all active calls on hold except call x with which communication is

+CHLD - Call Holding Services	
	supported 3 - adds a held call to the conversation 4 - connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer)(ECT). 6 - puts an active call on hold or an held call to active, while another call is waiting 7 - disconnect users in multiparty without accepting incoming call 8 - release all calls
AT+CHLD=?	Test command returns the list of supported **<n>s**. **+CHLD: (0,1,1X,2,2X,3)**
Reference	3GPP TS 27.007
Note	ONLY for VOICE calls

3.5.3.3.13. Unstructured Supplementary Service Data - +CUSD

+CUSD - Unstructured Supplementary Service Data	
AT+CUSD=[<n>[,<str>[,<dcs>]]]	Set command allows control of the Unstructured Supplementary Service Data (USSD [3GPP TS 02.90/22.090]). Parameters: **<n>** - is used to disable/enable the presentation of an unsolicited result code. 0 - disable the result code presentation in the **DTA** 1 - enable the result code presentation in the **DTA** 2 - cancel an ongoing USSD session (not applicable to read command response) **<str>** - string type USSD-string (when <str> parameter is not given, network is not interrogated) **<dcs>** - indicates Cell Broadcast Data Coding Scheme. Its default value is 0. Note: the unsolicited result code enabled by parameter **<n>** is in the format: **+CUSD: <m>[,<str>,<dcs>]** to the TE where: **<m>**: 0 - no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation). 1 - further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 - USSD terminated by the network 3 - other local client has responded 4 - operation not supported 5 - network time out
AT+CUSD?	Read command reports the current value of the parameter **<n>**
AT+CUSD=?	Test command reports the supported values for the parameter **<n>**
Reference	3GPP TS 27.007

+CUSD - Unstructured Supplementary Service Data	
Note	Only mobile initiated operations are supported

3.5.3.3.14. Advice Of Charge - +CAOC

+CAOC - Advice Of Charge	
AT+CAOC= <mode>	Set command refers to the Advice of Charge supplementary services that enable subscriber to get information about the cost of calls; the command also includes the possibility to enable an unsolicited event reporting of the Current Call Meter (CCM) information. Parameter: **<mode>** 0 - query CCM value 1 - disables unsolicited CCM reporting 2 - enables unsolicited CCM reporting Note: the unsolicited result code enabled by parameter **<mode>** is in the format: **+CCCM: <ccm>** where: **<ccm>** - current call meter in home units, string type: three bytes of the CCM value in hexadecimal format (e.g. "00001E" indicates decimal value 30)
AT+CAOC?	Read command reports the value of parameter **<mode>** in the format: **+CAOC: <mode>**
AT+CAOC=?	Test command reports the supported values for **<mode>** parameter.
Reference	3GPP TS 27.007
Note	**+CAOC** command returns an estimate of the cost of the current call only, produced by the MS and based on the information provided by either AoCI or AOCC supplementary services; it is not stored in the SIM.

3.5.3.3.15. List Current Calls - +CLCC

+CLCC - List Current Calls	
AT+CLCC	Execution command returns the list of current calls and their characteristics in the format: **[+CLCC: <id1>, <dir>, <stat>, <mode>,<mpty>[,<number>,<type>[,<alpha>[,<priority>]]] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>[,<priority>]]] […]]]** where: **<id*n*>** - call identification number

+CLCC - List Current Calls	
	<dir> - call direction 0 - mobile originated call 1 - mobile terminated 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>** - call type 0 - voice 1 - data 2 - fax 9 - unknown **<mpty>** - multiparty call flag 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 phone number octet in integer format 129 - national numbering scheme 145 - international numbering scheme (contains thearacter "+") **<alpha>** - string type; alphanumeric representation of **<number>** corresponding to the entry found in phonebook; used character set should be the one selected with **+CSCS**. **<priority>** - optional digit type parameter indicating the eMLPP priority level of the call, values specified in 3GPP TS 22.067[54]. Note: If no call is active then only **OK** message is sent. This command is useful in conjunction with command **+CHLD** to know the various call status for call holding.
AT+CLCC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.3.16. SS Notification - +CSSN

+CSSN - SS Notification	
AT+CSSN=[<n>[,<m>]]	It refers to supplementary service related network initiated notifications. Set command enables/disables the presentation of notification result codes from **TA** to **TE**. Parameters: **<n>** - sets the **+CSSI** result code presentation status 0 - disable 1 - enable **<m>** - sets the **+CSSU** result code presentation status

+CSSN - SS Notification	
	0 - disable 1 - enable When **<n>**=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code: **+CSSI: <code1>[,<index>]** is sent to **TE** before any other **MO** call setup result codes, where: **<code1>**: 0 - unconditional call forwarding is active 1 - some of the conditional call forwarding are active 2 - call has been forwarded 3 - call is waiting 4 - this is a CUG call (also <index> present) 5 - outgoing calls are barred 6 - incoming calls are barred 7 - CLIR suppression rejected 8 - call has been deflected **<index>**:refer "Closed user group +CCUG" When **<m>=1** and a supplementary service notification is received during a mobile terminated call setup or during a call, an unsolicited result code: **+CSSU: <code2>[<index> [,<number>,<type>]]** is sent to **TE**, where: **<code2>**: 0 - this is a forwarded call (**MT** call setup) 1 - this is a CUG call (<index> present) (MT call setup) 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 (this is not a SS notification) (during a voice call) 6 - forward check SS message received (can be received whenever) 7 - call is being connected (alerting) with the remote party in alerting state in explicit call transfer operation(during a voice call) 8 - call has been connected with the other remote party in explicit call transfer operation (during a voice call or MT call setup) 9 - this is a deflected call (MT call setup) 10 - additional incoming call forwarded **<index>**:refer "Closed user group +CCUG" **<number>**:string type phone of format specified by <type> **<type>**:type of address octet in integer format.
AT+CSSN?	Read command reports the current value of the parameters.
AT+CSSN=?	Test command reports the supported range of values for parameters **<n>**, **<m>**.
Reference	3GPP TS 27.007

3.5.3.3.17. Closed User Group Supplementary Service Control - +CCUG

+CCUG - Closed User Group Supplementary Service Control	
AT+CCUG=[<n>[,<index>[,<info>]]]	Set command allows control of the Closed User Group supplementary service [3GPP TS 02.85/22.085]. Parameters: **<n>** 0 - disable CUG temporary mode (factory default). 1 - enable CUG temporary mode: it enables to control the CUG information on the air interface as a default adjustment for all following outgoing calls. **<index>** 0..9 - CUG index 10 - no index (preferential CUG taken from subscriber data) **<info>** 0 - no information (default) 1 - suppress Outgoing Access (OA) 2 - suppress preferential CUG 3 - suppress OA and preferential CUG
AT+CCUG?	Read command reports the current value of the parameters
AT+CCUG=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.3.18. Preferred Operator List - +CPOL

+CPOL - Preferred Operator List	
AT+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>]]]	This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC(GSM or USIM). Set command writes an entry in the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS. If no list has been previously selected, the User controlled PLMN selector with Access Technology, EFPLMNwAcT, is the one accessed by default. If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. The Access Technology selection parameters, <GSM_AcT>, <GSM_Compact_AcT> and <UTRAN_AcT>, are required when writing User controlled PLMN selector with Access Technology, EF EFPLMNwAcT, Operator controlled PLMN selector with Access Technology EFOPLMNwAcT and HPLMN selector with Access Technology EFHPLMNwAcT. Refer Appendix A for <err> values. Parameters: **<index>** - integer type; the order number of operator in the SIM preferred operator list 1..*n* **<format>**

+CPOL - Preferred Operator List	
	0 – long format alphanumeric **<oper>** 1 – short format alphanumeric **<oper>** 2 - numeric **<oper>** <oper> - string type **<GSM_AcTn>** - GSM access technology 0 – access technology not selected 1 – access technology selected **<GSM_Compact_AcTn>** - GSM compact access technology 0 – access technology not selected 1 – access technology selected **<UTRA_AcTn>** - UTRA acess technology 0 – access technology not selected 1 – access technology selected Note: if **<index>** is given but **<oper>** is left out, entry is deleted. If **<oper>** is given but **<index>** is left out, **<oper>** is put in the next free location. If only **<format>** is given, the format of the **<oper>** in the read command is changed. Currently, **<GSM_Compact_AcT>** is not supported but set value is acceptable.
AT+CPOL?	Read command returns all used entries from the SIM list of preferred operators. their characteristics in the format: +**CPOL:** **<index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>][<CR><LF>+CPOL:** **<index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>] […]]**
AT+CPOL=?	Test command returns the whole **<index>** range supported by the SIM and the range for the parameter **<format>**
Reference	3GPP TS 27.007

3.5.3.3.19. Selection of preferred PLMN list - +CPLS

+CPLS - Selection of preferred PLMN list +CPLS	
AT+CPLS=<list>	Set command select one PLMN selector with Access Technology list in the SIM card or active application in the UICC(GSM or USIM), that is used by +CPOL command. Parameter: **<list>**: 0 - User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC) (Default) 1- Operator controlled PLMN selector with Access Technology EFOPLMNwAcT

+CPLS - Selection of preferred PLMN list +CPLS	
	2 - HPLMN selector with Access Technology EFHPLMNwAcT
AT+CPLS?	Read command returns the selected PLMN selector list from the SIM/USIM +CPLS: <list>
AT+CPLS =?	Test command returns the whole index range supported lists by the SIM./USIM
Reference	3GPP TS 27.007

3.5.3.4. Mobile Equipment Control

3.5.3.4.1. Phone Activity Status - +CPAS

+CPAS - Phone Activity Status	
AT+CPAS	Execution command reports the device status in the form: **+CPAS: <pas>** Where: **<pas>** - phone activity status 0 - ready (device allows commands from **TA/TE**) 1 - unavailable (device does not allow commands from **TA/TE**) 2 - unknown (device is not guaranteed to respond to instructions) 3 - ringing (device is ready for commands from **TA/TE**, but the ringer is active) 4 - call in progress (device is ready for commands from **TA/TE**, but a call is in progress) 5 - asleep (MT is unable to process commands from TA/TE because it is in a low functionality state)
AT+CPAS=?	Test command reports the supported range of values for **<pas>**. Note: although **+CPAS** is an execution command, 3gpp TS 27.007 requires the Test command to be defined.
Example	ATD03282131321; OK AT+CPAS +CPAS: 4 *the called phone has answered to your call* OK ATH OK
Reference	3GPP TS 27.007

3.5.3.4.2. Set Phone Functionality - +CFUN

+CFUN - Set Phone Functionality	
AT+CFUN= **[<fun>[,<rst>]]**	Set command selects the level of functionality in the ME. Parameters: **<fun>** - is the power saving function mode 0 - disable both TX and RX. 1 - mobile full functionality with power saving disabled (factory default) 4 - disable both TX and RX 5 - mobile full functionality with power saving **<rst>** - reset flag 0 - do not reset the ME before setting it to **<fun>** functionality level
AT+CFUN?	Read command reports the current setting of **<fun>**.
AT+CFUN=?	Test command returns the list of supported values for **<fun>** and **<rst>**.

+CFUN - Set Phone Functionality	
Reference	3GPP TS 27.007

3.5.3.4.3. Enter PIN - +CPIN

+CPIN - Enter PIN	
AT+CPIN=<pin> [,<newpin>]	Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN required is SIM PUK or SIM PUK2, the **<newpin>** is required. This second pin, **<newpin>** will replace the old pin in the SIM. Parameters: **<pin>** - pin number as quoted string in the format: "pin". **<newpin>** - new pin number as quoted string in the format: "newpin". To check the status of the PIN request use the command **AT+CPIN?** Note: If all parameters are omitted then the behaviour of Set command is the same as Read command.
AT+CPIN?	Read command reports the PIN/PUK/PUK2 request status of the device in the form: **+CPIN: <code>** where: **<code>** - PIN/PUK/PUK2 request status code READY - ME is not pending for any password SIM PIN - ME is waiting SIM PIN to be given SIM PUK - ME is waiting SIM PUK to be given PH-SIM PIN - ME is waiting phone-to-SIM card password to be given PH-FSIM PIN - ME is waiting phone-to-very first SIM card password to be given PH-FSIM PUK - ME is waiting phone-to-very first SIM card unblocking password to be given SIM PIN2 - ME is waiting SIM PIN2 to be given; this **<code>** is returned only when the last executed command resulted in PIN2 authentication failure (i.e. **+CME ERROR: 17**) SIM PUK2 - ME is waiting SIM PUK2 to be given; this **<code>** is returned only when the last executed command resulted in PUK2 authentication failure (i.e. **+CME ERROR: 18**) PH-NET PIN - ME is waiting network personalization password to be given PH-NET PUK - ME is waiting network personalization unblocking password to be given PH-NETSUB PIN - ME is waiting network subset personalization password to be given PH-NETSUB PUK - ME is waiting network subset personalization unblocking password to be given PH-SP PIN - ME is waiting service provider personalization password to be given PH-SP PUK - ME is waiting service provider personalization unblocking password to be given PH-CORP PIN - ME is waiting corporate personalization password to be given PH-CORP PUK - ME is waiting corporate personalization unblocking password to

<table>
<tr><td colspan="2">+CPIN - Enter PIN</td></tr>
<tr><td></td><td>be given

Note: Pin pending status at startup depends on PIN facility setting, to change or query the default power up setting use the command
AT+CLCK=SC,<mode>,<pin></td></tr>
<tr><td>Example</td><td>AT+CMEE=1
OK
AT+CPIN?
+CME ERROR: 10 error: you have to insert the SIM
AT+CPIN?
+CPIN: READY you inserted the SIM and device is not waiting for PIN to be given

OK</td></tr>
<tr><td>Note</td><td>What follows is a list of the commands which are accepted when ME is pending SIM PIN or SIM PUK

<table>
<tr><td>A</td><td>&K</td><td>+FCLASS</td><td>+CCLK</td></tr>
<tr><td>D</td><td>&N</td><td>+GCAP</td><td>+CALA</td></tr>
<tr><td>H</td><td>&P</td><td>+IPR</td><td>+CALD</td></tr>
<tr><td>O</td><td>&S</td><td>+IFC</td><td>+CRSM</td></tr>
<tr><td>E</td><td>&V</td><td>+ILRR</td><td>+CALM</td></tr>
<tr><td>I</td><td>&W</td><td>+ICF</td><td>+CRSL</td></tr>
<tr><td>L</td><td>&Y</td><td>+MS</td><td>+CLVL</td></tr>
<tr><td>M</td><td>&Z</td><td>+DS</td><td>+CMUT</td></tr>
<tr><td>P</td><td>%E</td><td>+DR</td><td>+CLAC</td></tr>
<tr><td>Q</td><td>%L</td><td>+CGMI</td><td>+CMEE</td></tr>
<tr><td>S</td><td>%Q</td><td>+CGMM</td><td>+CGREG</td></tr>
<tr><td>T</td><td>\Q</td><td>+CGMR</td><td>+CBC</td></tr>
<tr><td>V</td><td>\R</td><td>+GMI</td><td>+CSDH</td></tr>
<tr><td>X</td><td>\V</td><td>+GMM</td><td>+CNMI</td></tr>
<tr><td>Z</td><td>#CGMI</td><td>+GMR</td><td>+CRC</td></tr>
<tr><td>&C</td><td>#CGMM</td><td>+CGSN</td><td></td></tr>
<tr><td>&D</td><td>#CGMR</td><td>+GSN</td><td></td></tr>
<tr><td>&F</td><td>#CGSN</td><td>+CHUP</td><td></td></tr>
<tr><td>+COPS</td><td>#CAP</td><td>+CRLP</td><td></td></tr>
<tr><td>+CLIP</td><td>#SHDN</td><td>+CR</td><td></td></tr>
<tr><td>+CPAS</td><td>#GPIO</td><td>+CPIN</td><td></td></tr>
<tr><td>#ADC</td><td>+CREG</td><td>+CSQ</td><td></td></tr>
</table>

All the above commands, but the ones in the grayed cells, can be issued even if the SIM card is not inserted yet.

All the above commands, but +CSDH and +CNMI, can be issued even if ME is waiting for phone-To-SIM card password to be given</td></tr>
</table>

+CPIN - Enter PIN	
Reference	3GPP TS 27.007

3.5.3.4.4. Signal Quality - +CSQ

+CSQ - Signal Quality	
AT+CSQ	Execution command reports received signal quality indicators in the form: **+CSQ: <rssi>,<ber>** where **<rssi>** - received signal strength indication 0 - (-113) dBm or less 1 - (-111) dBm 2..30 - (-109)dBm..(-53)dBm / 2 dBm per step 31 - (-51)dBm or greater 99 - not known or not detectable **<ber>** - bit error rate (in percent) 0 - less than 0.2% 1 - 0.2% to 0.4% 2 - 0.4% to 0.8% 3 - 0.8% to 1.6% 4 - 1.6% to 3.2% 5 - 3.2% to 6.4% 6 - 6.4% to 12.8% 7 - more than 12.8% 99 - not known or not detectable
AT+CSQ=?	Test command returns the supported range of values of the parameters **<rssi>** and **<ber>**. Note: although **+CSQ** is an execution command without parameters, 3GPP TS 27.007 requires the Test command to be defined.
Reference	3GPP TS 27.007

3.5.3.4.5. Select Phonebook Memory Storage - +CPBS

+CPBS - Select Phonebook Memory Storage	
AT+CPBS=<storage>,[<password>]	Set command selects phonebook memory storage **<storage>**, which will be used by other phonebook commands. Parameter: **<storage>** values reserved by the present document: **"FD" - SIM/USIM** fixed dialing phonebook **"LD" - SIM/USIM** last dialing phonebook **"ON" - SIM (or MT)** own numbers (MSI storage may be available through +CNUM also). **"SM"** – SIM/UICC phonebook **"BL" -** Blacklist phonebook (delete only) **"EC" - SIM** emergency–call-codes phonebook (read only)

+CPBS - Select Phonebook Memory Storage	
	"AP" - Selected application phonebook. **"BN" – SIM/USIM** barred-dialling-number phonebook (only valid with PIN2) **"SN" – SIM/USIM** service-dialling-number phonebook **<password>** string type value representing the PIN2-code required when selecting PIN2-code locked
AT+CPBS?	Read command returns the actual values of the parameter **<storage>**, the number of occupied records **<used>** and the maximum index number **<total>**, in the format: **+CPBS: <storage>,<used>,<total>** Where: **<storage>**s above **<used>** integer type value indicating the number of used locations in selected memory **<total>** integer type value indicating the total number of locations in selected memory
AT+CPBS=?	Test command returns the supported range of values for the parameters **<storage>**. This response is different according to the range supported by each USIM.
Example	AT+CPBS="SM" // *current phonebook storage is SIM* AT+CPBR=1 +CPBR: 1,"0105872928",129,"James" OK
Reference	3GPP TS 27.007

3.5.3.4.6. Read Phonebook Entries - +CPBR

+CPBR - Read Phonebook Entries	
AT+CPBR= <index1> [,<index2>]	This execution command returns phonebook entries in location number range **<index1>** **<index2>** from the current phonebook memory storage selected with +CPBS. If **<index2>** is left out, only location **<index1>** is returned. **Note**: Wildcard chracters (*, ?) in the phone number of FDN (fixed number phonebook) are allowed. Parameters: **<index1>, <index2>** integer type values in the range of location numbers of phonebook memory Response syntax: **[+CPBR: <index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]] [[...] <CR><LF>+CPBR: <index2>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]]**

+CPBR - Read Phonebook Entries	
	Where: **<index>** integer type values in the range of location numbers of phonebook memory **<number>** string type phone number of format <type> **<type>** type of address octet in integer format **<text>** string type field of maximum length <tlength> **<hidden>** indicates if the entry is hidden or not ? only available, if a UICC with an active USIM application is present 0 phonebook entry not hidden 1 phonebook entry hidden **<group>** string type field of maximum length <glength> **<adnumber>** string type phone number of format <adtype> **<adtype>** type of address octet in integer format (refer TS 24.008[8] subclause 10.5.4.7) **<secondtext>** string type field of maximum length <slength> **<email>** string type field of maximum length <elength>
AT+CPBR=?	Test command returns the supported range of values for parameters **<index*n*>** and the maximum lengths of **<number>** and **<text>** fields, in the format: **+CPBR: (list of supported <index>s),[nlength],[tlength],[<glength>],[<alength>],[<slength>], [<elength>]** **OK** where: **<index>** integer type values in the range of location numbers of phonebook memory **<nlength>** integer type value indicating the maximum length of field **<number>** **<tlength>** integer type value indicating the maximum length of field <text> (40). **<glength>** integer type value indicating the maximum length of field <group> **<alength>** integer type value indicating the maximum length of field <anr> **<slength>** integer type value indicating the maximum length of field <secondtext> **<elength>** integer type value indicating the maximum length of field <email>
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS=”SM” OK AT+CPBS? +CPBS: "SM",1,100 OK AT+CPBR=? +CPBR: (1-100),40,255 OK AT+CPBR=1

+CPBR - Read Phonebook Entries	
	+CPBR: 1,"01048771234",129,"James" OK
Reference	3GPP TS 27.007

3.5.3.4.7. Find Phonebook Entries - +CPBF

+CPBF - Find Phonebook Entries	
AT+CPBF= <findtext>	Execution command returns phonebook entries (from the current phonebook memory storage selected with **+CPBS**) which alphanumeric field start with string **<findtext>**. Parameter: **<findtext>** - string type; used character set should be the one selected with command **+CSCS.** Response syntax: **[+CPBF:<index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]** **<CR><LF>+CPBF:** **<index2>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]]** where: **<index1>, <index2>, <index>**: integer type values in the range of location numbers of phonebook memory **<number>** string type phone number of format <type> **<type>** type of address octet in integer format (refer TS 24.008 [8] subclause 10.5.4.7) **<text>** string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS **<group>** string type field of maximum length <glength>; character set as specified by command Select TE Character Set +CSCS **<adnumber>** string type phone number of format <adtype> **<adtype>** type of address octet in integer format (refer TS 24.008 [8] subclause 10.5.4.7) **<secondtext>** string type field of maximum length <slength>; character set as specified by command Select TE Character Set +CSCS **<email>** string type field of maximum length <elength>; character set as specified by command Select TE Character Set +CSCS **<hidden>** indicates if the entry is hidden or not 0 phonebook entry not hidden 1 phonebook entry hidden

+CPBF - Find Phonebook Entries	
AT+CPBF=?	Test command reports the maximum lengths of **<number>** and **<text>** fields, in the format: **+CPBF:[<nlength>],[<tlength>],[<glength>],[<slength>],[<elength>]** where: **<nlength>** integer type value indicating the maximum length of field <number> **<tlength>** integer type value indicating the maximum length of field <text> **<glength>** integer type value indicating the maximum length of field <group> **<slength>** integer type value indicating the maximum length of field <secondtext> **<elength>** integer type value indicating the maximum length of field <email>
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS="SM" *Selecting phonebook* OK AT+CPBF="J" *Searching for string "J"* +CPBF: 1,"01048771234",129,"James" +CPBF: 2,"0169998888",129,"Jane" OK
Reference	3GPP TS 27.007

3.5.3.4.8. Write Phonebook Entry - +CPBW

+CPBW - Write Phonebook Entry	
+CPBW=[<index>][,<number>[,<type>[,<text>[,<group>[,<adnumber>[,<adtype>[,<secondtext>[,<email>[,<sip_uri>[,<tel_uri>[,<hidden>]]]]]]]]]]	This execution command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with +CPBS. Entry fields written are phone number **<number>** in format **<type>** and **<text>** associated with the number. If all fields except **<index>** are omitted, the corresponding entry is deleted. If the **<index>** is left out or "0", but **<number>** is given, entry is written to the first free location in the phonebook. **Note**: Wildcard chracters (*, ?) in the phone number of FDN (fixed number phonebook) are allowed. Parameters: **<index>** integer type values in range of location numbers of phonebook memory **<number>** string type phone number of format <type> **<type>** type of address octet in integer format **<text>** string type field of maximum length <tlength> **<hidden>** indicates if the entry is hidden or not ? only available, if a UICC with an active USIM application is present 0 phonebook entry not hidden 1 phonebook entry hidden format (refer TS 24.008[8] subclause 10.5.4.7) **<group>** string type field of maximum length <glength> **<adnumber>** string type phone number of format <adtype> **<adtype>** type of address octet in integer format (refer TS 24.008[8] subclause 10.5.4.7)

+CPBW - Write Phonebook Entry	
	<secondtext> string type field of maximum length <slength> **<email>** string type field of maximum length <elength>
AT+CPBW=?	Test command returns location range supported by the current storage as a compound value, the maximum length of **<number>** field, supported number format of the storage and maximum length of **<text>** field. The format is: **+CPBW: (list of supported <index>s),[<nlength>],(list of supported type>s),[<tlength>],[<glength>], [<alength>],[<slength>],[<elength>]** where: **<index>** integer type values in range of location numbers of phonebook memory **<nlength>** integer type value indicating the maximum length of field <number> **<tlength>** integer type value indicating the maximum length of field <text> (40). **<glength>** integer type value indicating the maximum length of field <group> **<alength>** integer type value indicating the maximum length of field <anr> **<slength>** integer type value indicating the maximum length of field <secondtext> **<elength>** integer type value indicating the maximum length of field <email>
Reference	3GPP TS 27.007
Example	AT+CPBW=? +CPBW: (1-100),40,(128-255),255 OK AT+CPBW=6,"18651896699",129,"John" OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.

3.5.3.4.9. Clock Management - +CCLK

+CCLK - Clock Management	
AT+CCLK=<time>	Set command sets the real-time clock of the **ME**. Parameter: **<time>** - current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz" yy - year (two last digits are mandatory), range is (00..99) MM - month (two last digits are mandatory), range is (01..12) dd - day (two last digits are mandatory), available ranges are (01..28) (01..29) (01..30) (01..31) hh - hour (two last digits are mandatory), range is (00..23) mm - minute (two last digits are mandatory), range is (00..59) ss - seconds (two last digits are mandatory), range is (00..59) ±zz - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory), range is -47..+48
AT+CCLK?	Read command returns the current setting of the real-time clock, in the format **<time>**.

+CCLK - Clock Management	
	Note: the three last characters of **<time>**, i.e. the time zone information, are returned by **+CCLK?** only if the **#NITZ** URC *'extended'* format has been enabled (see **#NITZ**).
AT+CCLK=?	Test command returns the **OK** result code.
Example	AT+CCLK="02/09/07,22:30:00+00" OK AT+CCLK? +CCLK: 02/09/07,22:30:25 OK
Reference	3GPP TS 27.007

3.5.3.4.10. Generic SIM Access - +CSIM

+CSIM - Generic SIM Access	
AT+CSIM=<length>, <command>	This command allows a direct control of the SIM by a distant application on the TE. Set command transmits to the MT the <command> it then shall send as it is to the SIM The <response> is returned in the same manner to the TE Parameters: **<length>** integer type; length of the characters that are sent to TE in <command> **<command>** command passed on by MT to SIM in hex format Response syntax: **+CSIM: <length>,<response>** Where: **<length>** integer type; length of the characters that are sent to TE in <response> **<response>** response to the command passed on by the SIM to the MT
AT+CSIM=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011

3.5.3.4.11. Restricted SIM Access - +CRSM

+CRSM - Restricted SIM Access	
AT+CRSM= <command> [,<fileid> [,<P1>,<P2>,<P3> [,<data>]]]	Execution command transmits to the **ME** the SIM **<command>** and its required parameters. **ME** handles internally all **SIM-ME** interface locking and file selection routines. As response to the command, **ME** sends the actual SIM information parameters and response data. Parameters: **<command>** - command passed on by the **ME** to the SIM 176 - READ BINARY

+CRSM - Restricted SIM Access	
	178 - READ RECORD 192 - GET RESPONSE 214 - UPDATE BINARY 220 - UPDATE RECORD 242 - STATUS **<fileid>** - identifier of an elementary data file on SIM. Mandatory for every command except STATUS and may be e.g.. 28471 meaning ACMmax file (6F37) 28423 meaning IMSI file (6F07) 28473 meaning ACM file (6F39) 28481 meaning PUKT file (6F41) 28482 meaning SMS file (6F42) **<P1>**,**<P2>**,**<P3>** - parameter passed on by the **ME** to the SIM; they are mandatory for every command except GET RESPONSE and STATUS 0..255 **<data>** - information to be read/written to the SIM (hexadecimal character format). The response of the command is in the format: **+CRSM: <sw1>,<sw2>[,<response>]** where: **<sw1>**,**<sw2>** - information from the SIM about the execution of the actual command either on successful or on failed execution. **<response>** - on a successful completion of the command previously issued it gives the requested data (hexadecimal character format). It's not returned after a successful UPDATE BINARY or UPDATE RECORD command. Note: this command requires PIN authentication. However commands READ BINARY and READ RECORD can be issued before PIN authentication and if the SIM is blocked (after three failed PIN authentication attempts) to access the contents of the Elementary Files. Note: use only decimal numbers for parameters **<command>**, **<fileid>**, **<P1>**, **<P2>** and **<P3>**.
AT+CRSM=?	Test command returns the **OK** result code
Example	*Read binary, ICCID(2FE2)* *AT+CRSM=176,12258,0,0,10* *+CRSM: 144,0,98285070200110768 6F4* *OK* *Read record, ADN(6F3A)* *AT+CRSM=178,28474,1,4,40*

+CRSM - Restricted SIM Access	
	+CRSM: 144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFF0681105678 9282FFFFFFFFFFFFF *OK* *Update Binary, KcGPRS(6F52)* *AT+CRSM=214,28539,0,0,8,C69018C7958C87* *+CRSM: 144,0* *OK* *Update Record, ADN(6F3A)* *AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFF* *+CRSM: 144,0* *OK* *Status, FPLMN(6F7B)* *AT+CRSM=242,28539* *+CRSM: 144,0,623C820238218410A0000000871002FFFFFFFF8904 0300FFA5118001318103010A3282011E8304000030E08A01058B032F0609C6099 001C0830101830181*
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011

3.5.3.4.12. Alert Sound Mode - +CALM

+CALM - Alert Sound Mode	
AT+CALM= <mode>	Set command is used to select the general alert sound mode of the device. Parameter: **<mode>** 0 - normal mode 1 - silent mode; no sound will be generated by the device, except for alarm sound 2 - stealth mode; no sound will be generated by the device Note: if silent mode is selected then incoming calls will not produce alerting sounds but only the unsolicited messages **RING** or **+CRING**.
AT+CALM?	Read command returns the current value of parameter **<mode>**.
AT+CALM=?	Test command returns the supported values for the parameter **<mode>** as compound value. **+CALM: (0-2)**
Reference	3GPP TS 27.007

3.5.3.4.13. Ringer Sound Level - +CRSL

+CRSL - Ringer Sound Level	
AT+CRSL=<level>	Set command is used to select the incoming call ringer sound level of the device. Parameter: **<level>** - ringer sound level 0 - Off 1 - low 2 - middle 3 - high 4 - progressive
AT+CRSL?	Read command reports the current **<level>** setting of the call ringer in the format: **+CRSL: <level>**
AT+CRSL=?	Test command reports **<level>** supported values as compound value. **+CRSL: (0-4)**
Reference	3GPP TS 27.007

3.5.3.4.14. Loudspeaker Volume Level - +CLVL

+CLVL - Loudspeaker Volume Level	
AT+CLVL=<level>	Set command is used to select the volume of the internal loudspeaker audio output of the device. Parameter: **<level>** - loudspeaker volume 0..*max* - the value of *max* can be read by issuing the Test command **AT+CLVL=?**
AT+CLVL?	Read command reports the current **<level>** setting of the loudspeaker volume in the format: **+CLVL: <level>**
AT+CLVL=?	Test command reports **<level>** supported values range in the format: **+CLVL: (0-*max*)**
Reference	3GPP TS 27.007

3.5.3.4.15. Microphone Mute Control - +CMUT

+CMUT - Microphone Mute Control	
AT+CMUT=<n>	Set command enables/disables the muting of the microphone audio line during a voice call. Parameter: **<n>** 0 - mute off, microphone active (factory default) 1 - mute on, microphone muted. Note: this command is only available during voice call

+CMUT - Microphone Mute Control	
	Note: this command mutes/activates both microphone audio paths, internal mic and external mic.
AT+CMUT?	Read command reports whether the muting of the microphone audio line during a voice call is enabled or not, in the format: **+CMUT: <n>**
AT+CMUT=?	Test command reports the supported values for **<n>** parameter.
Reference	3GPP TS 27.007

3.5.3.4.16. Accumulated Call Meter - +CACM

+CACM - Accumulated Call Meter	
AT+CACM=[<pwd>]	Set command resets the Advice of Charge related Accumulated Call Meter stored in SIM (ACM): it contains the total number of home units for both the current and preceding calls. Parameter: **<pwd>** - to access this command PIN2; if PIN2 has been already input once after startup, it is required no more
AT+CACM?	Read command reports the current value of the SIM ACM in the format: **+CACM: <acm>** where: **<acm>** - accumulated call meter in home units, string type: three bytes of the ACM value in hexadecimal format (e.g. "00001E" indicates decimal value 30) Note: the value **<acm>** is in home units; price per unit and currency are defined with command **+CPUC**
AT+CACM=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.4.17. Accumulated Call Meter Maximum - +CAMM

+CAMM - Accumulated Call Meter Maximum	
AT+CAMM=[<acmmax>[,<pwd>]]	Set command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax). This value represents the maximum number of home units allowed to be consumed by the subscriber. When ACM reaches **<acmmax>** value further calls are prohibited. Parameter: **<acmmax>** - string type containing the accumulated call meter maximum value coded in hexadecimal format under, value zero disables ACMmax feature. **<pwd>** - PIN2; if PIN2 has been already input once after startup, it is required no more
AT+CAMM?	Read command reports the ACMmax value stored in SIM in the format:

+CAMM - Accumulated Call Meter Maximum	
	+CAMM : <acmm> where: **<acmm>** - ACMmax value in home units, string type: three bytes of the ACMmax value in hexadecimal format (e.g. "00001E" indicates decimal value 30)
AT+CAMM=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.4.18. Price per Unit and Currency Table - +CPUC

+CPUC - Price Per Unit And Currency Table	
AT+CPUC=<currency>,<ppu>[,<pwd>]	Set command sets the values of Advice of Charge related Price per Unit and Currency Table stored in SIM (PUCT). The PUCT information can be used to convert the home units (as used in commands **+CAOC**, **+CACM** and **+CAMM**) into currency units. Parameters: **<currency>** - string type; three-character currency code (e.g. "LIT", "L. ", "USD", "DEM" etc..); used character set should be the one selected with command **+CSCS**. **<ppu>** - price per unit, string type (dot is used as decimal separator) e.g. "1989.27" **<pwd>** - SIM PIN2; if PIN2 has been already input once after startup, it is required no more
AT+CPUC?	Read command reports the current values of **<currency>** and **<ppu>** parameters in the format: **+CACM : <currency>,<ppu>**
AT+CPUC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.4.19. Available AT Commands - +CLAC

+CLAC - Available AT Commands	
AT+CLAC	Execution command causes the ME to return the AT commands that are available for the user, in the following format: **<AT cmd1>[<CR><LF><AT cmd2>[…]]** where: **<AT cmd*n*>** - defines the AT command including the prefix **AT**
AT+CLAC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.5.3.4.20. Read ICCID (Integrated Circuit Card Identification) - +CCID

+CCID - Read ICCID	
AT+CCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)
AT+CCID=?	Test command returns the **OK** result code.
Example	AT+CCID 89820507021001676 84F OK

3.5.3.4.21. Alarm Management - +CALA

+CALA - Alarm Management	
AT+CALA=<time>[,<n>[,<type>[,<text>[,<recurr>[,<silent>]]]]]	Set command stores in the internal Real Time Clock an alarm time with respective settings. It is possible to set up a recurrent alarm for one or more days in the week. Currently just one alarm can be set. When the RTC time reaches the alarm time then the alarm starts, the behaviour of the MODULE depends upon the setting **<type>** and if the device was already ON at the moment when the alarm time had come. Parameters: **<time>** - current alarm time as quoted string in the same format as defined for **+CCLK** command (i.e. "yy/MM/dd,hh:mm:ss±zz"), unless the **<recurr>** parameter is used: in this case **<time>** must not contain a date (i.e. "hh:mm:ss±zz") **<n>** - index of the alarm 0 - The only value supported is 0. **<type>** - alarm behaviour type 0 - reserved for other equipment use. 1 - the MODULE simply wakes up fully operative as if the ON/OFF button had been pressed. If the device is already ON at the alarm time, then it does nothing. (Default) 2 - the MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE issues an unsolicited code every 3s: **+CALA: <text>** where **<text>** is the **+CALA** optional parameter previously set. The device keeps on sending the unsolicited code every 3s until a **#WAKE** or **#SHDN** command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down. (default) 3 – Reserved. 4 - the MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE brings the pin

+CALA - Alarm Management	
	GPIO6 high, provided its **<direction>** has been set to alarm output, and keeps it in this state until a **#WAKE** or **#SHDN** command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down. 5 - the MODULE will make both the actions as for type=2 and **<type>=3**. 6 - the MODULE will make both the actions as for type=2 and **<type>=4**. 7 - the MODULE will make both the actions as for type=3 and **<type>=4**. 8 - the MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE sets **High** the **RI** output pin. The **RI** output pin remains **High** until next **#WAKE** issue or until a 90s timer expires. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s. After that it shuts down. **<text>** - unsolicited alarm code text string. It has meaning only if **<type>** is equal to 2 or 5 or 6. **<recurr>** - string type value indicating day of week for the alarm in one of the following formats: "<1..7>[,<1..7>[, …]]" - it sets a recurrent alarm for one or more days in the week; the digits 1 to 7 corresponds to the days in the week (Monday is 1). "0" - it sets a recurrent alarm for all days in the week. **<silent>** - integer type indicating if the alarm is silent or not. 0 - the alarm will not be silent; 1 - the alarm will be silent. Note: a special form of the Set command, +CALA="", deletes an alarm in the ME Note: The "alarm mode" is indicated by hardware pin **CTS** to the **ON** status and **DSR** to the **OFF** status, while the "power saving" status is indicated by a **CTS - OFF** ,**DSR - OFF** and **USB_VBUS – OFF** status. The normal operating status is indicated by **DSR – ON or USB_VBUS – ON status**. During the "alarm mode" the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SMS, the only commands that can be issued to the MODULE in this state are the #WAKE and #SHDN, every other command must not be issued during this state.
AT+CALA?	Read command returns the list of current active alarm settings in the ME, in the format: **[+CALA: <time>,<n>,<type>,[<text>],<recurr>,<silent>]**
AT+CALA=?	Test command returns the list of supported index values (currently just 0), alarm types, maximum length of the text to be displayed, maximum length of **<recurr>** and supported **<silent>**s, in the format: **+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>, <rlength>,(list of supported <silent>s)**
Example	AT+CALA="02/09/07,23:30:00+00" OK
Reference	3gpp TS 27.007

3.5.3.4.22. Delete Alarm - +CALD

+CALD - Delete Alarm	
AT+CALD=<n>	Execution command deletes an alarm in the ME Parameter: **<n>** - alarm index 0
AT+CALD=?	Test command reports the range of supported values for **<n>** parameter.
Reference	3G TS 27.007

3.5.3.5. Mobile Equipment Errors

3.5.3.5.1. Report Mobile Equipment Error - +CMEE

+CMEE - Report Mobile Equipment Error	
AT+CMEE=[<n>]	Set command enables/disables the report of result code: **+CME ERROR: <err>** as an indication of an error relating to the +**Cxxx** commands issued. When enabled, device related errors cause the **+CME ERROR: <err>** final result code instead of the default **ERROR** final result code. **ERROR** is anyway returned normally when the error message is related to syntax, invalid parameters, or **DTE** functionality. Parameter: **<n>** - enable flag 0 - disable **+CME ERROR:<err>** reports, use only **ERROR** report. 1 - enable **+CME ERROR:<err>** reports, with **<err>** in numeric format 2 - enable **+CME ERROR: <err>** reports, with **<err>** in verbose format
AT+CMEE?	Read command returns the current value of subparameter **<n>**: **+CMEE: <n>**
AT+CMEE=?	Test command returns the range of values for subparameter **<n>**
Note	**+CMEE** has no effect on the final result code **+CMS**
Reference	3GPP TS 27.007

3.5.3.6. Voice Control

3.5.3.6.1. DTMF Tones Transmission - +VTS

+VTS - DTMF Tones Transmission	
AT+VTS=<dtmf>[,duration]	Execution command allows the transmission of DTMF tones. Parameters: **<dtmf>** - a single ASCII character in the set (0 9), #,*,(A D); with a duration that

+VTS - DTMF Tones Transmission	
	was defined through +VTD command. **<duration>** - duration of a tone in 1/100 sec.; this parameter can be specified only if the length of first parameter is just one ASCII character 0 - a single DTMF tone will be transmitted for a duration depending on the network, no matter what the current **+VTD** setting is. 1..255 - a single DTMF tone will be transmitted for a time **<duration>** (in 10 ms multiples), no matter what the current **+VTD** setting is. Note: this commands operates in voice mode only (see **+FCLASS**). Note: this command is only available during voice call
AT+VTS=?	Test command provides **<dtmf>** and supported **<duration>s** in the format: **(<dtmf>)[,(supported <duration>)]**
Reference	3GPP TS 27.007 and TIA IS-101

3.5.3.6.2. Tone Duration - +VTD

+VTD - Tone Duration	
AT+VTD= <duration>	Set command sets the length of tones transmitted with **+VTS** command. Parameter: **<duration>** - duration of a tone 0 - the duration of every single tone is dependent on the network (factory default) 1..255 - duration of every single tone in 1/10 sec.
AT+VTD?	Read command reports the current Tone Duration, in the format: **<duration>**
AT+VTD=?	Test command provides the list of supported **<duration>s** in the format: **(list of supported <duration>s)**
Reference	3GPP TS 27.007 and TIA IS-101

3.5.3.7. Commands For GPRS

3.5.3.7.1. GPRS Mobile Station Class - +CGCLASS

+CGCLASS - GPRS mobile station class	
AT+CGCLASS= [<class>]	Set command sets the GPRS class according to **<class>** parameter. Parameter: **<class>** - GPRS class "A" - WCDMA "B" - GSM/GPRS "CG" - class C in GPRS only mode (GPRS only) "CC" - class C in circuit switched only mode (GSM only)

+CGCLASS - GPRS mobile station class	
AT+CGCLASS?	Read command returns the current value of the GPRS class in the format: **+CGLASS: <class>**
AT+CGCLASS=?	Test command reports the range for the parameter **<class>**

3.5.3.7.2. GPRS Attach Or Detach - +CGATT

+CGATT - GPRS Attach Or Detach	
AT+CGATT=[<state>]	Execution command is used to attach the terminal to, or detach the terminal from, the GPRS service depending on the parameter **<state>**. Parameter: **<state>** - state of GPRS attachment 0 - detached 1 - attached
AT+CGATT?	Read command returns the current GPRS service state.
AT+CGATT=?	Test command requests information on the supported GPRS service states.
Example	AT+CGATT? +CGATT: 0 OK AT+CGATT=? +CGATT: (0,1) OK AT+CGATT=1 OK
Reference	3GPP TS 27.007

3.5.3.7.3. GPRS Event Reporting - +CGEREP

+CGEREP - GPRS Event Reporting	
AT+CGEREP= [<mode>[,<bfr>]]	Set command enables or disables sending of unsolicited result codes **+CGEV: XXX** (see below) from **TA** to **TE** in the case of certain events occurring in the Packet Domain. Parameters: **<mode>** - controls the processing of **URCs** specified with this command 0 - Buffer unsolicited result codes in the **TA**. If **TA** result code buffer is full,the oldest one can be discarded. No codes are forwarded to the **TE**. 1 - Discard unsolicited result codes when **TA-TE** link is reserved (e.g. in on-line data mode); otherwise forward them directly to the **TE**. 2 - Buffer unsolicited result codes in the **TA** when **TA-TE** link is reserved (e.g. in on-line data mode) and flush them to the **TE** when **TA-TE** link becomes available; otherwise forward them directly to the **TE**. **<bfr>** 0 - buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered 1 - MT buffer of unsolicited result codes defined within this command is flushed

+CGEREP - GPRS Event Reporting	
	to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)
AT+CGEREP?	Read command returns the current <mode> and <bfr> settings, in the format: **+CGEREP: <mode>,<bfr>**
AT+CGEREP=?	Test command reports the supported range of values for the **+CGEREP** command parameters.
Reference	3GPP TS 27.007

3.5.3.7.4. GPRS Network Registration Status - +CGREG

+CGREG - GPRS Network Registration Status	
AT+CGREG=[<n>]	Set command controls the presentation of an unsolicited result code **+CGREG: (see format below)**. Parameter: **<n>** - result code presentation mode 0 - disable network registration unsolicited result code 1 - enable network registration unsolicited result code; if there is a change in the terminal GPRS network registration status, it is issued the unsolicited result code: **+CGREG: <stat>** where: **<stat>** - registration status 0 - not registered, terminal is not currently searching a new operator to register to 1 - registered, home network 2 - not registered, but terminal is currently searching a new operator to register to 3 - registration denied 4 - unknown 5 - registered, roaming 2 - enable network registration and location information unsolicited result code; if there is a change of the network cell, it is issued the unsolicited result code: **+CGREG: <stat>[,<lac>,<ci>]** where: **<stat>** - registration status (see above for values) **<lac>** - location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>** - cell ID in hexadecimal format.
AT+CGREG?	Read command returns the status of result code presentation mode **<n>** and the integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format:

+CGREG - GPRS Network Registration Status	
	+CGREG: <n>,<stat>
AT+CGREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

3.5.3.7.5. Define PDP Context - +CGDCONT

+CGDCONT - Define PDP Context	
AT+CGDCONT= **[<cid>** **[,<PDP_type>** **[,<APN>** **[,<PDP_addr>** **[,<d_comp>** **[,<h_comp>** **[,<pd1>** **[,…[,pdN]]]]]]]]**	Set command specifies GPRS PDP context parameter values for a GPRS PDP context identified by the (local) context identification parameter, **<cid>** Parameters: **<cid>** - (GPRS PDP Context Identifier) numeric parameter which specifies a particular PDP context definition. 1..*max* - where the value of *max* is returned by the Test command **<PDP_type>** - (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol "IP" - Internet Protocol "IPV6" - Internet Protocol, Version 6(Not supported) **<APN>** - (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. **<PDP_addr>** - a string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the **+CGPADDR** command. **<d_comp>** - numeric parameter that controls PDP data compression 0 - off (default if value is omitted) 1 – on 2 - V.42bis **<h_comp>** - numeric parameter that controls PDP header compression 0 - off (default if value is omitted) 1 – on 2 - RFC1144 (applicable for SNDCP only) 3- RFC2507 4- RFC3095 (applicable for PDCP only) **<pd1>**, …, **<pdN>** - zero to N string parameters whose meanings are specific to the **<PDP_type>** Note: a special form of the Set command, **+CGDCONT=<cid>**, causes the values for context number **<cid>** to become undefined. Note: +CGDCONT command permit define 3 PDP Context Ids at the same time.
AT+CGDCONT?	Read command returns the current settings for each defined GPRS context in the format: **+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,…[,pdN]]][<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,…[,pdN]]][…]]**

+CGDCONT - Define PDP Context	
	If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGDCONT=?	Test command returns values supported as a compound value
Example	AT+CGDCONT=1,"IP","*APN*","10.10.10.10",0,0 OK AT+CGDCONT? +CGDCONT: 1,"IP","*APN*","10.10.10.10",0,0 OK AT+CGDCONT=? +CGDCONT: (1-16),"IP",,,(0-2),(0-4) +CGDCONT: (1-16),"IPV6",,,(0-2),(0-4) - (Not supported) OK
Reference	3GPP TS 27.007

3.5.3.7.6. Quality Of Service Profile (Minimum Acceptable) - +CGQMIN

+CGQMIN - Quality Of Service Profile (Minimum Acceptable)	
AT+CGQMIN= **[<cid>** **[,<precedence>** **[,<delay>** **[,<reliability>** **[,<peak>** **[,<mean>]]]]]]**	Set command allows to specify a minimum acceptable profile which is checked by the terminal against the negotiated profile returned in the Activate PDP Context Accept message. Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command). **<precedence>** - precedence class **<delay>** - delay class **<reliability>** - reliability class **<peak>** - peak throughput class **<mean>** - mean throughput class If a value is omitted for a particular class then this class is not checked. Note: a special form of the Set command, **+CGQMIN=<cid>** causes the requested profile for context number **<cid>** to become undefined.
AT+CGQMIN?	Read command returns the current settings for each defined context in the format: **+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,** **<mean>[<CR><LF>+CGQMIN: <cid>,<precedence>,** **<delay>,<reliability>,<peak>,<mean>[…]]** If no PDP context has been defined, it has no effect and **ERROR** result code is returned.
AT+CGQMIN=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQMIN: <PDP_Type>,(list of supported <precedence>s),** **(list of supported <delay>s),(list of supported <reliability>s),** **(list of supported <peak>s),(list of supported <mean>s)**

+CGQMIN - Quality Of Service Profile (Minimum Acceptable)	
	Note: only the “IP” PDP_Type is currently supported.
Example	AT+CGQMIN=1,0,0,3,0,0 OK AT+CGQMIN? +CGQMIN: 1,0,0,5,0,0 OK AT+CGQMIN=? +CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31) - (Not supported) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

3.5.3.7.7. 3G Quality Of Service Profile (Minimum Acceptable) - +CGEQMIN

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
AT+CGEQMIN= **[<cid>** **[,<Traffic class>** **[,<Maximum bitrate UL>** **[,<Maximum bitrate DL>** **[,<Guaranteed bitrate UL>** **[,<Guaranteed bitrate DL>** **[,<Delivery order>** **[,<Maximum SDU size>** **[,<SDU error ratio>** **[,<Residual bit error ratio>** **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority>]]]]]]]]]]]]**	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept Message. Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command). **<Traffic class>** - Traffic class 0 - conversational 1 - streaming 2 - interactive 3 - background 4 - subscribed value **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps 576~8640 - in 64 kbps steps **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps 576~8640 - in 64 kbps steps 8700~16000 - in 100 kbps steps **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	64~568 - in 8 kbps steps 576~8640 - in 64 kbps steps <**Guaranteed bitrate DL**> - the guaranteed bitrate down link(kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps 576~8640 - in 64kbps steps 8700~16000 - in 100 kbps steps <**Delivery order**> SDU Delivery oreder 0 - no 1 - yes 2 - subscribed value <**Maximum SDU size**> Maximum SDU size in octets 0 - subscribed value 10~1500 1502 1510 1520 <**SDU error ratio**> SDU error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” <**Residual bit error ratio**> Residual bitt error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “5E2” “1E2” “5E3” “4E3” “1E3” “1E4” “1E5” “1E6” “6E8” <**Delivery of erroneous SDUs**> Delivery of erroneous SDUs 0 - no

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	1 – yes 2 – no detect 3 – subscribed value <**Transfer delay** > Transfer delay (milliseconds) 0 - subscribed value 10~150 - in 10 ms steps 200~950 - in 50 ms steps 1000~4000 - in 50ms steps <**Traffic handling priority** > Traffic handling priority 0- subscribed value 1…3 Note: a special form of the Set command, **+CGEQMIN=<cid>** causes the requested profile for context number **<cid>** to become undefined. Note: +CGEQMIN= command returns ERROR.
AT+CGEQMIN?	Read command returns the current settings for each defined context in the format: **[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling><CR><LF>]** **[+CGEQMIN:…]** If no PDP context has been defined, it has no effect and **ERROR** result code is returned.
AT+CGEQMIN=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQMIN: <PDP_Type>,(list of supported <Traffic class>s),** **(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s**
Example	AT+CGEQMIN=1,0,384,384,128,128,0,0,”0E0”,”0E0”,0,0,0 OK AT+CGEQMIN? +CGEQMIN: 1,0,384,384,128,128,0,0,”0E0”,”0E0”,0,0,0 OK

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	AT+CGEQMIN=? +CGEQMIN: "IP",(0-4), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps, 8700-16000 in 100 kbps steps), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps, 8700-16000 in 100 kbps steps),(0-2), (0,10-1500,1502,1510,1520), ("1E6","1E5","1E4","1E3","7E3","1E2","1E1","0E0"),("6E8","1E6","1E5","1E4","1E3","4E3","5E3","1E2","5E2","0E0"),(0-3), (0, 10-150 in 10 ms steps, 200-950 in 50 ms steps, 1000-4000 in 50 ms steps), (0-3) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

3.5.3.7.8. Quality Of Service Profile (Requested) - +CGQREQ

+CGQREQ - Quality Of Service Profile (Requested)	
AT+CGQREQ= **[<cid>** **[,<precedence>** **[,<delay>** **[,<reliability>** **[,<peak>** **[,<mean>]]]]]]**	Set command allows to specify a Quality of Service Profile that is used when the terminal sends an Activate PDP Context Request message to the network. It specifies a profile for the context identified by the (local) context identification parameter, **<cid>**. Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command). **<precedence>** - precedence class **<delay>** - delay class **<reliability>** - reliability class **<peak>** - peak throughput class **<mean>** - mean throughput class If a value is omitted for a particular class then this class is not checked. Note: a special form of the Set command, **+CGQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined.
AT+CGQREQ?	Read command returns the current settings for each defined context in the format: **+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,** **<mean>[<CR><LF>+CGQREQ: <cid>,<precedence>,** **<delay>,<reliability>,<peak>,<mean>[…]]** If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQREQ: <PDP_Type>,(list of supported <precedence>s),** **(list of supported <delay>s),(list of supported <reliability>s),** **(list of supported <peak>s),(list of supported <mean>s)** Note: only the "IP" PDP_Type is currently supported.

+CGQREQ - Quality Of Service Profile (Requested)	
Example	AT+CGQREQ? +CGQREQ: 1,0,0,3,0,0 OK AT+CGQREQ=1,0,0,3,0,0 OK AT+CGQREQ=? +CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31) - (Not supported) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

3.5.3.7.9. 3G Quality Of Service Profile (Requested) - +CGEQREQ

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
AT+CGEQREQ= **[<cid>** **[,<Traffic class>** **[,<Maximum bitrate UL>** **[,<Maximum bitrate DL>** **[,<Guaranteed bitrate UL>** **[,<Guaranteed bitrate DL>** **[,<Delivery order>** **[,<Maximum SDU size>** **[,<SDU error ratio>** **[,<Residual bit error ratio>** **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority>]]]]]]]]]]]]**	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network. Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command). **<Traffic class>** - Traffic class 0 - conversational 1 - streaming 2 - interactive 3 - background 4 - subscribed value **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps 576~8640 - in 64 kbps steps **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps 576~8640 - in 64 kbps steps 8700~16000 - in 100 kbps steps **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	576~8640 - in 64 kbps steps <**Guaranteed bitrate DL**> - the guaranteed bitrate down link(kbits/s) 0 - subscribed value 1~63 - in 1 kbps steps 64~568 - in 8 kbps steps 576~8640 - in 64 kbps steps 8700~16000 - in 100 kbps steps <**Delivery order**> SDU Delivery oreder 0 - no 1 - yes 2 - subscribed value <**Maximum SDU size**> Maximum SDU size in octets 0 - subscribed value 10~1500 1502 1510 1520 <**SDU error ratio**> SDU error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” <**Residual bit error ratio**> Residual bitt error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “5E2” “1E2” “5E3” “4E3” “1E3” “1E4” “1E5” “1E6” “6E8” <**Delivery of erroneous SDUs**> Delivery of erroneous SDUs 0 - no 1 – yes

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	2 – no detect 3 – subscribed value <**Transfer delay** > Transfer delay (milliseconds) 0 – subscribed value 10~150 - in 10 ms steps 200~950 - in 50 ms steps 1000~4000 - in 50 ms steps <**Traffic handling priority** > Traffic handling priority 0- subscribed value 1…3 Note: a special form of the Set command, **+CGEQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined. Note: +CGEQREQ= command returns ERROR.
AT+CGEQREQ?	Read command returns the current settings for each defined context in the format: **[+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling><CR><LF>]** **[+CGEQMIN:…]** If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGEQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQREQ: <PDP_Type>,(list of supported <Traffic class>s),** **(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s**
Example	AT+CGEQREQ=1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0 OK AT+CGEQREQ? +CGEQREQ: 1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0 OK AT+CGEQREQ=? +CGEQREQ: "IP",(0-4), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	64 kbps steps), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps, 8700-16000 in 100 kbps steps), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps), (0,1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps, 8700-16000 in 100 kbps steps), (0-2), (0,10-1500,1502,1510,1520), ("1E6","1E5","1E4","1E3","7E3","1E2","1E1","","0E0"),("6E8","1E6","1E5","1E4","5E3","4E3","1E3","5E2","1E2","0E0"),(0-3),(0,10-150 in 10 ms steps, 200-950 in 50 ms steps, 1000-4000 in 50 ms steps),(0-3) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

3.5.3.7.10. PDP Context Activate Or Deactivate - +CGACT

+CGACT - PDP Context Activate Or Deactivate	
AT+CGACT= [<state>[,<cid> [,<cid>[,…]]]]	Execution command is used to activate or deactivate the specified PDP context(s) Parameters: **<state>** - indicates the state of PDP context activation 0 - deactivated 1 - activated **<cid>** - a numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command) Note: if no **<cid>**s are specified the activation/deactivation form of the command activates/deactivates all defined contexts.
AT+CGACT?	Read command returns the current activation state for all the defined PDP contexts in the format: **+CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>[…]]**
AT+CGACT=?	Test command reports information on the supported PDP context activation states parameters in the format: **+CGACT: (0,1)**
Example	AT+CGACT=1,1 OK AT+CGACT? +CGACT: 1,1 OK
Reference	3GPP TS 27.007

3.5.3.7.11. Show PDP Address - +CGPADDR

+CGPADDR - Show PDP Address	
AT+CGPADDR= [<cid>[,<cid> [,…]]]	Execution command returns a list of PDP addresses for the specified context identifiers in the format:

+CGPADDR - Show PDP Address	
	+CGPADDR: <cid>,<PDP_addr>[<CR><LF><CR><LF>+CGPADDR: <cid>,<PDP_addr>[…]] Parameters: **<cid>** - a numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). If no **<cid>** is specified, the addresses for all defined contexts are returned. **<PDP_addr>** - a string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the **+CGDCONT** command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**; **<PDP_addr>** is omitted if none is available
AT+CGPADDR=?	Test command returns a list of defined **<cid>**s.
Example	AT#GPRS=1 +IP: xxx.yyy.zzz.www OK AT+CGPADDR=1 +CGPADDR: 1,"xxx.yyy.zzz.www" OK AT+CGPADDR=? +CGPADDR: (1) OK AT+CGDCONT=1,"IP","xxx.yyy.zzz" OK AT+CGPADDR=1 +CGPADDR: 1,"0,0,0,0" OK
Reference	3GPP TS 27.007

3.5.3.7.12. 3G Quality of Service Profile (Negotiated) - +CGEQNEG

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
AT+CGEQNEG=[<cid>[,<cid>[,…]]]	This command allow the TE to retrieve the negotiated 3G quality of service profiles returned in the Activate PDP Context Accept message. Set command returns the negotiated 3G QoS profile for the specified context identifiers, <cid>s. The Qos profile consists of a number of parameters, each of which may have a separate value. Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command).

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
AT+CGEQNEG=?	Test command returns a list of <cid>s associated with active contexts.
Example	AT+CGEQREQ? +CGEQREQ: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0 OK AT+CGACT=1,1 OK T+CGEQNEG=? +CGEQREQ: (1) OK AT+CGEQNEG=1 +CGEQNEG: 1,3,128,384,0,0,2,1500,"1E4","1E5",3,0,1 OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

3.5.3.7.13. Enter Data State - +CGDATA

+CGDATA - Enter Data State	
AT+CGDATA=[<L2P>[,<cid>]	Execution command causes to perform whatever actions are necessary to establish a communication with the network using one or more GPRS PDP types. Parameters: **<L2P>** - string parameter that indicates the layer 2 protocol to be used "PPP" "M-OPT-PPP" "M-HEX" "M-RAW_IP" "PAD" "X25" **<cid>** - numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). Note: if parameter **<L2P>** is omitted, the layer 2 protocol is "PPP" Note : If cid is omitted, cid is 1(default value)
AT+CGDATA=?	Test command reports information on the supported layer 2 protocols.
Example	AT+CGDATA=? +CGDATA: ("PPP")

+CGDATA - Enter Data State	
	OK AT+CGDATA=”PPP”,1 CONNECT
Reference	3GPP TS 27.007

3.5.3.8. Commands For Battery Charger

3.5.3.8.1. Battery Charge - +CBC

+ CBC - Battery Charge	
AT+CBC	Execution command returns the current Battery Charge status in the format: **+CBC: <bcs>,<bcl>** where: **<bcs>** - battery status 0 - **ME** is powered by the battery **<bcl>** - battery charge level(0 ~ 100) Note: <bcl> indicates battery charge level only if battery is connected and charger is not connected.
AT+CBC=?	Test command returns parameter values supported as a compound value. **+CBC: (0),(0-100)** Note: although **+CBC** is an execution command, 3gpp TS 27.007 requires the Test command to be defined.
Example	AT+CBC +CBC: 0,75 OK
Note	The **ME** does not make differences between being powered by a battery or by a power supply on the **VBATT** pins, so it is not possible to distinguish between these two cases.
Reference	3GPP TS 27.007

3.5.4. 3GPP TS 27.005 AT Commands for SMS and CBS

3.5.4.1. General Configuration

3.5.4.1.1. Select Message Service - +CSMS

+CSMS - Select Message Service	
AT+CSMS= <service>	Execution command selects messaging service **<service>**. It returns the types of messages supported by the ME: **<mt>** for mobile terminated messages, **<mo>** for mobile originated messages and **<bm>** for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: **<err>** shall be returned. See chapter Message Service Failure Result Code for a list of **<err>** values. Parameter: **<service>** 0 - 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] 1 - 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of **<service>** setting 1 is mentioned under corresponding command descriptions. **<mt>,<mo>,<bm>** 0 - type not supported 1 - type supported
AT+CSMS?	Read command reports current service setting along with supported message types in the format: **+CSMS: <service>,<mt>,<mo>,<bm>** where: **<service>** - messaging service **<mt>** - mobile terminated messages support **<mo>** - mobile originated messages support **<bm>** - broadcast type messages support
AT+CSMS=?	Test command reports the supported value of the parameter **<service>**.
Example	AT+CSMS=1 +CSMS: 1,1,1 OK AT+CSMS? +CSMS: 1,1,1,1 OK
Reference	3GPP TS 27.005; 3GPP TS 03.40/23.040; 3GPP TS 03.41/23.041

3.5.4.1.2. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	
AT+CPMS= <mem1>[,<mem2>[,<mem3>]]	Set command selects memory storages **<mem1>**, **<mem2>** and **<mem3>** to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: **<err>** shall be returned. See chapter Message Service Failure Result Code for a list of possible **<err>** values. Parameters: **<mem1>** - memory from which messages are read and deleted "BM" – Broadcast message storage "ME" – SMS memory storage "SM" – (U)SIM SMS memory storage "SR" – Status Report message storage **<mem2>** - memory to which writing and sending operations are made "SM" – SIM SMS memory storage "ME" – SMS memory storage **<mem3>** - memory to which received SMs are preferred to be stored "ME" – SMS memory storage "SM" – (U)SIM SMS memory storage Note: Received CBMs are always stored in "BM" (or some manufacturer specific storage) unless directly forwarded to TE; Received status reports are always stored in "SR" (or some manufacturer specific storage) unless directly forwarded to TE. Note: "ME", "BM", "SR" storages are the volatile memory as RAM; So messages will be disappeared in storages after reboot. And each storages are maximum of 8. The command returns the memory storage status in the format: **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** where: **<used1>** - number of units stored into **<mem1>** **<total1>** - max number of units that **<mem1>** can contain **<used2>** - number of units stored into **<mem2>** **<total2>** max number of units that **<mem2>** can contain **<used3>** - number of units stored into **<mem3>** **<total3>** - max number of units that **<mem3>** can contain
AT+CPMS?	Read command reports the message storage status in the format: **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** where **<mem1>**, **<mem2>** and **<mem3>** are the selected storage memories for

+CPMS - Preferred Message Storage	
	reading, writing and storing respectively.
AT+CPMS=?	Test command reports the supported values for parameters **<mem1>**, **<mem2>** and **<mem3>**
Example	AT+CPMS? +CPMS: "ME",27, 50,"ME",27, 50,"SR",1,20 OK AT+CPMS="SM","ME","SM" +CPMS: 1,20,27, 50,1,20 OK AT+CPMS? +CPMS: "SM",1,20,"ME",27, 50,"SM",1,20 OK
Reference	3GPP TS 27.005

3.5.4.1.3. Message Format - +CMGF

+CMGF - Message Format	
AT+CMGF= [<mode>]	Set command selects the format of messages used with send, list, read and write commands. Parameter: **<mode>** 0 - PDU mode, as defined in 3GPP TS 3.40/23.040 and 3GPP TS 3.41/23.041 (default) 1 - text mode
AT+CMGF?	Read command reports the current value of the parameter **<mode>**.
AT+CMGF=?	Test command reports the supported value of **<mode>** parameter.
Example	AT+CMGF=1 OK
Reference	3GPP TS 27.005

3.5.4.2. Message Configuration

3.5.4.2.1. Service Center Address - +CSCA

+CSCA -Service Center Address	
AT+CSCA= <sca> [,[<tosca>]]	Set command sets the Service Center Address to be used for mobile originated SMS transmissions. Parameter: **<sca>** - string indicating the service center address, as a GSM 04.11 RP SC address Address-Value field in string format (i.e., enclosed by quotes ""), BCD numbers (or GSM default alphabet characters) are converted to characters. **<tosca>** - GSM 04.11 RP SC address Type-of-Address octet in integer format. When this parameter is omitted, If the first character of sca is '+' (IRA 43) default is 145, otherwise default is 129). Note: to use the SM service, is mandatory to set a Service Center Address at which service requests will be directed. Note: in Text mode, this setting is used by send and write commands; in PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into the **<pdu>** parameter equals zero. Note: the current settings are stored through **+CSAS**
AT+CSCA?	Read command reports the current value of the SCA in the format: **+CSCA: <sca>,<tosca>**
AT+CSCA=?	Test command returns the **OK** result code.
Example	AT+CSCA="01029190903",129 OK AT+CSCA? +CSCA: "01029190903",129 OK
Reference	3GPP TS 27.005

3.5.4.2.2. Select service for MO SMS services - +CGSMS

+CGSMS – Select service for MO SMS messages	
AT+CGSMS= [<service>]	The set command is used to specify the service or service preference that the MT wi ll use to send MO SMS messages. Parameters: **<service>** -a numeric parameter which indicates the service or service preference to be used.

+CGSMS – Select service for MO SMS messages	
	0 – Packet Domain 1 - Circuit switched (factory default) 2 – Packet Domain preferred (use circuit switched if GRPS is not available) 3 - Circuit switched preferred (use Packet Domain if circuit switched not available)
AT+CGSMS?	Read command reports the currently selected service or service preference : **+CGSMS: <service>**
AT+CGSMS=?	Test command reports the supported range of values for parameter **<service>**
Reference	3GPP TS 27.007

3.5.4.2.3. Set Text Mode Parameters - +CSMP

+CSMP - Set Text Mode Parameters	
AT+CSMP= **[<fo>** **[,<vp>** **[,<pid>** **[,<dcs>]]]]**	Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. Parameters: **<fo>** - depending on the command or result code: first octet of 3GPP TS 03.40/23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. **<vp>** - depending on SMS-SUBMIT **<fo>** setting: 3GPP TS 23.040 TP-VP either in integer format (default 167) or in time-string format (refer <dt>) or if EVPF is supported, in enhanced format (hexadecimal coded string with double quotes) **<pid>** - 3GPP TS 03.40/23.040 TP-Protocol-Identifier in integer format. **<dcs>** - depending on the command or result code: 3GPP TS 03.38/23.038 SMS Data Coding Scheme (default 0),or Cell Broadcast Data Coding Scheme. Note: the current settings are stored through **+CSAS**
AT+CSMP?	Read command reports the current setting in the format: **+CSMP: <fo>,<vp>,<pid>,<dcs>**
AT+CSMP=?	Test command returns the **OK** result code.
Example	*Set the parameters for an outgoing message with 24 hours of validity period and default properties:* AT+CSMP=17,167,0,0 OK
Reference	3GPP TS 27.005; 3GPP TS 03.40/23.040; 3GPP TS 03.38/23.038

3.5.4.2.4. Show Text Mode Parameters - +CSDH

+CSDH - Show Text Mode Parameters	
AT+CSDH= **[<show>]**	Set command indicates whether detailed header information is shown in text mode result codes or not. Parameter: **<show>** 0 - do not show header values defined in commands **+CSCA** and **+CSMP** (**<sca>**, **<tosca>**, **<fo>**, **<vp>**, **<pid>** and **<dcs>**) nor **<length>**, **<toda>** or **<tooa>** in **+CMT**, **+CMGL**, **+CMGR** result codes for SMS-DELIVERs and SMS-SUBMITs in text mode. For SMS-COMMANDs in **+CMGR** result code do not show **<pid>**, **<mn>**, **<da>**, **<toda>**, **<length>** or **<cdata>** 1 - show the values in result codes
AT+CSDH?	Read command reports the current setting in the format: **+CSDH: <show>**
AT+CSDH=?	Test command reports the supported range of values for parameter **<show>**
Reference	3GPP TS 27.005

3.5.4.2.5. Select Cell Broadcast Message Types - +CSCB

+CSCB -Select Cell Broadcast Message Types	
AT+CSCB= **[<mode>[,<mids>** **[,<dcss>]]]**	Set command controls which CB messages are accepted and those that are rejected. Parameters: **<mode>** - control whether message types that are specified are going to be accepted or rejected 0 - the message types defined by **<mids>** and **<dcss>** are accepted (factory default) 1 - the message types defined by **<mids>** and **<dcss>** are not accepted **<mids>** - Message Identifiers, string type: all different possible combinations of the CBM message identifiers; default is empty string (“”). **<dcss>** - Data Coding Schemes, string type: all different possible combinations of CBM data coding schemes; default is empty string (“”). Note: the current settings are stored through **+CSAS**
AT+CSCB?	Read command reports the current value of parameters **<mode>**, **<mids>** and **<dcss>**.
AT+CSCB=?	Test command returns the range of values for parameter **<mode>**.
Example	AT+CSCB=0, "0,1,5,320-478,922","0-3,5" OK AT+CSCB? +CSCB: 0,"0,1,5,320-478,922","0-3,5" OK
Reference	3GPP TS 27.005, 3GPP TS 03.41/23.041, 3GPP TS 03.38/23.038.

3.5.4.2.6. Save Settings - +CSAS

+CSAS - Save Settings	
AT+CSAS **[=<profile>]**	Execution command saves settings which have been made by the **+CSCA**, **+CSMP** and **+CSCB** commands in local volatile memory. Parameter: **<profile>** 0 - it saves the settings to NVM (factory default). 1..n - SIM profile number; the value of n depends on the SIM and its max is 3. Note: certain settings may not be supported by the SIM and therefore they are always saved to NVM, regardless the value of **<profile>**.
AT+CSAS=?	Test command returns the possible range of values for the parameter **<profile>**.
Reference	3GPP TS 27.005

3.5.4.2.7. Restore Settings - +CRES

+CRES - Restore Settings

+CRES - Restore Settings	
AT+CRES [=<profile>]	Execution command restores message service settings saved by **+CSAS** command from SIM. Parameter: **<profile>** 0 - it restores message service settings from NVM. 1..n - it restores message service settings from SIM. The value of n depends on the SIM and its max is 3. Note: certain settings may not be supported by the SIM and therefore they are always restored from volatile memory (default value), regardless the value of **<profile>**.
AT+CRES=?	Test command returns the possible range of values for the parameter **<profile>**.
Reference	3GPP TS 27.005

3.5.4.3. Message Receiving And Reading

3.5.4.3.1. New Message Indications To Terminal Equipment - +CNMI

+CNMI - New Message Indications To Terminal Equipment	
AT+CNMI=[<mode>[,<mt> [,<bm>[,<ds> [,<bfr>]]]]]	Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active. Parameter: **<mode>** - unsolicited result codes buffering option 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 (e.g. in on-line data mode). Otherwise forward them directly to the TE. 2 - Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. Note: It is possible that ME/TA result code buffer is in volatile memory. In this case messages may get lost if the power of ME/TA is switched off before codes are sent to TE. Thus, it is not recommended to use direct message routing (**<mt>**=2 or 3, **<bm>**=2 or 3, or <ds>=1) with **<mode>** value 0 or 2. **<mt>** - result code indication reporting for SMS-DELIVER Note: the rules for storing received SMs depend on its data coding scheme (refer 3GPP TS 23.038 [2]), preferred memory storage (+CPMS) setting and this value; refer table 1. Note: If AT command interface is acting as the only display device, the ME must support storing of class 0 messages and messages in the message waiting indication group (discard message); refer table 2). 0 - No SMS-DELIVER indications are routed to the TE. 1 - If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the following unsolicited result code: **+CMTI: <mem1>,<index>** where: **<mem1>** - memory storage where the new message is stored "SM" "ME" **<index>** - location on the memory where SMS is stored. 2 - SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group) are routed directly to the TE using the following unsolicited result code: **(PDU Mode)** **+CMT: <alpha>,<length><CR><LF><pdu>** where: **<alpha>** - alphanumeric representation of originator/destination number corresponding to the entry found in MT phonebook; used character set should be the one selected with command +CSCS.

+CNMI - New Message Indications To Terminal Equipment	
	<length> - PDU length **<pdu>** - PDU message **(TEXT Mode)** **+CMT:<oa>,<alpha>,<scts>*[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]*<CR><LF><data>** (the information written in italics will be present depending on **+CSDH** last setting) where: **<oa>** - originating address, string type. **<alpha>** - alphanumeric representation of **<oa>**; used character set should be the one selected with command +CSCS. **<scts>** - arrival time of the message to the SC ***<tooa>***, **<tosca>** - type of number **<oa>** or ***<sca>:*** 129 - number in national format 145 - number in international format (contains the "+") ***<fo>*** - first octet of 3GPP TS 03.40/23.040 ***<pid>*** - Protocol Identifier **<dcs>** - Data Coding Scheme **<sca>** - Service Centre address, string type. ***<length>*** - text length **<data>** - TP-User-Data • If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used and **<fo>** indicates that GSM03.40/23.040 TP-User-Data-Header-Indication is not set (bit 6 of **<fo>** is 0), each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used or **<fo>** indicates that GSM03.40/23.040 TP-User-Data-Header-Indication is set (bit 6 of **<fo>** is 1), each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) Class 2 messages and messages in the message waiting indication group (stored message) result in indication as defined in **<mt>=1**. 3 - Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in **<mt>=2**. Messages of other data coding schemes result in indication as defined in **<mt>=1**. **<bm>** - broadcast reporting option 0 - Cell Broadcast Messages are not sent to the **TE** 1 - If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index> 2 - New Cell Broadcast Messages are sent to the **TE** with the unsolicited result code: **(PDU Mode)** **+CBM: <length><CR><LF><PDU>** where: **<length>** - PDU length

+CNMI - New Message Indications To Terminal Equipment	
	<PDU> - message PDU **(TEXT Mode)** **+CBM:<sn>,<mid>,<dcs>,<pag>,<pags><CR><LF><data>** where: **<sn>** - message serial number **<mid>** - message ID **<dcs>** - Data Coding Scheme **<pag>** - page number **<pags>** - total number of pages of the message **<data>** - CBM Content of Message • If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) 3 - Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1. **<ds>** - SMS-STATUS-REPORTs reporting option 0 - status report receiving is not reported to the **DTE** and messages are stored 1 - the status report is sent to the **DTE** with the following unsolicited result code: **(PDU Mode)** **+CDS: <length><CR><LF><PDU>** where: **<length>** - PDU length **<PDU>** - message PDU **(TEXT Mode)** **+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>** where: **<fo>** - first octet of the message PDU **<mr>** - message reference number **<ra>** - recipient address, string type. **<tora>** - type of number **<ra>** **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU 2 - if a status report is stored, then the following unsolicited result code is sent: **+CDSI: <mem1>,<index>** where: **<mem1>** - memory storage where the new message is stored "SR"

+CNMI - New Message Indications To Terminal Equipment	
	<index> - location on the memory where SMS is stored **<bfr>** - buffered result codes handling method: 0 - **TA** buffer of unsolicited result codes defined within this command is flushed to the **TE** when **<mode>=1..2** is entered 1 - **TA** buffer of unsolicited result codes defined within this command is cleared when **<mode>=1..2** is entered.
AT+CNMI?	Read command returns the current parameter settings for **+CNMI** command in the form: **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>**
AT+CNMI=?	Test command reports the supported range of values for the **+CNMI** command parameters.
Reference	3GPP TS 27.005
Example	AT+CMGF=1 OK AT+CNMI=1,2,0,1,0 OK *Received message from network* +CMT: "+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE

3.5.4.3.2. List Messages - +CMGL

+CMGL - List Messages	
AT+CMGL [=<stat>]	Set command displays message with status value **<stat>** or all messages from message storage **<mem1>** to the TE The parameter type and the command output depend on the last settings of command **+CMGF** (message format to be used) **(PDU Mode)** Parameter: **<stat>** 0 - new message 1 - read message 2 - stored message not yet sent 3 - stored message already sent 4 - all messages. Each message to be listed is represented in the format: **+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>** where: **<index>** - message position in the memory storage list. **<stat>** - status of the message

+CMGL - List Messages	
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS. **<length>** - length of the PDU in bytes **<pdu>** - message in PDU format according to 3GPP TS 3.40/23.040 **(Text Mode)** Parameter: **<stat>** "REC UNREAD" - new message "REC READ" - read message "STO UNSENT" - stored message not yet sent "STO SENT" - stored message already sent "ALL" - all messages. Each message to be listed is represented in the format (the information written in italics will be present depending on +CSDH last setting): **+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>*[,<tooa/toda>,<length>]*<CR><LF> <data>** where **<index>** - message position in the storage **<stat>** - message status **<oa/da>** - originator/destination address, string type. **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS. **<scts>** - TP-Service Centre Time Stamp in Time String Format ***<tooa/toda>*** - type of number **<oa/da>** 129 - number in national format 145 - number in international format (contains the "+") ***<length>*** - text length **<data>** - TP-User-Data • If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) Each message delivery confirm is represented in the format**:** **+CMGL: <index>,<stat>,<fo>,<mr>,,,<scts>,<dt>,<st>** where **<index>** - message position in the storage

+CMGL - List Messages	
	<stat> - message status **<fo>** - first octet of the message PDU **<mr>** - message reference number **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU Note: If status of the message is 'received unread', status in the storage changes to 'received read' before display
AT+CMGL=?	Test command returns a list of supported **<stat>**s
Example	AT+CMGF=1 *Set Text mode* OK AT+CMGL +CMGL: 1,"REC UNREAD","+821020955219",,"07/07/26,20:05:11+36" SMS Test message +CMGL: 2,"REC UNREAD","+821020955219",,"07/07/26,20:05:58+36" SMS Test message... +CMGL: 3,"REC UNREAD","+821020955219",,"07/07/26,20:06:37+36" SMS Test Message.. +CMGL: 4,"REC UNREAD","+821020955219",,"07/07/26,20:07:43+36" TEST MESSAGE.. +CMGL: 5,"REC UNREAD","+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE OK AT+CMGF=0 *Set PDU mode* OK AT+CMGL=2 +CMGL: 0,2,,24 0791280192919030116 40A811056789282000 0A70CF4F29C0E6A97E7F3F0B90C +CMGL: 1,2,,21 0791280192919030116 40A811051652970000 0A709027A794E77B95C2E +CMGL: 26,2,,17 0881280100990102591 1640A811056789282001 4A704C7D1B1DB OK
Reference	3GPP TS 27.005

3.5.4.3.3. Read Message - +CMGR

+CMGR - Read Message	
AT+CMGR=<index>	Set command returns message with location value <index> from message storage **<mem1>** to the TE Parameter: **<index>** - message index.

+CMGR - Read Message	
	The output depends on the last settings of command **+CMGF** (message format to be used) **(PDU Mode)** The output has the following format: **+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>** where **<stat>** - status of the message 0 - new message 1 - read message 2 - stored message not yet sent 3 - stored message already sent **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS. **<length>** - length of the PDU in bytes. **<pdu>** - message in PDU format according to 3GPP TS 3.40/23.040. The status of the message and entire message data unit **<pdu>** is returned. **(Text Mode)** Output format for received messages (the information written in *italics* will be present depending on **+CSDH** last setting)*:* **+CMGR: <stat>,<oa>,<alpha>,<scts>*[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]*<CR><LF><data>** Output format for sent messages: **+CMGR: <stat>,<da>,<alpha>*[,<toda>,<fo>,<pid>,<dcs>*,,*<sca>,<tosca>,<length>]*<CR><LF><data>** Output format for message delivery confirm: **+CMGR: <stat>,<fo>,<mr>,,,<scts>,<dt>,<st>** where: **<stat>** - status of the message "REC UNREAD" - new received message unread "REC READ" - received message read "STO UNSENT" - message stored not yet sent "STO SENT" - message stored already sent **<*fo*>** - first octet of the message PDU **<mr>** - message reference number **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU **<*pid*>** - Protocol Identifier

+CMGR - Read Message	
	<***dcs***> - Data Coding Scheme <**oa**> - Originator address, string type. <**da**> - Destination address, string type. <**alpha**> - string type alphanumeric representation of <**da**> or <**oa**>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS. <***sca***> - Service Centre number <***tooa***>,<***toda*** >,<***tosca***> - type of number <**oa**>,<**da**>,<***sca***> 129 - number in national format 145 - number in international format (contains the "+") <***length***> - text length <**data**> - TP-User_data • If <**dcs**> indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If <**dcs**> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) Note: If status of the message is 'received unread', status in the storage changes to 'received read' before display
AT+CMGR=?	Test command returns the **OK** result code
Example	AT+CMGF=0 AT+CMGR=1 +CMGR: 2,,21 07912801929190301164 0A8110516529700000A709027A794E77B95C2E OK AT+CMGF=1 OK AT+CMGR=3 +CMGR: "REC READ","+821020955219",,"07/07/19,10:06:34+36" test message/..... OK
Reference	3GPP TS 27.005

3.5.4.3.4. New Message Acknowledgement to ME/TA - +CNMA

+CNMA – New Message Acknowledgement	
(PDU Mode) **AT+CNMA [=<n> [,<length> [<CR> PUD is given<ctrl-Z/ESC]]]**	Execution command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE. Note: When +CSMS is set to 1, This command should be sent TA within 15 seconds after a +CMT new message indication, and no +CNMA is needed after timeout, giving +CNMA after timeout will result in +CMS error. CNMI parameters

+CNMA – New Message Acknowledgement	
	will NOT be reset automatically. Parameter: <n> - Type of acknowledgement in PDU mode 0 : send RP-ACK without PDU (same as TEXT mode) 1 : send RP-ACK with optional PDU message. 2 : send RP-ERROR with optional PDU message. <length> : Length of the PDU message. Note : Refer to 3GPP TS 23.040 Recommendation for other PDU negative acknowledgement codes.
(Text Mode) **AT+CNMA**	Only positive acknowledgement to network (RP-ACK) is possible.
(PDU Mode) **AT+CNMA=?**	Test command returns the possible range of values for the parameter <n>
(Text Mode) **AT+CNMA=?**	Test command returns the OK result code.
Example	**(PDU Mode)** *SMS AT commands compatible with 3GPP TS 27.005 Phase 2+ version .* AT+CSMS=1 +CSMS: 1,1,1 OK *Set PDU mode.* AT+CMGF=0 OK AT+CNMI=2,2,0,0,0 OK *Message is received from network.* +CMT: "",70 06816000585426000480980600F170110370537284… *Send positive acknowledgement to the network.* AT+CNMA=0 OK *Message is received from network.* +CMT: "",70 06816000585426000480980600F170110370537284… *Send negative acknowledgement(Unspecified error) to the network.*

+CNMA – New Message Acknowledgement	
	AT+CNMA=2,3<CR> > 00FF00 <Ctrl-Z> OK **(Text Mode)** *SMS AT commands compatible with 3GPP TS 27.005 Phase 2+ version .* AT+CSMS=1 +CSMS: 1,1,1 OK *Set Text mode.* AT+CMGF=1 OK AT+CNMI=2,2,0,0,0 OK *Message is received from network.* +CMT: "+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE *Send positive acknowledgement to the network.* AT+CNMA OK
Reference	3GPP TS 27.005

3.5.4.4. Message Sending And Writing

3.5.4.4.1. Send Message - +CMGS

+CMGS - Send Message	
(PDU Mode) **AT+CMGS= <length>**	**(PDU Mode)** Execution command sends to the network a message. Parameter: **<length>** - length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length). 7..164 After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** and waits for the specified number of bytes. Note: the **PDU** shall be hexadecimal format (each octet of the **PDU** is given as two IRA character long hexadecimal number) and given in one line. Note: when the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e. TPDU starts right after SMSC length octet. To send the message issue **Ctrl-Z** char (**0x1A** hex). To exit without sending the message issue **ESC** char (**0x1B** hex). If message is successfully sent to the network, then the result is sent in the format: Note : Optionally (when +CSMS **<service>** value is 1 and network supports) <ackpdu> is returned: **+CMGS: <mr>[,<ackpdu>]** where **<mr>** - message reference number. **<ackpdu>** - GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for **<pdu>** in case of SMS, but without GSM 04.11 SC address field and parameter shall be enclosed in double quote characters like a normal string type parameter. Note: if message sending fails for some reason, an error code is reported. Note: concatenated SMS is not supported

+CMGS - Send Message	
	Note: SIO consumes all SMS commands and also the text entered by user. So C-AT doesnot receive any SMS commands until SIO is fixed.
(Text Mode) **AT+CMGS=<da>[,<toda>]**	**(Text Mode)** Execution command sends to the network a message. Parameters: **<da>** - destination address, string type. **<toda>** - type of destination address 129 - number in national format 145 - number in international format (contains the "+") After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** After this prompt text can be entered; the entered text should be formatted as follows: - if **<dcs>** (set with +CSMP) indicates that 3GPP TS 23.038 [2] GSM 7 bit default alphabet is used and **<fo>** indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is not set: - if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007 [9]): ME/TA converts the entered text into the GSM 7 bit default alphabet according to rules of Annex A; backspace can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user); - if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into the GSM 7 bit default alphabet characters. (e.g. 17 (IRA 49 and 55) will be converted to character Π (GSM 7 bit default alphabet 23)). - if **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used or **<fo>** indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is set: the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. two characters 2A (IRA 50 and 65) will be converted to an octet with integer value 42). To send the message issue **Ctrl-Z** char (**0x1A** hex). To exit without sending the message issue **ESC** char (**0x1B** hex). If message is successfully sent to the network, then the result is sent in the format: Note : Optionally (when +CSMS **<service>** value is 1 and network supports) <scts> is returned:

+CMGS - Send Message	
	+CMGS: <mr>[,<scts>] where **<mr>** - message reference number. **<scts>** - TP-Service Centre Time Stamp in Time String Format. Note: if message sending fails for some reason, an error code is reported. Note: concatenated SMS is not supported Note: In text mode, the maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used, and 140 characters according to the 8 bit GSM coding scheme. Note: SIO consumes all SMS commands and also the text entered by user. So C-AT doesnot receive any SMS commands until SIO is fixed.
AT+CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	*Set PDU mode* AT+CMGF=0 AT+CMGS=18 > 088128010099010259115507811020905512F90000A704F4F29C0E +CMGS: 124 OK *Set text mode* AT+CMGF=1 AT+CSMP=17,167,0,0 AT+CMGS=”01090255219”,129 >TEST MESSAGE +CMGS:125 OK
Reference	3GPP TS 27.005

3.5.4.4.2. Send Message From Storage - +CMSS

+CMSS - Send Message From Storage	
AT+CMSS= <index>[,<da> [,<toda>]]	Execution command sends message with location value <index> from preferred message storage **<mem2>** to the network. Parameters: **<index>** - location value in the message storage **<mem2>** of the message to send **<da>** - destination address, string type . if it is given it shall be used instead of the one stored with the message. **<toda>** - type of destination address 129 - number in national format 145 - number in international format (contains the "+") If message is successfully sent to the network then the result is sent in the format: **(PDU Mode)** Note : Optionally (when +CSMS **<service>** value is 1 and network supports) <ackpdu> is returned: **+CMGS: <mr>[,<ackpdu>]** **(Text Mode)** Note : Optionally (when +CSMS **<service>** value is 1 and network supports) <scts> is returned **+CMSS: <mr>[, <scts>]** where: **<mr>** - message reference number. **<scts>** - TP-Service Centre Time Stamp in Time String Format. **<ackpdu>** - GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for **<pdu>** in case of SMS, but without GSM 04.11 SC address field and parameter shall be enclosed in double quote characters like a normal string type parameter. If message sending fails for some reason, an error code is reported: **+CMS ERROR:<err>** Note: to store a message in the **<mem2>** storage see command **+CMGW.** Note: Optional return values **<scts>**, **<ackpdu>** are not provided by platform.
AT+CMSS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	AT+CMGF=1 OK AT+CMGW="0165872928" > test message... +CMGW: 28 AT+CMSS=28

+CMSS - Send Message From Storage	
	+CMSS: 136 OK
Reference	3GPP TS 27.005

3.5.4.4.3. Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	
(PDU Mode) **AT+CMGW=** **<length>** **[,<stat>]**	**(PDU Mode)** Execution command writes in the **<mem2>** memory storage a new message. Parameter: **<length>** - length in bytes of the PDU to be written. 7..164 **<stat>** - message status. 0 - new message 1 - read message 2 - stored message not yet sent (default) 3 - stored message already sent The device responds to the command with the prompt '>' and waits for the specified number of bytes. To write the message issue **Ctrl-Z** char (**0x1A** hex). To exit without writing the message issue **ESC** char (**0x1B** hex). If message is successfully written in the memory, then the result is sent in the format: **+CMGW: <index>** where: **<index>** - message location index in the memory **<mem2>**. If message storing fails for some reason, an error code is reported. Note: care must be taken to ensure that during the command execution, no other SIM interacting commands are issued.
(Text Mode) **AT+CMGW[=<da>** **[,<toda>** **[,<stat>]]]**	**(Text Mode)** Execution command writes in the **<mem2>** memory storage a new message. Parameters: **<da>** - destination address, string type. **<toda>** - type of destination address. 129 - number in national format 145 - number in international format (contains the "+") **<stat>** - message status. "REC UNREAD" - new received message unread

+CMGW - Write Message To Memory	
	"REC READ" - received message read "STO UNSENT" - message stored not yet sent (default) "STO SENT" - message stored already sent After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** After this prompt text can be entered; the entered text should be formatted as follows: - if **<dcs>** (set with +CSMP) indicates that 3GPP TS 23.038 [2] GSM 7 bit default alphabet is used and **<fo>** indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is not set: - if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007 [9]): ME/TA converts the entered text into the GSM 7 bit default alphabet according to rules of Annex A; backspace can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user); - if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into the GSM 7 bit default alphabet characters. (e.g. 17 (IRA 49 and 55) will be converted to character Π (GSM 7 bit default alphabet 23)). - if **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used or **<fo>** indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is set: the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. two characters 2A (IRA 50 and 65) will be converted to an octet with integer value 42). To write the message issue **Ctrl-Z** char (**0x1A** hex). To exit without writing the message issue **ESC** char (**0x1B** hex). If message is successfully written in the memory, then the result is sent in the format: **+CMGW: <index>** where: **<index>** - message location index in the memory **<mem2>**. If message storing fails for some reason, an error code is reported.
AT+CMGW=?	Test command returns the **OK** result code.

+CMGW - Write Message To Memory	
Reference	3GPP TS 27.005
Example	AT+CMGF=0 *set PDU mode* OK AT+CMGW=18 > 0881280100990102591155078110209055 12F90000A704F4F29C0E +CMGW: 29 OK AT+CMGF=1 *set text mode* OK AT+CSMP=17,167,0,0 OK AT+CSCA=”821029190903”,145 OK AT+CMGW="0165872928" > test message... +CMGW: 28

3.5.4.4.4. Delete Message - +CMGD

+CMGD - Delete Message	
AT+CMGD= <index> [,<delflag>]	Execution command deletes message from preferred message storage **<mem1>** location **<index>**. Parameter: **<index>** - message index in the selected storage **<mem1>** **<delflag>** - an integer indicating multiple message deletion request. 0 (or omitted) - delete message specified in **<index>** 1 - delete all read messages from **<mem1>** storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched 2 - delete all read messages from **<mem1>** storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched 3 - delete all read messages from **<mem1>** storage, sent and unsent mobile originated messages, leaving unread messages untouched 4 - delete all messages from **<mem1>** storage. Note: if **<delflag>** is present and not set to 0 then **<index>** is ignored and ME shall follow the rules for **<delflag>** shown above.
AT+CMGD=?	Test command shows the valid memory locations and optionally the supported values of **<delflag>**. **+CMGD: (supported <index>s list)[,(supported <delflag>s list)]**

+CMGD - Delete Message	
Example	AT+CMGD=? +CMGD: (0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50),(0-4) OK AT+CMGD=11 *Delete message in 10th record* OK AT+CMGD=1,4 *Delete all messages* OK
Reference	3GPP TS 27.005

3.5.4.4.5. More Message to Send - +CMMS

+CMMS – More Message to Send	
AT+CMMS=[<n>]	Set command controls the continuity of SMS relay protocol link. Multiple messages can be sent much faster as link is kept open. Parameter: <n> 0 – Disable (factory default) 1 - keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), then ME shall close the link and TA switches <n> automatically back to 0. 2 - keep permanently enabled (ME closes only the link after each send sequence, <n> is not switched back to 0).
AT+CMMS?	Read command reports the current value of the parameter <n>.
AT+CMMS=?	Test command reports the supported value of <n> parameter.
Reference	3GPP TS 27.005

3.5.5. Custom AT Commands

3.5.5.1. General Configuration AT Commands

3.5.5.1.1. Change Audio Path - #CAP

#CAP - Change Audio Path	
AT#CAP=[<n>]	Set command switches the active audio path depending on parameter **<n>** Parameter: **<n>** - audio path 0 - audio path follows the **AXE** input (factory default): • if **AXE** is low, handsfree is enabled; • if **AXE** is high, internal path is enabled 1 - enables handsfree external mic/ear audio path 2 - enables internal mic/ear audio path Note: The audio path are mutually exclusive, enabling one disables the other. Note: when changing the audio path, the volume level is set at the previously stored value for that audio path (see **+CLVL**). Note: AT#CAP= command with missing audio path value, returns ERROR cause.
AT#CAP?	Read command reports the active audio path in the format: **#CAP: <n>**.
AT#CAP=?	Test command reports the supported values for the parameter **<n>**.

3.5.5.1.1. Open Audio Loop - #OAP

#OAP – Open Audio Loop	
AT#OAP= <mode>	Set command sets Open Audio Path. Parameter: 0 - disables Open Audio Path (default) 1 - enables Open Audio Path *Note: This parameter is not saved in NVM* *Note : This command used only for production. Do not use with Audio command*
AT#OAP?	Read command returns the current Open Audio Path, in the format: **#OAP: <mode>**
AT#OAP =?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.2. Select Ringer Sound - #SRS

#SRS - Select Ringer Sound	
AT#SRS= **[<n>,<tout>]**	Set command sets the ringer sound. Parameters: **<n>** - ringing tone 0 - current ringing tone 1..*max* - ringing tone number, where *max* can be read by issuing the Test command **AT#SRS=?**. **<tout>** - ringing tone playing time-out in seconds. 0 - ringer is stopped (if present) and current ringer sound is set. 1..60 - ringer sound playing for **<tout>** seconds and, if **<n> > 0,** ringer sound **<n>** is set as default ringer sound. Note: when the command is issued with **<n> > 0** and **<tout> > 0**, the **<n>** ringing tone is played for **<tout>** seconds and stored as default ringing tone. Note: if command is issued with **<n> > 0** and **<tout> = 0**, the playing of the ringing is stopped (if present) and **<n>** ringing tone is set as current. Note: if command is issued with **<n> = 0** and **<tout> > 0** then the current ringing tone is played. Note: if both **<n>** and **<tout>** are **0** then the default ringing tone is set as current and ringing is stopped. Note: If all parameters are omitted then the behaviour of Set command is the same as Read command
AT#SRS?	Read command reports current selected ringing and its status in the form: **#SRS: <n>,<status>** where: **<n>** - ringing tone number 1..*max* **<status>** - ringing status 0 - selected but not playing 1 - currently playing
AT#SRS=?	Test command reports the supported values for the parameters **<n>** and **<tout>**

3.5.5.1.3. Select Ringer Path - #SRP

#SRP - Select Ringer Path	
AT#SRP=[<n>]	Set command selects the ringer path towards whom sending ringer sounds and all signalling tones. Parameter: **<n>** - ringer path number 0 - sound output towards current selected audio path (see command **#CAP**)

#SRP - Select Ringer Path	
AT#SRP?	Read command reports the selected ringer path in the format: **#SRP: <n>**.
AT#SRP=?	Test command reports the supported values for the parameter **<n>**.
Example	AT#SRP=? #SRP: (0) OK AT#SRP=0 OK

3.5.5.1.4. Signalling Tones Mode - #STM

#STM - Signaling Tones Mode	
AT#STM= [<mode>]	Set command enables/disables the signalling tones output on the audio path selected with **#SRP** command Parameter: **<mode>** - signalling tones status 0 - signalling tones disabled 1 - signalling tones enabled 2 – all tones disabled Note: **AT#STM=0** has the same effect as **AT+CALM=2**; **AT#STM=1** has the same effect as AT+CALM=**0**.
AT#STM?	Read command reports whether the current signaling tones status is enabled or not, in the format: **#STM: <mode>**
AT#STM=?	Test command reports supported range of values for parameter **<mode>**.

3.5.5.1.5. Tone Playback - #TONE

#TONE - Tone Playback	
AT#TONE=<tone> [,<duration>]	Execution command allows the reproduction of DTMF tones, standard free tone, standard busy tone, and a set of user defined tones for a certain time. Parameters: **<tone>** - ASCII characters, range is ((0-9),#,*,(A-D),(G-L),Y,Z); - (0-9), #,*,(A-D): DTMF tone - (G-L): User Defined Tones - Y: free tone - Z: busy tone **<duration>** - playback duration in 1/10 sec. 1..300 - tenth of seconds (default is 30)
AT#TONE=?	Test command returns the supported range of values for parameters

#TONE - Tone Playback	
	<tone> and **<duration>**.

3.5.5.1.6. *Tone Classes Volume*

#TSVOL – Tone Classes Volume	
AT#TSVOL= <class>, <mode> [,<volume>]	Set command is used to select the volume mode for one or more tone classes. Parameters: **<class>** -sum of integers each representing a class of tones which the command refers to 1 - GSM tones 2 - ringer tones 4 - alarm tones 8 - signaling tones 16 - DTMF tones 32 - SIM Toolkit tones 64 - user defined tones 128 - reserved 255 - all classes **<mode>** - it indicates which volume is used for the classes of tones represented by **<class>** 0 - default volume is used 1 - the volume **<volume> is used**. **<volume>** - volume to be applied to the set of classes of tones represented by **<class>**; it is mandatory if **<mode>** is **1**. 0..*max* - the value of *max* can be read issuing the Test command **AT#TSVOL=?** Note: The class DTMF Tones (<class>=16) refers only to the volume for locally generated DTMF tones. It doesn't affect the level of the DTMF generated by the network as result of AT+VTS command
AT#TSVOL?	Read command returns for each class of tones the last setting of **<mode>** and, if **<mode>** is not **0**, of **<volume>** too, in the format: **# TSVOL: 1,<mode1>[,<volume1>]<CR><LF>** **…** **#TSVOL: 64,<mode64>[,<volume64>]** Note: no info is returned for class 128.
AT#TSVOL=?	Test command returns the supported range of values of parameters **<class>**, **<mode>** and **<volume>**.
Example	at#tsvol=84,1,5 OK at#tsvol? #TSVOL: 1,0 # TSVOL: 2,0 # TSVOL: 4,1,5 # TSVOL: 8,0 # TSVOL: 16,1,5 # TSVOL: 32,0 #TSVOL: 64,1,5

#TSVOL – Tone Classes Volume	
	OK
Note:	GSM Tones: DialToneId BusyToneId CongestionToneId RadioPathToneId CallWaitingToneId Ringer Tone: RingingToneMOId RingingToneMTId AutoRedialConnToneId Alarm Tones: AlarmToneId BatteryLowToneId SMSToneId MMSToneId PowerOnToneId PowerOffToneId NoUnitsLeftToneId Signaling Tones: classzeroToneId NetworkIndToneId NoServiceToneId SignallingErrToneId AutoRedialToneId ErrorToneId CallDroppedToneId DTMF Tones Local ADTMF SIM Toolkit Tones SIMTDialToneId SIMTBusyToneId SIMTCongestionToneId SIMTRadioPathToneId SIMTCallDroppedToneId SIMTErrorToneId SIMTCallWaitingToneId SIMTRingingToneMTId User Defined Tones: Tone defined with AT#UDTSET

3.5.5.1.7. Software Shut Down - #SHDN

#SHDN - Software Shutdown

#SHDN - Software Shutdown	
AT#SHDN	Execution command causes device detach from the network and shut down. Before definitive shut down an **OK** response is returned. Note: after the issuing of this command any previous activity is terminated and the device will not respond to any further command. Note: to turn it on again Hardware pin ON/OFF must be tied **low**. Note: to turn it off, USB_VBUS pin must be tied **low**. Note: The maximum time to completely shutdown the device is 25 seconds.
AT#SHDN=?	Test command returns the OK result code.

3.5.5.1.8. Query Temperature Overflow - #QTEMP

#QTEMP - Query Temperature Overflow	
AT#QTEMP=<mode>	Set command has currently no effect. The interpretation of parameter **<mode>** is currently not implemented: any value assigned to it will simply have no effect. Response format
AT#QTEMP?	Read command queries the device internal temperature sensor for over temperature and reports the result in the format: **#QTEMP: <temp>** where: **<temp>** - over temperature indicator 0 - the device temperature is in the working range 1 - the device temperature is out of the working range Note: typical *temperature working range* is (-10°C..+55°C); anyway you are strongly recommended to consult the "Hardware User Guide" to verify the real temperature working range of your module
#QTEMP=?	Test command reports supported range of values for parameter **<mode>**.
Note	The device should not be operated out of its working temperature range, elsewhere proper functioning of the device is not ensured.

3.5.5.1.9. Temperature Monitor - #TEMPMON

#TEMPMON - Temperature Monitor	
AT#TEMPMON=<mod>[,<urcmode>[,<action>[,<hyst_time>	Set command sets the behaviour of the module internal temperature monitor. Parameters: **<mod>** 0 - sets the command parameters.

[,<GPIO>]]]]	1 - triggers the measurement of the module internal temperature, reporting the result in the format: **#TEMPMEAS: <level>,<value>** where: **<level>** - threshold level -2 - extreme temperature lower bound (see Note) -1 - operating temperature lower bound (see Note) 0 - normal temperature 1 - operating temperature upper bound (see Note) 2 - extreme temperature upper bound (see Note) **<value>** actual temperature expressed in Celsius degrees **Setting of the following optional parameters has meaning only if <mod>=0:** **<urcmode>** - URC presentation mode. 0 - it disables the presentation of the temperature monitor URC 1 - it enables the presentation of the temperature monitor URC, whenever the module internal temperature reaches either operating or extreme levels; the unsolicited message is in the format: **#TEMPMEAS: <level>,<value>** where: **<level>** and **<value>** are as before **<action>** - sum of integers, each representing the action to be done whenever the module internal temperature reaches either operating or extreme levels (default is 0). If **<action>** is not zero, it is mandatory to set the **<hyst_time>** parameter too. 0 - no action (00) 1 - automatic shut-down when the temperature is beyond the extreme bounds (01) 2 - RF TX circuits automatically disabled (using **+CFUN=2**) when operating temperature bounds are reached. When the temperature is back to normal the module is brought back to the previous state, before RF TX disabled. (10) (Source Limitation) 4 - the output pin **<GPIO>** is tied HIGH when operating temperature bounds are reached; when the temperature is back to normal the output pin **<GPIO>** is tied LOW. If this **<action>** is required, it is mandatory to set the **<GPIO>** parameter too. (100) Note: Possible values for the parameter **<action>** are form 0 to 7 (000, 001,

	010, 011, 100, 101, 110 and 111) **<hyst_time>** - hysteresis time: all the actions happen only if the extreme or operating bounds are maintained at least for this period. This parameter is needed and required if **<action>** is not zero. 0..255 - time in seconds Note: **<action>** can assume values from 1-7 **<GPIO>** - GPIO number. Valid range is "any output pin" (see "Hardware User's Guide"). This parameter is needed and required only if **<action>=4** is enabled. Note: **if the <GPIO> is specified <action> shall** assume values from 4-7. Note: last **<urcmode>** settings are saved as extended profile parameters. Note: last **<action>**, **<hyst_time>** and **<GPIO>** settings are global parameters saved in NVM
AT#TEMPMON?	Read command reports the current parameter settings for **#TEMPMON** command in the format: **#TEMPMON: <urcmode>,<action>[,<hyst_time>[,<GPIO>]]**
AT#TEMPMON=?	Test command reports the supported range of values for parameters **<mod>**, **<urcmode>**, **<action>**, **<hyst_time>** and **<GPIO>**
Note	In the following table typical temperature bounds are represented; anyway you are strongly recommended to consult the "Hardware User Guide" to verify the real temperature bounds for your module. Extreme Temperature Lower Bound(*) — T_{ext_low} Operating Temperature Lower Bound(*) — T_{op_low} Operating Temperature Operating Temperature Upper Bound(*) — T_{op_up} Extreme Temperature Upper Bound(*) — T_{ext_up} (*) Due to temperature measurement uncertainty there is a tolerance of +/-2°C

3.5.5.1.10. General Purpose Input/Output Pin Control - #GPIO

#GPIO - General Purpose Input/Output Pin Control	
AT#GPIO=<pin>, <mode>[,<dir>]	**AT#GPIO** =<pin>,<mode>[,<dir>] Execution command sets the value of the general purpose output pin GPIO<pin> according to <dir> and <mode> parameter. Parameters: **<pin>** - GPIO pin number; supported range is from 1 to a value that depends on the hardware. **<mode>** - its meaning depends on <dir> setting: 0 - no meaning if <dir>=0 - INPUT - output pin cleared to 0 (Low) if <dir>=1 - OUTPUT 1 - no meaning if <dir>=0 - INPUT - output pin set to 1 (High) if <dir>=1 - OUTPUT 2 - Reports the read value from the input pin if <dir>=0 - INPUT - Reports the read value from the input pin if <dir>=1 - OUTPUT **<dir>** - GPIO pin direction 0 - pin direction is INPUT 1 - pin direction is OUTPUT 2 - pin direction is ALTERNATE FUNCTION (see Note) Note: when **<mode>=2** (and **<dir>** is omitted) the command reports the direction and value of pin **GPIO<pin>** in the format: **#GPIO: <dir>,<stat>** where: **<dir>** - current direction setting for the **GPIO<pin>** **<stat>** • logic value read from pin **GPIO<pin>** in the case the pin **<dir>** is set to input; • logic value present in output of the pin **GPIO<pin>** in the case the pin **<dir>** is currently set to output; • no meaning value for the pin **GPIO<pin>** in the case the pin **<dir>** is set to alternate function. Note: "ALTERNATE FUNCTION" value is valid only for following pins: • **GPIO6** - alternate function is “ALARM Output” (see +CALA) • **GPIO10** - alterantive function is “DVI TX” (See #DVI) • **GPIO17** - alternative function is “DVI SYNC” (See #DVI) • **GPIO18** - alternative function is “DVI RX” (See #DVI)
AT#GPIO?	Read command reports the read direction and value of all **GPIO** pins, in the format: **#GPIO: <dir>,<stat>[<CR><LF>#GPIO: <dir>,<stat>[…]]** where: **<dir>** - as seen before **<stat>** - as seen before
AT#GPIO=?	Test command reports the supported range of values of the command parameters

#GPIO - General Purpose Input/Output Pin Control	
	<pin>, **<mode>** and **<dir>**.
Example	

3.5.5.1.11. STAT_LED GPIO Setting - #SLED

#SLED - STAT_LED GPIO Setting	
AT#SLED=<mode> **[,<on_duration>** **[,<off_duration>]]**	Set command sets the behaviour of the **STAT_LED** GPIO Parameters: **<mode>** - defines how the **STAT_LED** GPIO is handled 0 - GPIO tied **Low** 1 - GPIO tied **High** 2 - GPIO handled by Module Software (factory default) 3 - GPIO is turned on and off alternatively, with period defined by the sum **<on_duration>** + **<off_duration>** <**on_duration**> - duration of period in which **STAT_LED** GPIO is tied **High** while **<mode>=3** 1..100 - in tenth of seconds (default is 10) <**off_duration**> - duration of period in which **STAT_LED** GPIO is tied **Low** while **<mode>=3** 1..100 - in tenth of seconds (default is 10) Note: values are saved in NVM by command **#SLEDSAV** Note: at module boot the **STAT_LED** GPIO is always tied **High** and holds this value until the first NVM reading.
AT#SLED?	Read command returns the **STAT_LED** GPIO current setting, in t he format: **#SLED: <mode>,<on_duration>,<off_duration>**
AT#SLED=?	Test command returns the range of available values for parameters **<mode>**, **<on_duration>** and **<off_duration>**.

3.5.5.1.12. Save STAT_LED GPIO Setting - #SLEDSAV

#SLEDSAV - Save STAT_LED GPIO Setting	
AT#SLEDSAV	Execution command saves **STAT_LED** setting in NVM.
AT#SLEDSAV=?	Test command returns **OK** result code.

3.5.5.1.13. Cell Monitor - #MONI

#MONI - Cell Monitor	
AT#MONI= **<number>**	Set command sets one cell out of seven, in a neighbour of the serving cell including it, from which extract GSM/WCDMA-related information. Parameter: **<number>**

#MONI - Cell Monitor	
	<GSM network> 0..6 - it is the ordinal number of the cell, in a neighbour of the serving cell. 7 - it is a special request to obtain GSM-related information from the whole set of seven cells in the neighbour of the serving cell. <WCDMA network> 0 – it is the active set 1 – it is the candidate set 2 – it is the syncronized neighbour set 3 – it is the asyncronized neighbour set 4..7 – it is not available <GSM network> a) When extracting data for the serving cell and the network name is known the format is: **(GSM network)** **#MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>** **(WCDMA network)** **#MONI: <netmame> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>** b) When the network name is unknown, the format is: **(GSM network)** **#MONI: Cc:<cc> Nc:<nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>** **(WCDMA network)** **#MONI: Cc:<cc> Nc:<nc> PSC:<psc> RSCP:<rscp> LAC:,<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>** c) When extracting data for an adjacent cell, the format is: **(GSM network)** **#MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm> dBm** **(WCDMA network)** **#MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr>** where: **<netname>** - name of network operator **<cc>** - country code **<nc>** - network operator code **<n>** - progressive number of adjacent cell **<bsic>** - base station identification code **<qual>** - quality of reception

#MONI - Cell Monitor	
	0..7 **<lac>** - localization area code **<id>** - cell identifier (hexadecimal character format) **<arfcn>** - assigned radio channel **<dBm>** - received signal strength in dBm **<timadv>** - timing advance **<psc>** - primary synchronisation code **<rscp>** - Received Signal Code Power in dBm **<ecio>** - chip energy per total wideband power in dBm **<uarfcn>** - UMTS assigned radio channel **<drx>** - Discontinuous reception cycle length **<scr>** - Scrambling code Note: TA: **<timadv>** is reported only for the serving cell.
AT#MONI=?	Test command reports the maximum number of cells, in a neighbour of the serving cell excluding it, from which we can extract GSM/WCDMA-related information, along with the ordinal number of the current selected cell, in the format: **#MONI: (<MaxCellNo>,<CellSet>)** where: **<MaxCellNo>** - maximum number of cells, in a neighbour of the serving cell and excluding it, from which we can extract GSM-related information. This value is always **6**. **<CellSet>** - the last setting done with command **#MONI**.
Note	The refresh time of the measures is preset to 3 sec. The timing advance value is meaningful only during calls or GPRS transfers active.

3.5.5.1.14. Read Current Network Status - #RFSTS

#RFSTS – Read current network Status

AT#RFSTS

Read current status in the format

(GSM network)
#RFSTS:
<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,<RR>,<NOM>, <CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>[CR,LF] [CR,LF]

Parameter	GSM Example	description
PLMN	"450 05"	Country code and operator code(MCC, MNC)
ARFCN	114	GSM Assigned Radio Channel
RSSI	-67	Received Signal Strength Indication
LAC	2011	Localization Area Code
RAC	11	Routing Area Code
TXPWR	1	Tx Power
MM	19	Mobility Management
RR	0	Radio Resource
NOM	1	Network Operator Mode

#RFSTS – Read current network Status

CID	2825220	Cell ID (Hexadecimal character format).
IMSI	"450050203619261"	International Mobile Station ID
NetNameAsc	"SKTelecom"	Operation Name, Quoted string type
SD	3	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 : CS+PS)
ABND	2	Active Band (1 : GSM 850, 2 : GSM 900, 3 : DCS 1800, 4 : PCS 1900)

(WCDMA network)
#RFSTS:
<PLMN>,<UARFCN>,<PSC>,<Ec/Io>,<RSCP>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<DRX>,<MM>,<RRC>,<NOM>,<BLER>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<nAST>[,<nUARFCN><nPSC>,<nEc/Io>,,,,][CR,LF] [CR,LF]

Parameter	WCDMA Example	description
PLMN	"450 05"	Country code and operator code(MCC, MNC)
UARFCN	10737	UMTS Assigned Radio Channel
PSC	75	Active PSC(Primary Synchronization Code)
Ec/Io	-7.0	Active Ec/Io(chip energy per total wideband power in dBm)
RSCP	-74	Active RSCP (Received Signal Code Power in dBm)
RSSI	-67	Received Signal Strength Indication
LAC	2011	Localization Area Code
RAC	11	Routing Area Code
TXPWR	1	Tx Power
DRX	64	Discontinuous reception cycle Length(cycle length : display using ms)
MM	19	Mobility Management
RRC	0	Radio Resource Control
NOM	1	Network Operator Mode
BLER	005	Block Error Rate(005 means 0.5 %)
CID	2825220	Cell ID (Decimal character format).
IMSI	"450050203619261"	International Mobile Station ID
NetNameAsc	"SKTelecom"	Operation Name, Quoted string type
SD	3	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 : CS+PS)
nAST	3	Number of Active Set(Maximum 6)
nUARFCN		UARFCN of n th active set
nPSC		PSC of n th active set
nEc/Io		Ec/Io of n th active Set

#RFSTS – Read current network Status	
	Note 1 : nAST : Number of active set. Maximum is 6 Note 2 : If <nAST> is 1, it means that number of active set is 1. In this case, the module does not display parameters <nUARFCN>,<nPSC> and <nEc/Io>.

3.5.5.1.15. Serving Cell Information - #SERVINFO

#SERVINFO - Serving Cell Information	
AT#SERVINFO	Execution command reports information about serving cell, in the format: **(GSM network)** **#SERVINFO: <B-ARFCN>,<dBM>,<NetNameAsc>,<NetCode>, ,<BSIC>,<LAC>,<TA>,<GPRS>[,[<PB-ARFCN>],[<NOM>], <RAC>,[PAT]]** where: **<B-ARFCN>** - BCCH ARFCN of the serving cell **<dBM>** - received signal strength in dBm **<NetNameAsc>** - operator name, quoted string type **<NetCode>** - country code and operator code, hexadecimal representation **<BSIC>** - Base Station Identification Code **<LAC>** - Localization Area Code **<TA>** - Time Advance: it's available only if a GSM or GPRS is running **<GPRS>** - GPRS supported in the cell 0 - not supported 1 - supported The following information will be present only if GPRS is supported in the cell **<PB-ARFCN>** - PBCCH ARFCN of the serving cell; it'll be printed only if PBCCH is supported by the cell, otherwise the label **"hopping"** will be printed **<NOM>** - Network Operation Mode .."I" "II" .."III" **<RAC>** - Routing Area Color Code **<PAT>** - Priority Access Threshold ..0 ..3..6 **(WCDMA network)** **#SERVINFO: <UARFCN>, <dBM>, <NetNameAsc>,<NetCode>, <PSC>,<LAC>,<DRX>,<SD>,<RSCP>, <NOM>,<RAC>** where: **<UARFCN>** - UMTS ARFCN of the serving cell

#SERVINFO - Serving Cell Information	
	<dBM> - received signal strength in dBm **<NetNameAsc>** - operator name, quoted string type **<NetCode>** - country code and operator code, hexadecimal representation **<PSC>** - Primary Synchronisation Code **<LAC>** - Localization Area Code **<DRX>** - Discontinuous reception cycle length **<SD>** - Service Domain 0 – No Service 1 – CS Only 2 – PS Only 3 – CS & PS **<RSCP>** - Received Signal Code Power in dBm **<NOM>** - Network Operation Mode ..”I” “II” ..”III” **<RAC>** - Routing Area Color Code Note 1: In HE seriese, value of <PB-ARFCN> is displayed as blank.

3.5.5.1.16. Read Analog/Digital Converter Input - #ADC

#ADC - Read Analog/Digital Converter Input	
AT#ADC=<adc>,<mode>[,<dir>]	Execution command reads pin**<adc>** voltage, converted by ADC, and outputs it in the format: **#ADC: <value>** where: **<value>** - pin**<adc>** voltage, expressed in mV Parameters: **<adc>** - index of pin 1 - available 2 - available 3 - available **<mode>** - required action 2 - query ADC value **<dir>** - direction; its interpretation is currently not implemented 0 - no effect. Note: The command returns the last valid measure.
AT#ADC?	Read command reports all pins voltage, converted by ADC, in the format: **#ADC: <value>[<CR><LF>#ADC: <value>[…]]**
AT#ADC=?	Test command reports the supported range of values of the command parameters **<adc>**, **<mode>** and **<dir>**.

3.5.5.1.17. Digital/Analog Converter Control - #DAC

#DAC - Digital/Analog Converter Control	
AT#DAC= <enable> [,<value>]	Set command enables/disables the **DAC_OUT** pin. Parameters: **<enable>** - enables/disables DAC output. 0 - disables pin; it is in high impedance status (factory default) 1 - enables pin; the corresponding output is driven **<value>** - scale factor of the integrated output voltage; it must be present if **<enable>=1** 0..1023 - 10 bit precision Note: **integrated output voltage = MAX_VOLTAGE * value / 1023**
AT#DAC?	Read command reports whether the **DAC_OUT** pin is currently enabled or not, along with the integrated output voltage scale factor, in the format: **#DAC: <enable>,<value>**
AT#DAC=?	Test command reports the range for the parameters **<enable>** and **<value>**.
Example	*Enable the DAC out and set its integrated output to the 50% of the max value:* AT#DAC=1,511 OK *Disable the DAC out:* AT#DAC=0 OK
Note	With this command the DAC frequency is selected internally. D/A converter must not be used during POWERSAVING. **DAC_OUT** line must be integrated (for example with a low band pass filter) in order to obtain an analog voltage. For a more in depth description of the integration filter refer to the hardware user guide.

3.5.5.1.18. Auxiliary Voltage Output Control - #VAUX

#VAUX- Auxiliary Voltage Output Control	
AT#VAUX= [<n>,<stat>]	Set command enables/disables the Auxiliary Voltage pins output. Parameters: **<n>** - **VAUX** pin index 1 - there is currently just one **VAUX** pin **<stat>** 0 - output off 1 - output on 2 - query current value of **VAUX** pin

#VAUX- Auxiliary Voltage Output Control	
	Note: when **<stat>=2** and command is successful, it returns: **#VAUX: <value>** where: **<value>** - power output status 0 - output off 1 - output on(factory default) Note: the current setting is stored through **#VAUXSAV**
AT#VAUX?	Read command reports whether the Auxiliary Voltage pin output is currently enabled or not, in the format: **#VAUX: <value>**
AT#VAUX=?	Test command reports the supported range of values for parameters **<n>**, **<stat>**.

3.5.5.1.19. Auxiliary Voltage Output Save - #VAUXSAV

#VAUXSAV - Auxiliary Voltage Output Save	
AT#VAUXSAV	Execution command saves the actual state of **#VAUX** pin to NVM. The state will be reload at power-up.
AT#VAUXSAV=?	Test command returns the **OK** result code.

3.5.5.1.20. AXE Pin Reading - #AXE

#AXE - AXE Pin Reading	
AT#AXE	Execution command causes the ME to return the current state of **AXE** pin in the format: **#AXE: <state>** where: **<state>** 0 - **Low** 1 - **High**
AT#AXE=?	Test command returns the **OK** result code.

3.5.5.1.21. Battery And Charger Status - #CBC

#CBC- Battery And Charger Status	
AT#CBC	Execution command returns the current Battery and Charger state in the format: **#CBC: <ChargerState>,<BatteryVoltage>** where:

#CBC- Battery And Charger Status	
	<ChargerState> - battery charger state 0 - charger not connected **<BatteryVoltage>** - battery voltage in millivolt: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage.
AT#CBC=?	Test command returns the **OK** result code.

3.5.5.1.22. Audio Codec - #CODEC

#CODEC - Audio Codec	
AT#CODEC=[<codec>]	Set command sets the audio codec mode. Parameter: **<codec>** 0 - all the codec modes are enabled (factory default) 1..31 - sum of integers each representing a specific codec mode: 1 - **FR**, full rate mode enabled 2 - **EFR**, enhanced full rate mode enabled 4 - **HR**, half rate mode enabled 8 - **AMR-FR**, AMR full rate mode enabled 16 - **AMR-HR**, AMR half rate mode enabled 32 - **AMR-WB**, AMR wideband mode enabled Note: the setting 0 is equivalent to the setting 63.
AT#CODEC?	Read command returns current audio codec mode in the format: **#CODEC: <codec>**
AT#CODEC=?	Test command returns the range of available values for parameter **<codec>**
Example	AT#CODEC=14 OK *sets the codec modes HR (4), EFR (2) and AMR-FR (8)*

3.5.5.1.23. Handsfree Echo Canceller - #SHFEC

#SHFEC - Handsfree Echo Canceller	
AT#SHFEC=[<mode>]	Set command enables/disables the echo canceller function on audio handsfree output. Parameter: **<mode>** 0 - disables echo canceller for handsfree mode (factory default) 1 - enables echo canceller for handsfree mode

#SHFEC - Handsfree Echo Canceller	
	Note: This setting returns to default after power off.
AT#SHFEC?	Read command reports whether the echo canceller function on audio handsfree output is currently enabled or not, in the format: **#SHFEC: <mode>**
AT#SHFEC=?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.24. Handsfree Microphone Gain - #HFMICG

#HFMICG - Handsfree Microphone Gain	
AT#HFMICG=[<level>]	Set command sets the handsfree microphone input gain Parameter: **<level>**: handsfree microphone input gain 0..7 - handsfree microphone gain (+6dB/step, factory default=4)
AT#HFMICG?	Read command returns the current handsfree microphone input gain, in the format: **#HFMICG: <level>**
AT#HFMICG=?	Test command returns the supported range of values of parameter **<level>**.

3.5.5.1.25. Handset Microphone Gain - #HSMICG

#HSMICG - Handset Microphone Gain	
AT#HSMICG=[<level>]	Set command sets the handset microphone input gain Parameter: **<level>**: handset microphone input gain 0..7 - handset microphone gain (+6dB/step, factory default=0)
AT#HSMICG?	Read command returns the current handset microphone input gain, in the format: **#HSMICG: <level>**
AT#HSMICG=?	Test command returns the supported range of values of parameter **<level>**.

3.5.5.1.26. Set Headset Sidetone - #SHFSD

#SHFSD - Set Headset Sidetone	
AT#SHFSD=[<mode>]	Set command enables/disables the sidetone on headset audio output. Parameter: **<mode>** 0 - disables the headset sidetone (factory default) 1 - enables the headset sidetone.

#SHFSD - Set Headset Sidetone	
	Note: This setting returns to default after power off.
AT#SHFSD?	Read command reports whether the headset sidetone is currently enabled or not, in the format: **#SHFSD: <mode>**
AT#SHFSD=?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.27. Speaker Mute Control - #SPKMUT

#SPKMUT - Speaker Mute Control	
AT#SPKMUT=<n>	Set command enables/disables the global muting of the speaker audio line, for every audio output (ring, incoming sms, voice, Network coverage) Parameter: **<n>** 0 - mute off, speaker active (factory default) 1 - mute on, speaker muted. Note: this command mutes/activates both speaker audio paths, internal speaker and external speaker.
AT#SPKMUT?	Read command reports whether the muting of the speaker audio line during a voice call is enabled or not, in the format: **#SPKMUT: <n>**
AT#SPKMUT=?	Test command reports the supported values for **<n>** parameter.

3.5.5.1.28. Handsfree Receiver Gain - #HFRECG

#HFRECG - Handsfree Receiver Gain	
AT#HFRECG=<level>	Set command sets the handsfree analogue output gain Parameter: **<level>**: handsfree analogue output gain 0..6 - handsfree analogue output (-3dB/step, factory default=0) *Note: This parameter is saved in NVM issuing AT&W command.*
AT#HFRECG?	Read command returns the current handsfree analog output gain, in the format: **#HFRECG: <level>**
AT#HFRECG =?	Test command returns the supported range of values of parameter **<level>**.

3.5.5.1.29. Handset Receiver Gain - #HSRECG

#HSRECG - Handset Receiver Gain	
AT#HSRECG=	Set command sets the handset analogue output gain

<level>	Parameter: **<level>**: handset analogue output gain 0..6 - handset analogue output (-3dB/step, factory default=0) *Note: This parameter is saved in NVM issuing AT&W command.*
AT#HSRECG?	Read command returns the current handset analog output gain, in the format: **#HSRECG: <level>**
AT#HSRECG =?	Test command returns the supported range of values of parameter **<level>**.

3.5.5.1.30. Audio Profile Factory Configuration - #PRST

#PRST - Audio Profile Factory Configuration	
AT#PRST	Execution command resets the actual audio parameters in the NVM of the device to the default set. The audio parameters to reset are: - microphone line gain - earpiece line gain - side tone gain - LMS adaptation speed (step size) - LMS filter length (number of coefficients) - speaker to micro signal power relation - noise reduction max attenuation - noise reduction weighting factor (band 300-500Hz) - noise reduction weighting factor (band 500-4000Hz) - AGC Additional attenuation - AGC minimal attenuation - AGC maximal attenuation
AT#PRST=?	Test command returns the **OK** result code.
Example	AT#PRST OK *Current audio profile is reset*

3.5.5.1.31. Audio Profile Configuration Save - #PSAV

#PSAV - Audio Profile Configuration Save	
AT#PSAV	Execution command saves the actual audio parameters in the NVM of the device. The audio parameters to store are: - microphone line gain - earpiece line gain - side tone gain - LMS adaptation speed - LMS filter length (number of coefficients)

#PSAV - Audio Profile Configuration Save	
	- speaker to micro signal power relation - noise reduction max attenuation - noise reduction weighting factor (band 300-500Hz) - noise reduction weighting factor (band 500-4000Hz) - AGC Additional attenuation - AGC minimal attenuation - AGC maximal attenuation
AT#PSAV=?	Test command returns the **OK** result code.
Example	AT#PSAV OK *Current audio profile is saved in NVM*

3.5.5.1.32. Audio Profile Selection - #PSEL

#PSEL - Audio Profile Selection	
AT#PSEL=<prof>	Set command selects the active audio profile Parameter: **<prof>**: current profile 0 - standard profile 1..3 - extended profile, modifiable. *Note: This parameter is saved in NVM issuing AT&W command.*
AT#PSEL?	The read command returns the active profile in the format: **#PSEL:<prof>**
AT#PSEL=?	Test command returns the supported range of values of parameter **<prof>**.

3.5.5.1.33. Audio Profile Setting - #PSET

#PSET - Audio Profile Setting	
AT#PSET= **<scal _in>** **[,<scal _out>** **[,<side_tone_atten>** **[,<adaption_speed>** **[,<filter_length>** **[,<rxtxrelation>** **[,<nr_atten>** **[,<nr_w_0>** **[,<nr_w_1>** **[,<add_atten>** **[,<min_atten>** **[,<max_atten>** **]]]]]]]]]]]]]]]**	Set command sets parameters for the active audio profile. Parameters: **<scal_in>** - microphone line digital gain **<scal_out>** - earpiece line digital gain **<side_tone_atten>** - side tone attenuation **<adaption_speed>** - LMS adaptation speed **(TBD)** **<filter_length>** - LMS filter length (number of coefficients) **<rxtxrelation>** - speaker to micro signal power relation **(TBD)** **<nr_ atten >** - noise reduction max attenuation **(TBD)** **<nr_w_0>** - noise reduction weighting factor (band 300-500Hz) **(TBD)** **<nr_w_1>** - noise reduction weighting factor (band 500-4000Hz) **(TBD))** **<add_atten>** - AGC Additional attenuation**(TBD)** **<min_atten>** - AGC minimal attenuation**(TBD))**

#PSET - Audio Profile Setting	
	<max_atten> - AGC maximal attenuation**(TBD)**
AT#PSET?	Read command returns the parameters for the active profile in the format: **#PSET:<scal_in>,<scal_out>,<side_tone_atten>,<adaption_speed>,<filter_length>,<rxtxrelation>,<nr_atten>,<nr_w_0>,<nr_w_1>,<add_atten>,<min_atten>,<max_atten>** It is not allowed if active audio profile is 0.
AT#PSET=?	Test command returns the supported range of values for the audio parameters.

3.5.5.1.34. Handsfree Automatic Gain Control - #SHFAGC

#SHFAGC - Handsfree Automatic Gain Control	
AT# SHFAGC = <mode>	Set command enables/disables the automatic gain control function on audio handsfree input. Parameter: **<mode>** 0 - disables automatic gain control for handsfree mode (default) 1 - enables automatic gain control for handsfree mode *Note: This parameter is saved in NVM issuing AT&W command.*
AT# SHFAGC?	Read command reports whether the automatic gain control function on audio handsfree input is currently enabled or not, in the format: **#SHFAGC: <mode>**
AT# SHFAGC =?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.35. Handsfree Noise Reduction - #SHFNR

# SHFNR - Handsfree Noise Reduction	
AT#SHFNR = <mode>	Set command enables/disables the noise reduction function on audio handsfree input. Parameter: **<mode>** 0 - disables noise reduction for handsfree mode (default) 1 - enables noise reduction for handsfree mode *Note: This parameter is saved in NVM issuing AT&W command.*
AT#SHFNR?	Read command reports whether the noise reduction function on audio handsfree input is currently enabled or not, in the format: **#SHFNR: <mode>**
AT#SHFNR =?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.36. Handset Automatic Gain Control - #SHSAGC

#SHSAGC - Handset Automatic Gain Control	
AT#SHSAGC = <mode>	Set command enables/disables the automatic gain control function on audio handset input. Parameter: **<mode>** 0 - disables automatic gain control for handset mode (default) 1 - enables automatic gain control for handset mode *Note: This parameter is saved in NVM issuing AT&W command.*
AT#SHSAGC?	Read command reports whether the automatic gain control function on audio handset input is currently enabled or not, in the format: **#SHSAGC: <mode>**
AT#SHSAGC =?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.37. Handset Echo Canceller - #SHSEC

#SHSEC - Handset Echo Canceller	
AT#SHSEC = <mode>	Set command enables/disables the echo canceller function on audio handset output. Parameter: **<mode>** 0 - disables echo canceller for handset mode (default) 1 - enables echo canceller for handset mode *Note: This parameter is saved in NVM issuing AT&W command.*
AT#SHSEC?	Read command reports whether the echo canceller function on audio handset output is currently enabled or not, in the format: **#SHSEC: <mode>**
AT#SHSEC =?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.38. Handset Noise Reduction - #SHSNR

#SHSNR - Handset Noise Reduction	
AT# SHSNR = <mode>	Set command enables/disables the noise reduction function on audio handset input. Parameter: **<mode>** 0 - disables noise reduction for handset mode (default) 1 - enables noise reduction for handset mode

#SHSNR - Handset Noise Reduction	
	Note: This parameter is saved in NVM issuing AT&W command.
AT# SHSNR?	Read command reports whether the noise reduction function on audio handset input is currently enabled or not, in the format: **#SHSNR: <mode>**
AT# SHSNR =?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.39. Set Handset Sidetone - #SHSSD

#SHSSD - Set Handset Sidetone	
AT#SHSSD= <mode>	Set command enables/disables the sidetone on handset audio output. Parameter: **<mode>** 0 - disables the handset sidetone 1 - enables the handset sidetone (factory default) *Note: This parameter is saved in NVM issuing AT&W command.*
AT#SHSSD?	Read command reports whether the headset sidetone is currently enabled or not, in the format: **#SHSSD: <mode>**
AT#SHSSD=?	Test command returns the supported range of values of parameter **<mode>**.

3.5.5.1.40. Network Timezone - #NITZ

#NITZ - Network Timezone	
AT#NITZ= [<val> [,<mode>]]	Set command enables/disables (a) automatic date/time updating, (b) Full Network Name applying and (c) **#NITZ** URC; moreover it permits to change the **#NITZ** URC format. Date and time information can be sent by the network after GSM registration or after GPRS attach. Parameters: **<val>** 0 - disables (a) automatic data/time updating, (b) Full Network Name applying and (c) **#NITZ** URC; moreover it sets the **#NITZ** URC *'basic'* format (see **<datetime>** below) (factory default) 1..15 - as a sum of: 1 - enables automatic date/time updating 2 - enables Full Network Name applying 4 - it sets the **#NITZ** URC *'extended'* format (see **<datetime>** below) 8 – it sets the #NITZ URC 'extended' format with Daylight Saving Time (DST) support (see <datetime> below).

#NITZ - Network Timezone	
	<mode> 0 - disables **#NITZ** URC (factory default) 1 - enables **#NITZ** URC; after date and time updating the following unsolicited indication is sent: **#NITZ: <datetime>** where: **<datetime>** - string whose format depends on subparameter **<val>** **"yy/MM/dd,hh:mm:ss"** - *'basic'* format, if **<val>** is in (0..3) **"yy/MM/dd,hh:mm:ss±zz"** - *'extended'* format, if **<val>** is in (4..7) "yy**"yy/MM/dd,hh:mm:ss±zz,d"** - *'extended'* format with DST support, if **<val>** is in (8..15) where: **yy** - year **MM** - month (in digits) **dd** - day **hh** - hour **mm** - minute **ss** - second **zz** - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory, range is -47..+48) **d** – number of hours added to the local TZ because of Daylight Saving Time (summertime) adjustment; range is 0-2. Note: If the DST information isn't sent by the network, then the **<datetime>** parameter has the format **"yy/MM/dd,hh:mm:ss±zz"**
AT#NITZ?	Read command reports whether (a) automatic date/time updating, (b) Full Network Name applying, (c) **#NITZ** URC (as well as its format) are currently enabled or not, in the format: **#NITZ: <val>,<mode>**
AT#NITZ=?	Test command returns supported values of parameters **<val>** and **<mode>**.

3.5.5.1.41. Select Band - #BND

#BND - Select Band	
AT#BND= **<GSM band>,** **<WCDMA band>**	Set command selects the current band. This command allows switching from automatic band selection to selection of combined bands. Parameter **<GSM band>**: 0 - GSM 900MHz + DCS 1800MHz

#BND - Select Band	
	1 - GSM 900MHz + PCS 1900MHz 2 - GSM 850MHz + DCS 1800MHz 3 - GSM 850MHz + PCS 1900MHz 4 - GSM 900MHz + DCS 1800MHz + PCS 1900MHz 5 - GSM 850MHz + DCS 1800MHz + GSM 900MHz + PCS 1900MHz **<WCDMA band>**: 0 - 2100MHz(FDD I) 1 - 1900MHz(FDD II) 2 - 850MHz(FDD V) 3 - 2100MHz(FDD I) + 1900MHz(FDD II) + 850MHz(FDD V) 4 - 1900MHz(FDD II) + 850MHz(FDD V) 5 - 900MHz(FDD VIII) 6 - 2100MHz(FDD I) + 900MHz(FDD VIII) 7 - 1700MHz(FDD IV) 8 - 2100MHz(FDD I) + 850MHz(FDD V) Note: if automatic band selection is enabled(AT#AUTOBND=2) then read command AT#BND? will report followed setting of band configuration. Band configuration for HE863 family is as followed HE863-NAx(GSM QUAD, FDD II / V) HE863-EUx(GSM QUAD, FDD I / VIII) HE863-AUx(GSM QUAD, FDD I / V)
AT#BND?	Read command returns the current selected band in the format: **#BND: <GSM band>, <WCDMA band>**
AT#BND=?	Test command returns the supported range of values of parameters **<GSM band>** and **<WCDMA band>**. Note: the range of values differs between modules

3.5.5.1.42. Automatic Band Selection - #AUTOBND

#AUTOBND - Automatic Band Selection	
AT#AUTOBND=[<value>]	Set command enables/disables the automatic band selection at power-on. Parameter: **<value>**: 0 - disables automatic band selection at ***next*** power-up (factory default) 1 - enables automatic band selection at ***next*** power-up 2 - enables automatic band selection in four bands (at 850/1900/900/1800) differently from previous settings it takes ***immediate*** effect

#AUTOBND - Automatic Band Selection	
	Note : Band selection will be followed #BND setting at next power-up when **AT#AUTOBND=0** or **AT#AUTOBND=1** is issued.
AT#AUTOBND?	Read command returns whether the automatic band selection is enabled or not in the form: **#AUTOBND: <value>**
AT#AUTOBND=?	Test command returns the range of supported values for parameter **<value>**.

3.5.5.1.43. RTC Status - #RTCSTAT

#RTCSTAT - RTC Status	
AT#RTCSTAT=<status>	Set command resets the RTC status flag. Parameter: **<status>** 0 - Set RTC Status to **RTC HW OK** Note: the initial value of RTC status flag is **RTC HW Error** and it doesn't change until a command **AT#RTCSTAT=0** is issued. Note: if a power failure occurs and the buffer battery is down the RTC status flag is set to **1**. It doesn't change until command **AT#RTCSTAT=0** is issued.
AT#RTCSTAT?	Read command reports the current value of RTC status flag, in the format: **#RTCSTAT: <status>**
AT#RTCSTAT=?	Test command returns the range of supported values for parameter **<status>**

3.5.5.1.44. GSM Antenna Detection - #GSMAD

#GSMAD - GSM Antenna Detection	
AT#GSMAD=<mod>,[<urcmode>[,<interval>[,<detGPIO>[,<repGPIO>]]]]	Set command sets the behaviour of antenna detection algorithm Parameters: **<mod>** 0 - detection algorithm not active 1 - detection algorithm active; detection is started every **<interval>** period, using **<detGPIO>** for detection. 2 - triggers the new measurement of the antenna presence, reporting the result in the format: **#GSMAD: <presence>** where: **<presence>** 0 - antenna connected. 1 - antenna connector short circuited to ground. 2 - antenna connector short circuited to power.

	3 - antenna not detected (open). **<urcmode>** - URC presentation mode. It has meaning only if **<mod>** is 1. 0 - it disables the presentation of the antenna detection URC 1 - it enables the presentation of the antenna detection URC, whenever the antenna detection algorithm detects a change in the antenna status; the unsolicited message is in the format: **#GSMAD: <presence>** where: **<presence>** is as before **<interval>** - duration in seconds of the interval between two consecutive antenna detection algorithm runs (default is 120). It has meaning only if **<mod>** is 1. 1..3600 - seconds **<detGPIO>** - defines which GPIO shall be used as input by the Antenna Detection algorithm (default 13).. *Valid range* is "any input pin number" (see "Hardware User Guide"). **<repGPIO>** - defines which GPIO shall be used by the Antenna Detection algorithm to report antenna condition. Value 0 means that no report is made using GPIO (default 0). It has meaning only if **<mod>** is 1. 0 - no report is made using GPIO *Valid range* is "any output pin number" (see "Hardware User Guide"). Note: last **<urcmode>** settings are saved as extended profile parameters. Note: GPIO is set to LOW when antenna is connected. Set to HIGH otherwise Note: **#GSMAD** parameters, excluding **<urcmode>**, are saved in NVM.
AT#GSMAD=?	Test command reports the supported range of values for parameters **<mod>, <urcmode>, <interval>, <detGPIO>** and **<repGPIO>**.
AT#GSMAD?	Read command returns the current parameter settings for **#GSMAD** command in the format: **#GSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>**

3.5.5.1.45. V24 Output Pins Configuration - #V24CFG

#V24CFG - V24 Output Pins Configuration	
AT#V24CFG=<pin>, <mode>	Set command sets the AT commands serial port (**UART**) interface output pins mode. Parameters: **<pin>** - AT commands serial port interface hardware pin:

#V24CFG - V24 Output Pins Configuration	
	0 - **DCD** (Data Carrier Detect) 1 - **CTS** (Clear To Send) 2 - **RI** (Ring Indicator) 3 - **DSR** (Data Set Ready) **<mode>** - AT commands serial port interface hardware pins mode: 0 - AT commands serial port mode: output pins are controlled by serial port device driver. (default) 1 - GPIO mode: output pins are directly controlled by **#V24** command only.
AT#V24CFG?	Read command returns actual mode for all the pins in the format: **#V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF>** **#V24CFG: <pin2>,<mode2>[...]]** Where: **<pin*n*>** - AT command serial port interface HW pin **<mode*n*>** - AT commands serial port interface hardware pin mode
AT#V24CFG=?	Test command reports supported range of values for parameters **<pin>** and **<mode>**.

3.5.5.1.46. V24 Output Pins Control - #V24

#V24 - V24 Output Pins Control	
AT#V24=<pin>[,<state>]	Set command sets the AT commands serial port (UART) interface output pins state. Parameters: **<pin>** - AT commands serial port interface hardware pin: 0 - **DCD** (Data Carrier Detect) 1 - **CTS** (Clear To Send) 2 - **RI** (Ring Indicator) 3 - **DSR** (Data Set Ready) 4 - **DTR** (Data Terminal Ready). This is not an output pin: we maintain this value only for backward compatibility, but trying to set its state raises the result code "ERROR" 5 - **RTS** (Request To Send). This is not an output pin: we maintain this value only for backward compatibility, but trying to set its state raises the result code "ERROR" **<state>** - State of AT commands serial port interface output hardware pins (0, 1, 2, 3) when pin is in GPIO mode (see **#V24CFG**): 0 - Low 1 - High Note: if **<state>** is omitted the command returns state of the pin.
AT#V24?	Read command returns actual state for all the pins in the format: **#V24: <pin1>,<state1>[<CR><LF>**

#V24 - V24 Output Pins Control	
	#V24: <pin2>,<state2>[...]] where **<pin*n*>** - AT command serial port interface HW pin **<state*n*>** - AT commands serial port interface hardware pin state
AT#V24=?	Test command reports supported range of values for parameters **<pin>** and **<state>**.

3.5.5.1.47. Power Saving Mode Ring Indicator - #PSMRI

#PSMRI – Power Saving Mode Ring Indicator	
AT#PSMRI=<n>	Set command enables/disables the Ring Indicator pin response to an URC message while modem is in power saving mode. If enabled, a negative going pulse is generated, when URC message for specific event is invoked. The duration of this pulse is determined by the value of **<n>**. Parameter: **<n>** - **RI** enabling 0 - disables **RI** pin response for URC message(factory default) 50-1150 - enables **RI** pin response for URC messages. Note: the behavior for #PSMRI is invoked only when modem is in sleep mode (AT+CFUN=5 and DTR Off on Main UART)
AT#PSMRI?	Read command reports the duration in ms of the pulse generated, in the format: **#PSMRI: <n>**
AT#PSMRI=?	Reports the range of supported values for parameter **<n>**
Note	When RING signal for incoming call/SMS/socket listen is enabled, the behavior for #PSMRI will be ignored.

3.5.5.1.48. Selection of Radio Access Technology - #SRAT

#SRAT – Selection of Radio Access Technology	
AT#SRAT=<Act>[,<PreferredAct>]	Set command is used to set RAT and proffered RAT value used for further network registration (at+cops=0). This command forces the selection of the Radio Access Technology (RAT) in the protocol stack. On a later network registration (+COPS, +CGATT) this RAT is used. This command is available for phones supporting Dual Mode. In case of GSM / UMTS Dual Mode is selected additionally a preferred RAT can be configured, which is stored in NVM selecting which RAT shall be attached first. Parameter: **< Act >** 0 - GSM single mode 1 - GSM / UMTS Dual mode 2 - UTRAN (UMTS)

#SRAT – Selection of Radio Access Technology	
	< PreferredAct > 0 - RAT GSM 2 - RAT UMTS Note: Dual mode means GSM and UMTS Access Technology will be active and full InterRAT measurements and handovers are provided. Note: The default value is Dual mode with UMTS preffered.
AT#SRAT?	Read command returns the previously set of <Act> and <PreferredAct> values. **#SRAT : <Act>,<PreferredAct>** where: < Act > - see before < PreferredAct > - see before
AT#SRAT=?	Test command returns supported <Act>s and list supported PreferredAct>s

3.5.5.1.49. Extended Error Report for Location Update Reject During CS Registration - #NEER

#NEER - Extended Error Report for Location Update Reject During CS Registration	
AT#NEER	Execution command causes the TA to return one or more lines of information text <report>, determined by the MT manufacturer, which should offer the user of the TA an extended Network error cause report of the reason for the failure in the last unsuccessful CS Registration be returned. **#NEER:<report>** where: **<report>** - extended Network error cause report of the reason for the failure in the last unsuccessful CS Registration be returned.
AT#NEER=?	Test command returns **OK** result code.

3.5.5.1.50. Current Network Registration Status - #REGSTAT

#REGSTAT - Current Network Registration Status	
AT#REGSTAT=<n>	Set command enables/disables network registration status unsolicited result code #REGSTAT. Parameter: **<n>** 0 - disable network registration attach status unsolicited result code 1 - enable network registration attach status unsolicited result code #REGSTAT The URC enabled by parameter <n> is in the format: **#REGSTAT: <State>**

#REGSTAT - Current Network Registration Status	
	where: **<State>** 0 - not registered 1 - registered, GPRS attached 2 - registered, EDGE attached 3 - registered, WCDMA attached 4 - registered, HSDPA attached // with DFS22.21.00, DFSD23.09.01 5 - registered, HSUPA attached // with DFS22.21.00, DFSD23.09.01 6 - registered, HSUPA and HSDPA attached
AT#REGSTAT?	Read command reports the current values of <n> and <State> **#REGSTAT: <n>,<State>** where: **<n>** - see before **<State>** - see before
AT#REGSTAT =?	Test command returns all supported values of the parameters.

3.5.5.1.51. Set Reporting Call Status - #CALLSTAT

#CALLSTAT - Set Reporting Call Status	
AT#CALLSTAT=<enable>	Set command is used to enable/disable the CALLSTAT. This command allows enabling / disabling the reporting voice call status on DTE using an unsolicited result code #CALLSTAT: <call_id><stat>. This code may be repeated so that for each call one line is displayed on DTE (e.g. one call is active and one call is waiting, or up to 6 calls are active in a multiparty session). Parameter: **<enable>** 0 - reporting disabled (default) 1 - reporting enabled **#CALLSTAT: <call_id>,<stat>** where **<call_id>** - indicates the call identification (GSM02.30 4.5.5.1) **<stat>** - indicates the voice call status as follows 0 - active 1 - hold 2 - dialling (MO call) 3 - alerting (MO call; ringing for the remote party) 4 - ringing (MT call) 5 - waiting (MT call) 6 - disconnected 7 - connected (indicates the completion of a call setup first time for MT and MO calls - this is reported in addition to state active)
AT#CALLSTAT?	Read command reports the current value of the parameter.

#CALLSTAT - Set Reporting Call Status	
AT#CALLSTAT=?	Test command returns all supported values of the parameter.

3.5.5.1.52. GPRS cell environment description - #CGED

#CGED – GPRS cell environment description	
AT#CGED=<mode>	This command returns a dump of the cell environment, either as a one shot dump or as a periodic refreshed dump (each 5 seconds), dependent on the command parameter <mode>. The displayed parameters are dependent on the fact whether the UMTS is supported and if it is, dependent on the currently supported RAT (GSM, UMTS). Parameter: **<mode>** 0 - one shot dump 1 - periodic refreshed dump 2 - stop periodic dump Response syntax in case of UMTS radio access technology (RAT): **#CGED: RAT:<rat>,** **URR:<rrc_state>,** **DC:<urrcdc_state>, BP:<urrcbp_state>, M:<urrcm_state>,** **ERR:<as_error_code>, RC:<release_cause>,** **OOS:<out_of_service>,** **BLER:<meas_bler>,TSIR:<target_sir>,MSIR:<meas_sir>,** **HSC:<hierarchical_cell_structure>, HMD:<high_mobility_detected>,** **LM:<limited_mode>,** **Cell-ID:<cell_identity>, DLF:<dl_frequency>, ULF:<ul_frequency>,** **C:<ciphering>, D:<ps_data_transfered>,** **PSM:< power_saving_mode>,** **Cell:<celltype=AS>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>** **Cell:<celltype=VAS>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>,** **DLF:<dl_frequency>** **Cell:<celltype=M>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>** **Cell:<celltype=D>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>** **Cell:<celltype=G>, B:<gsm_band>,Arfcn:<arfcn>, Rssi:<rssi>, Bsic:<bsic>,** **RV:<ranking_value>** **Cell:<celltype=U>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>,** **DLF:<dl_frequency>,** **RV:<ranking_value>** **Cell:<celltype=NU>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>,** **DLF:<dl_frequency>,** **RS:<ranking_status>** **Cell:<celltype=NG>, B:<gsm band>, Arfcn:<arfcn>, Rssi:<rssi>, Bsic:<bsic>,** **RS:<ranking_status>** **RR measurement evaluation:** **MeasId:<meas_id>, EventId:<event_id>, <par 3>, <par 4>, <par 5>, <par**

#CGED – GPRS cell environment description	
	6>,..., <par N>, **MeasId:<meas_id>, EventId:, <par 3>, <par 4>, <par 5>, <par 6>,..., <par M>,** **etc...** **MM:** **Process:CO, MMs:<mm_state>, MMSs:<mm_service_state>,** **MSC:<ms_class>, T:<active_timer_bitmap>** **Process:CS, MMs:<mm_state>, MMSs:<mm_service_state>,** **LUS:<location_update_status>,** **T:<active_timer_bitmap>, L:<limited_service>** **Process:PS, MMs:<mm_state>, MMSs:<mm_service_state>,** **LUS:<location_update_status>,** **T:<active_timer_bitmap>, L:<limited_service>, GS:<gprs_supported>,** **R:<ready_state>** **Cell change counters:** **CRT:<cell_reselecetion_total>, IRCR:<ir_cell_reselecetion>,** **AIRCR:<attempted_ir_cell_reselecetion>,IRHO:<ir_handover>,** **AIRHO:<attempted_ir_handover>** **Serving PLMN:** **MCC:<mobile_country_code>, MNC:<mobile_network_code>,** **LAC:<location_area_code>, RAC:<routing_area_code>** **Equivalent PLMNs:** **MCC:<mobile_country_code>, MNC:<mobile_network_code>** **GPRS-Parameters:** **GPRS_sup:<GPRS_sup>, RAC:<RAC>, SplitPg:<Split_Pg_Cycle>,** **NCO:<NCO>, NOM:<NOM>, T3192:<T3192>,** **Acc_Burst_type:<Acc_Burst_type>, DRX_Timer_Max:<DRX_Timer_Max>,** **PBCCH:<PBCCH>, Ext_Measure_Order:<Ext_Measure_Order>** **PSI1_r_per:<PSI1_r_per>,si13_location:<si13_location>,packet_psi_status:<packet_psi_status>,packet_si_status:<packet_si_status>,ext_upl_tbf_supported:<ext_upl_tbf_supported>, ccn_active:<ccn_active>,** **pfc_feat_supported:<pfc_feat_supported>** **Count_LR:<Count_LR>,Count_HR:<Count_HR>,C_R_Hyst:<C_R_Hyst>,** **C31:<C31>, C32:<C32>, Prior_Acc_Thr:<Prior_Acc_Thr>** Note: the total number of cells can be max 24 Response syntax in case of GSM/GPRS radio access technology (RAT): **#CGED: RAT: <rat>,** **RR:<rr_state>** **SFRLC:<signal_failure/radio_link_counter>, RSR:<reselection_reason>,** **RC:<release_cause>,** **LM:<limited_mode>** **B:<gsm_band>, Arfcn:<arfcn>, Rssi:<rssi>, C1:<c1>, C2:<c2>, Bsic:<bsic>,** **MA:<nr_of_rf_in_ma>,MADed:<dedicated_arfcn>,** **GSM: B:<gsm_band>, Arfcn:<arfcn>, Rssi:<rssi>, C1:<c1>, Bsic:<bsic>**

#CGED – GPRS cell environment description	
	UMTS: SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>, DLF:<dl_frequency> **MM:** **Process:CO, MMs:<mm_state>, MMSs:<mm_service_state>, MSC:<ms_class>, T:<active_timer_bitmap>** **Process:CS, MMs:<mm_state>, MMSs:<mm_service_state>, LUS:<location_update_status>,** **T:<active_timer_bitmap>, L:<limited_service>** **Process:PS, MMs:<mm_state>, MMSs:<mm_service_state>, LUS:<location_update_status>,** **T:<active_timer_bitmap>, L:<limited_service>, GS:<gprs_supported>, R:<ready_state>** **Cell change counters:** **CRT:<cell_reselecetion_total>, IRCR:<ir_cell_reselection_counter>, AIRCR:<attempted_ir_cell_reselection>,IRHO:<ir_handover>, AIRHO:<attempted_ir_handover>** **Coding Scheme:** **dl_sc:<dl_sc>,ul_sc:<ul_sc>** **Serving PLMN:** **MCC:<mobile_country_code>, MNC:<mobile_network_code>, LAC:<location_area_code>,** **RAC:<routing_area_code>, AcT:<access technology>** **Equivalent PLMNs:** **MCC:<mobile_country_code>, MNC:<mobile_network_code>** Note: Up to 6 GSM + 24 UMTS cells may need to be displayed. Parameter definitions, if UMTS is not supported, follow. Service-Cell: **<MCC>** - Mobile country code, range 0-999 (3 digits) **<MNC>** - Mobile network code, range 0-99 (2 digits) **<LAC>** - Location area code, range 0h-FFFFh (2 octets) **<CI>** - Cell Identity, range 0h-FFFFh (2 octets) **<BSIC>** - Base Station Identify Code, range 0h-3Fh (6bits) **<AcT>** - Access Technology, range 0..8, GSM=0, GPRS=1, EGPRS=2, EGPRS_PCR=3, EGPRS_EPCR=4, UMTS=5 (unused), DTM=6, EGPRS_DTM=7, undefined=8 **<arfcn>** - absolute radio frequency chanel number, range 0-1023 **<RfChannels>** - number of frequencies in MA, no_of_rf_chans : 0x01 if single RF and 0 if n.a. **<Arfcn_ded>** - single ARFCN of dedicated channel of first ARFCN of MA **<RxLevFull>** - Received signal strength on serving cell, measured on all slots; 0h-3Fh; 10.5.2.20 GSM04.08 **<RxLevSub>** - Received signal strength on serving cell, measured on all slots; 0h-3Fh; 10.5.2.20 GSM04.08 **<RxQualFull>** - Received signal quality on serving cell, measured on all slots;

#CGED – GPRS cell environment description	
	range 0-7; 10.5.2.20 GSM04.08 **<RxQualSub>** - Received signal qual.onserving cell, measured on a subset of slots, range 0-7;10.5.2.20 GSM04.08 **<ms_txpwr>** - Maximum TX power level an MS may use when accessing the system until otherwise commanded, range 0-31; 10.5.2.4 GSM08.08 **<rx_acc_min>** - RXLEV-ACCESS-MIN, range 0-63; 10.5.2.4 GSM04.08 **<cbq>** - CELL_BAR_QUALIFY, range 0-1; 10.5.2.34 GSM04.08 **<cba>** - CELL_BAR_ACCESS, range 0-1; 10.5.2.29 GSM04.08 **<cs_valid>** - True if all parameter for calculation of c2 are available; boolean **<cr_offset>** - CELL_RESELECT_OFFSET, range 0-63 (6 bit); 10.5.2.34 GSM04.08 **<tmp_offset>** - TEMPORARY_OFFSET, range 0-7 mapped to 0-70; 10.5.2.34 GSM04.08 **<penalty_t>** - Penalty time, range 0-31; 10.5.2.34 GSM04.08 **<c1>** - Value of c1; 6.4 GSM04.08 **<c2>** - Value of c2; 6.4 GSM04.08 **<ch_type>** - Channel type of the current connection as follows (10.5.2.5 GSM04.08) see type T_CHANNEL_MODE): 0 - INVALID_CHN_TYPE 1 - TCH_F 2 - TCH_F 3 - SDCCH_4 4 - SDCCH_8 5 - TCH_H_H 6 - TCH_F_M **<ch_mode>** - Channel mode of current connection (10.5.2.6 GSM04.08), range 0-255 mapped to an internal value: 0 - MODE_SIG_ONLY 1 - MODE_SPEECH_F 2 - MODE_SPEECH_H 3 - MODE_DATA_96_F 4 - MODE_DATA_48_F 5 - MODE_DATA_48_H 6 - MODE_DATA_24_F 7 - MODE_DATA_24_H 8 - MODE_SPEECH_F_V2 9 - MODE_SPEECH_F_V3 10 - MODE_SPEECH_H_V2 11 - MODE_SPEECH_H_V3 12 - MODE_DATA_144_F **<txpwr>** - Transmit power level of the current connection, range 0-31 (5 bits); 10.5.2.4 GSM04.08 **<dtx_used>** - DTX used, range 0-1; 10.5.2.4 GSM04.08 **<dtr_used>** - DTX used, range 0-1; **<t3212>** - T3212. The T3212 timeout value field is coded as the binary representation of the timeout value for periodic updating in decihours; range 0-255 (8 bits); 10.5.2.11 GSM04.08 **<acc>** - Access control class (RACH Control Parameters), range 0-65535 (2

#CGED – GPRS cell environment description	
	octets); 10.5.2.29 GSM04.08 **<t_adv>** - Timing Advance, not used, always FFh **<bs_pa_mfrms>** - BS_PA_MFRMS (multiframes period for transmission of PAGING REQUEST), range 0-7 mapped to 2-9; 10.5.2.11 GSM04.08 **<amr_acs>** - AMR active codec **<amr_cod_dl>** - AMR codec used in DL **<amr_cod_ul>** - AMR codec used in UL **<amr_ci_i>** - AMR C/I in dB/2 **<mean_bep_8psk>** - MEAN_BEP_8PSK[0...31] **<cv_bep_8psk>** - CV_BEP_8PSK[0...7] **<mean_bep_gmsk>** - MEAN_BEP_GMSK[0...31] **<cv_bep_gmsk>** - CV_BEP_GMSK[0...7] GPRS-Parameters: **<GPRS_sup>** - GPRS supported (in serving cell); range 0-255 (8 bits); 10.5.2.37b GSM04.08 **<RAC>** - Routing Area Code, range 0-1 (i bit);10.5.2.37b GSM04.08 **<Split_Pg_Cycle>** - SPGC_CCH_SUP split pg_cycle on ccch by network, range 0-1 (2 bits); 10.5.2.37b GSM04.08 **<NCO>** - NETWORK_CONTROL_ORDER (GPRS_Cell_Options), range 0-3 (2 bits); 10.5.2.37b GSM04.08 **<NOM>** - NETWORK OPERATION MODE (GPRS_Cell_Options), range 0-3 (2 bits); 10.5.2.37b GSM04.08 **<T3192>** - T3192 (Wait for Release of the TBF after reception of the final block), range 0-7 mapped to 0-1500 msec (3 bits); 12.24 GSM04.60: 500 msec 1000 msec 1500 msec 0 msec 80 msec 120 msec 200 msec **<Acc_Burst_type>** - ACCESS_BURST_TYPE (Literal AB_8 and AB_11), range 0-1 mapped to 8,11 (1 bit); 12.24 GSM04.60 **<DRX_Timer_Max>** - DRX_TIMER_MAX, range 0-7 (3 bits); 12.24 GSM04.60 **<PBCCH>** - PBCCH present, boolean; 11.2.25 GSM04.60 <Ext_Measure_Order> - EXT_MEASUREMENT_ORDER, range 0-3 (2 bits); 11.2.23 GSM04.60 **<PSI1_r_per>** - PSI1_REPEAT_PERIOD, range 0-15 mapped to 1-16 (4 bits); 11.2.18 GSM04.60 **<si14_location>** “BCCH_NORM” “BCCH_EXT” “NO_BCCH_TYPE” **<packet_psi_status>** - may be 0-1 **<packet_si_status>** - may be 0-1

#CGED – GPRS cell environment description	
	<ext_upl_tbf_supported> - may be 0-1 **<ccn_active>** - may be 0-1 **<pfc_feat_supported>** - may be 0-1 **<dl_sc>** and **<ul_sc>** - current Modulation and Coding Scheme of downlink(<dl_sc>) or uplink(<ul_sc>) TBF may be: NB_CS_1 NB_CS_2 NB_CS_3 NB_CS_4 NB_MCS_1 NB_MCS_2 NB_MCS_3 NB_MCS_4 NB_MCS_5 NB_MCS_6 NB_MCS_7 NB_MCS_8 NB_MCS_9 NB_MCS_5_7 NB_MCS_6_9 AB_8 AB_11 AB_11_E **<Count_LR>** - PSI_COUNT_LR, range 0-63 (4 bits); 11.2.18 GSM04.60 **<Count_HR>** - PSI_COUNT_HR, range 0-15 mapped to 1-16 (4 bits); 11.2.18 GSM04.60 **<C_R_Hyst>** - CELL-RESELECT-HYSTERESIS, range 0-7 (3 bits); 10.5.2.4 GSM04.08 **<C1>** - Value of c1, integer **<C2>** - Value of c2, integer **<C31>** - Value of c31, integer **<C32>** - Value of c32, integer **<Prior_Acc_Thr>** - Prioriry_ACCESS_THR, range 0-7 (3 bits);10.5.2.37b GSM04.08 Parameter definitions, if UMTS is supported follow: **<rat>** - currently selected Radio Access Technologie (RAT) and may be: "UMTS" "GSM" UMTS RR PARAMETERS: **<rrc_state>** - may be "CD", "CF", "CP", "UP", "ID", "ST"- standing for CELL_DCH (0), CELL_FACH(1), CELL_PCH(2), URA_PCH(3), IDLE(4), START(5) **<urrcdc_state>** - indicated by three hex digits, (octet1,2:event, 3:state) **<urrcbp_state>** - indicated by four hex digits, (1,2:event, 3,4:state)

#CGED – GPRS cell environment description	
	<urrcm_state> - indicated by three hex digits (1:event, 2:state, 3:nr of sent measurements) **<as_error_code>** - indication about error in UAS; integer, range 0-99 **<release_cause>** - integer, range 0-99 **<out_of_service>** - may be 0-1 **<meas_bler>** - block error rate, range 1.0 *10exp(-6) … 9.9*10exp(-1); the value - is indicated if the parameter is not available or for all cells except DCH; the internal received value is divided by 2^23 before display; **<target_sir>** - target SIR, range -10 … +20 (3 digits are always displayed); the value '-' is displayed if the parameter is not available or for all cells except DCH; the internal received value is divided by 2^24 before display; **<meas_sir>** - integer displayed in hexadecimal format, range -10 … +20; the value '-' is displayed if the parameter is not available or for all cells except DCH; the internal received value is divided by 2^24 before display; **<hierarchical_cell_structure>** - may be 0-1 **<high_mobility_detected>** - may be 0-1 **<limited_mode>** - may be 0-1 **<cell_identity>** - indicated by seven hex digits **<dl_frequency>** - integer, range 0-16383 **<ul_frequency>** - integer, range 0-16383 **<ciphering>** - the GSM Ciphering may be ON or OFF **<gprs_ciphering>** - It is the GPRS Ciphering Algorithm GEA1 - GEA7 **<ps_data_transfered>** - may be 0-1 **<power_saving_mode>** - may be 0-1 **<cell_type>** "AS" - Active Set, "VAS"- Virtual Active Set "M", - Monitored Cells "D", - Detected Cells "G", - GSM cells "U", - UMTS cells "NU",- Non Ranked UMTS cells "NG" - Non Ranked GSM cells **<scrambling_code>** - integer, range 0-511 **<rscp>** - Received Signal Code Power, range 0-91 **<ecno>** - energy per chip/noice, range 0-24 **<gsm_band>** "D",- 1800 MHz "P",- 1900 MHz "G" - 900 MHz **<arfcn>** - absolute radio frequency channel number, range 0-1023 **<rssi>** - radio signal strength -110 … - 48 (negative values) **<bsic>** - base station identify code, range 0-3Fh (6 bits) **<ranking_value>** - integer, range 0-999 **<ranking_status>** - integer, range 0-9

#CGED – GPRS cell environment description	
	MEASUREMENT PARAMETERS: ---------- **<meas_id>** - one hex digit, range 0-FH **<event_id>** - two hex digits 1AH-3DH **<par 3,4,5,…,M,..,N>** - integer, range 0-99 GSM RR PARAMETERS: ---------- **<signal_failure/radio_link_counter>** - integer, range 0-99 in case of grr_state == GRR_IDLE (11) Downlink Signaling Counter will be printed in case of grr_state == GRR_RR_CONNECTION (28) Radio Link Loss Counter will be printed **<reselection_reason>** - integer, range 0-99 0 - RESEL_PLMN_CHANGE 1 - RESEL_SERV_CELL_NOT_SUITABLE 2 - RESEL_BETTER_C2_C32 3 - RESEL_DOWNLINK_FAIL 4 - RESEL_RA_FAILURE 5 - RESEL_SI_RECEIPT_FAILURE 6 - RESEL_C1_LESS_NULL 7 - RESEL_CALL_REEST_TIMEOUT 8 - RESEL_ABNORMAL_RESEL 9 - RESEL_CELL_CHANGE_ORDER 10 - RESEL_NOT_OCCURRED **<c1>** - integer, range 0-99 (6.4 GSM04.08) **<c2>** - integer, range 0-99 (6.4 GSM04.08) **<nr_of_rf_in_ma>** - integer, range 0-99 **<dedicated_arfcn>** - dedicated arfcn, range 0-1023 **<dl_sc>** and **<ul_sc>** - current Modulation and Coding Scheme of downlink(<dl_sc>) or uplink(<ul_sc>) TBF may be: NB_CS_1 NB_CS_2 NB_CS_3 NB_CS_4 NB_MCS_1 NB_MCS_2 NB_MCS_3 NB_MCS_4 NB_MCS_5 NB_MCS_6 NB_MCS_7 NB_MCS_8 NB_MCS_9 NB_MCS_5_7 NB_MCS_6_9 AB_8

#CGED – GPRS cell environment description	
	AB_11 AB_11_E UMTS/GSM MM PARAMETERS: <**mm_state**> - integer, range 0-99 <**mm_service_state**> - integer, range 0-99 <**ms_class**> - the MS GPRS-class (previously stored in ATC either at reception of message MN_GCLASS_IND or sending the message MN_GCLASS_REQ); it may be: class A class B class CG: class C in GPRS only mode classCC: class C in circuit switched only mode (lowest class) <**active_timer_bitmap**> - four hex coded digits <**location_update_status**> - integer, range 0-9 <**limited_service**> - may be 0-1 <**gprs_supported**> - may be 0-1 <**ready_state**> - may be 0-1 <**cell_reselecetion_total**> - integer, range 0-999 <**ir_cell_reseelection_counter**> - integer, range 0-999 <**attempted_ir_cell_reselection**> - integer, range 0-999 <**ir_handover**> - integer, range 0-999 <**attempted_ir_handover**> - integer, range 0-999 <**mobile_country_code**> - MCC three hexcoded digits, range 0-999 <**mobile_network_code**> - MNC two hexcoded digits, range 0-99 <**location_area_code**> - LAC, two octets, range 0-65535 <**routing_area_code**> - integer, range 0-255 <**access technology**> - integer, range 0..8, GSM=0, GPRS=1, EGPRS=2, EGPRS_PCR=3, EGPRS_EPCR=4, UMTS=5 (unused), DTM=6, EGPRS_DTM=7, undefined=8
AT#CGED?	Read command reports the current value of the parameter.
AT#CGED=?	Test command returns all supported values of the parameter.

3.5.5.1.53. Provide Cell information - #CELLINFO

#CELLINFO – Provide Cell information	
AT#CELLINFO=<mode>	This command provides a periodic reporting of the serving cell and the neighbour cells. Parameter: <**mode**> 0 - disable the periodic reporting 1 - enable the reporting 2 - currently not used (backward compatibility)

#CELLINFO – Provide Cell information	
	For GSM cells: **URC: #CELLINFO:** **<type>,<MCC>,<MNC>,<LAC>,<CI>,<RxLev>[,<t_advance>]** For UMTS cells: **URC: #CELLINFO:** **<type>,<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>,** **<dl_frequency>,<rscp>,<ecn0>** where: **<type>** 0 - GSM serving cell 1 - GSM neighbour cell 2 - UMTS serving cell 3 - UMTS neighbour cell 4 - UMTS detected cell **<MCC>,<MNC>,<LAC>,<CI>,<scrambling_code>,<rscp>,<ecn0>,<dl_frequency>** - see #CGED **<RxLev>** - signal strength **<t_advance>** - only valid for the serving cell
AT#CELLINFO?	**#CELLINFO: <mode>,<type>,<MCC>,** **<MNC>,<LAC>,<CI>,<RxLev> [,<t_advance>]** **#CELLINFO: <mode>,<type>,<MCC>,** **<MNC>,<LAC>,<CI>,<scrambling_code>,<dl_frequency>,<rscp>,** **<ecn0>**
AT#CELLINFO=?	Test command returns the range of supported **<mode>**s.

3.5.5.1.54. Debug screen command - #DBGS

#DBGS – Debug screen command	
AT#DBGS= **<mode>[,<page_nr>]**	This command returns a dump of the cell environment, either as a one shot dump or as a periodic refreshed dump (each 5 seconds), dependent on the command parameter <mode>. The displayed parameters are dependent on the fact whether the UMTS is supported (Note: define UMTS_SUPPORT exists) and if it is, dependent on the currently supported RAT (GSM, UMTS). Parameter: **<mode>** 0 - one shot dump 1 - periodic refreshed dump (is not allowed for page_nr=6) 2 - stop periodic dump (is not allowed for page_nr=6) **<page_nr>** 1-8 number of response page (see response syntax description above), where 1 is used if this parameter is not stated Response syntax for page_nr 1

#DBGS – Debug screen command	
	#DBGS: **RAT:<rat>,** **MCC:<mobile_country_code>, MNC:<mobile_network_code>,** **MMs: <mm_state>, LUS: <location_update_status>, LAC: <LAC>, MMSs: <mm_service_state>, T: <active_timer_bitmap>, B: <band>,** Only if RAT:"GSM" **RR: <rr_state>, Arfcn: <arfcn>, Arfcn_ded: <arfcn_ded>, Bsic: <bsic>, Rssi: <rssi>,** **C1: <c1>, RxQualFull: <RxQualFull>, txpwr:<txpwr>, rx_power_level: <rx_power_level>,** **amr_codec_set:<amr_codec_set>,** **amr_cod_ul :<amr_cod_ul>,amr_cod_dl:<amr_cod_dl>** Only if RAT:"UMTS" **URR: <rrc_state>, DLF: <dl_frequency>, PSC:<scrambling_code>,** **RSCP:<rscp>, ECN0: <ecn0>, rx_power_level: <rx_power_level>** **DRX_cycle : <drx_cycle>** **CallConnect : <call_connect>** Response syntax for page_nr 2: **#DBGS:** **RAT:<rat>,** **MCC:<mobile_country_code>, MNC:<mobile_network_code>,** Only if RAT:"GSM" **RSR: <reselection_reason>,RC:<release_cause>, ch_type:<ch_type>,** **ch_mode:<ch_mode>, ndsc:<dsc>,** **rll:<rll>, t3212:<t3212>,** Only if RAT:"GSM" **RxLevFull:<RxLevFull>,RxLevSub:<RxLevSub>,RxQualFull:<RxQualFull>,** **RxQualSub:<RxQualSub>,** Only if RAT:"GSM" **rx_acc_min: <rx_acc_min>, C1: <c1>, C2: <c2>, txpwr:<txpwr>,** **dtx_used:<dtx_used>** Only if RAT:"UMTS" **URR: <rrc_state>, PSM: <power_saving_mode>, D:<ps_data_transfered>,** **RC:<release_cause>,** Only if RAT:"UMTS" **ul_meas_cnt:<ul_meas_cnt>, oos_cnt:<oos_cnt>, tx_pwr: <tx_pwr>,** **C:<ciphering>** Response syntax for page_nr 3

#DBGS – Debug screen command	
	#DBGS: **no_ncells: <no_ncells>,** The next line is repeated by the number of neighbour GSM cells which have been found **Arfcn:<arfcn>, Bsic: <bsic>, Rssi: <rssi>, C2: <c2>,** **no_umts:ncells: <no_umts_ncells>,** The next line is repeated by the number of neighbour UMTS cells which have been found **DLF: <dl_frequency>, SC: <scrambling_code>, RSCP:<rscp>, ECN0: <ecn0>** Response syntax for page_nr 4 **#DBGS:** **AcT: <access technology>,** **RAC: <RAC>, MMs: <mm_state>, LUS: <location_update_status>,** **MMSs: <mm_service_state>,** **NOM: <NOM>, NCO: <NCO>, T: <active_timer_bitmap>, T3192: <T3192>,** **GPRS Ciphering Algorithm: GEA<gprs_ciphering>, PBCCH: <PBCCH>** Response syntax for page_nr 5 **#DBGS:** **RAT:<rat>,** **MCC:<mobile_country_code>, MNC:<mobile_network_code>,** **MMs: <mm_state>, LUS: <location_update_status>, MMSs: <mm_service_state>,** Only if RAT:"UMTS" **URR: <rrc_state>, BP: <urrcbp_state>, DC: <urrcdc_state>, M: <urrcm_state>** **ciph:<ciphering>, integr_prot:<integr_prot>** Response syntax for page_nr 6 **#DBGS:** **SIM Phase: <SIM_phase>, 2G PB: <2G_PB_supp>, UGlobalPB: <USIM_globPB_supp>, UApplPB: <USIM_applPB_supp>** Response syntax for page_nr 7 Handover Statistics : **#DBGS:** **Total time: <total_time>, 2G time: <2G_time>, 3G time: <3G_time>,** **Cr2g2gCntSu: <cr_2g_2g_cnt_su>,** **Cr2g2gCntAt: <cr_2g_2g_cnt_at>, IrCr2g3gCntSu: <ir_cr_2g_3g_cnt_su>,**

#DBGS – Debug screen command	
	IrCr2g3gCntAt: **<ir_cr_2g_3g_cnt_at>, IrHocc2g3gCntSu: <ir_hocc_2g_3g_cnt_su>, IrHocc2g3gCntAt:** **<ir_hocc_2g_3g_cnt_at>, Ho2g2gCntSu: <ho_2g_2g_cnt_su>, Ho2g2gCntAt: <ho_2g_2g_cnt_at>,** **Cr3g3gCntSu: <cr_3g_3g_cnt_su>, Cr3g3gCntAt: <cr_3g_3g_cnt_at>, IrCr3g2gCntSu: <ir_cr_3g_2g_cnt_su>,** **IrCr3g2gCntAt: <ir_cr_3g_2g_cnt_at>, IrHocc3g2gCntSu:** **<ir_hocc_3g_2g_cnt_su>, IrHocc3g2gCntAt:** **<ir_hocc_3g_2g_cnt_at>, Ho3g3gCntSu: <ho_3g_3g_cnt_su>, Ho3g3gCntAt: <ho_3g_3g_cnt_su>.** Response syntax for page_nr 8 **#DBGS:** **Rssi: <rssi>, SC_RAT: <sc_rat>, SC_Band:<sc_band>, THERM_ADC: <therm_adc>, BATT_ADC:<batt_adc>** Note : if certain parameters are not available, then "-" is printed instead, e. g. "NOM: -". where: **<MCC>** - Mobile country code, range 0-999 (3 digits) **<MNC>** - Mobile network code, range 0-99 (2 digits) **<LAC>** - Location area code, range 0-65535 (5 digits) **<arfcn>** - absolute radio frequency chanel number, range 0-1023 **<RxLevFull>** - Received signal strength on serving cell, measured on all slots; 0h-3Fh; 10.5.2.20 GSM04.08 **<RxLevSub>** - Received signal strength on serving cell, measured on all slots; 0h-3Fh; 10.5.2.20 GSM04.08 **<RxQualFull>** - Received signal quality on serving cell, measured on all slots; range 0-7; 10.5.2.20 GSM04.08 **<RxQualSub>** - Received signal qual.onserving cell, measured on a subset of slots, range 0-7;10.5.2.20 GSM04.08 **<rx_acc_min>** - RXLEV-ACCESS-MIN, range 0-63; 10.5.2.4 GSM04.08 **<c1>** - Value of c1; 6.4 GSM04.08 **<c2>** - Value of c2; 6.4 GSM04.08 **<txpwr>** - Transmit power level of the current connection, range 0-31 (5 bits); 10.5.2.4 GSM04.08 **<dtx_used>** - DTX used, range 0-1; 10.5.2.4 GSM04.08 **<t3212>** - T3212. The T3212 timeout value field is coded as the binary representation of the timeout value for periodic updating in decihours; range 0-255 (8 bits); 10.5.2.11 GSM04.08 **<RAC>** - Routing Area Code, range 0-1 (i bit);10.5.2.37b GSM04.08 **<NCO>** - NETWORK_CONTROL_ORDER (GPRS_Cell_Options), range 0-3

#DBGS – Debug screen command	
	(2 bits); 10.5.2.37b GSM04.08 <NOM>NETWORK OPERATION MODE (GPRS_Cell_Options), range 0-3 (2 bits); 10.5.2.37b GSM04.08 <T3192>T3192 (Wait for Release of the TBF after reception of the final block), 12.24 GSM04.60 (range 0x0000 - 0xFFFF, 0xFFFF means invalid value) **<PBCCH>** - PBCCH present, boolean; 11.2.25 GSM04.60 **<rat>** - currently selected Radio Access Technologie (RAT) and may be: "UMTS" "GSM" **<rrc_state>** - may be "CD", "CF", "CP", "UP", "ID", "ST"- standing for CELL_DCH (0), CELL_FACH(1), CELL_PCH(2), URA_PCH(3), IDLE(4), START(5) **<urrcdc_state>** - indicated by three hex digits, (octet1,2:event, 3:state) **<urrcbp_state>** - indicated by four hex digits, (1,2:event, 3,4:state) **<urrcm_state>** - indicated by three hex digits (1:event, 2:state, 3:nr of sent measurements) **<release_cause>** - integer, range 0-99 **<dl_frequency>** - integer, range 0-16383 **<ciphering>** - the GSM Ciphering may be 0-1 **<gprs_ciphering>** - It is the GPRS Ciphering Algorithm GEA1 - GEA7 **<ps_data_transfered>** - may be 0-1 **<power_saving_mode>** - may be 0-1 **<scrambling_code>** - integer, range 0-511 **<rscp>** - Received Signal Code Power (dBm - absolute value) **<ecno>** - energy per chip/noice, range 0-24 **<band>** "D" - DCS 1800 MHz "P" - PCS 1900 MHz "G" - GSM bands: 900 MHz, 850 MHz “U” - UMTS bands **<arfcn>** - absolute radio frequency channel number, range 0-1023 **<rssi>** - radio signal strength in steps 0..63 **<bsic>** - base station identify code, range 0-3Fh (6 bits) **<reselection_reason>** - integer, range 0-99 **<c1>** - integer, range 0-99 (6.4 GSM04.08) **<c2>** - integer, range 0-99 (6.4 GSM04.08) **<mm_state>** - integer, range 0-99 **<mm_service_state>** - integer, range 0-99 **<active_timer_bitmap>** - four hex coded digits **<location_update_status>** - integer, range 0-9 **<access technology>** - integer, range 0..8, GSM=0, GPRS=1, EGPRS=2, EGPRS_PCR=3, EGPRS_EPCR=4,

#DBGS – Debug screen command

UMTS=5 (unused), DTM=6, EGPRS_DTM=7, undefined=8

<no_ncells> - Number of GSM neighbour cells
<no_umts_ncells> - Number of DETECTED UMTS cells (CELL_DCH) or Number of UMTS neighbour cells (all states but CELL_DCH)

<rr_state> - values 1-35
STATE GRR_START 1
STATE GRR_WAIT_FOR_ACT 2
STATE GRR_CELL_SELECTION 3
STATE GRR_WAIT_CELL_SELECTION 4
STATE GRR_DEACT_CELL_SELECTION 5
STATE GRR_SELECT_ANY_CELL 6
STATE GRR_WAIT_SELECT_ANY_CELL 7
STATE GRR_DEACT_SELECT_ANY_CELL 8
STATE GRR_WAIT_INACTIVE 9
STATE GRR_INACTIVE 10
STATE GRR_IDLE 11
STATE GRR_PLMN_SEARCH 12
STATE GRR_WAIT_PLMN_SEARCH 13
STATE GRR_CELL_RESELECTION 14
STATE GRR_WAIT_CELL_RESELECTION 15
STATE GRR_ABORT_PLMN_SEARCH 16
STATE GRR_DEACT_PLMN_SEARCH 17
STATE GRR_CELL_CHANGE 18
STATE GRR_CS_CELL_CHANGE 19
STATE GRR_WAIT_CELL_CHANGE 20
STATE GRR_SINGLE_BLOCK_ASSIGN 21
STATE GRR_DOWNL_TBF_EST 22
STATE GRR_UPL_TBF_EST 23
STATE GRR_WAIT_TBF 24
STATE GRR_TRANSFER 25
STATE GRR_MO_CON_EST 26
STATE GRR_MT_CON_EST 27
STATE GRR_RR_CONNECTION 28
STATE GRR_CALL_REESTABLISH 29
STATE GRR_NORMAL_CHN_REL 30
STATE GRR_LOCAL_CHN_REL 31
STATE GRR_WAIT_IDLE 32
STATE GRR_DEACTIVATION 33
STATE GRR_IR_CELL_RESEL_TO_UTRAN 34
STATE RR_INACTIVE 35

<ecn0> - ECN0 (dB - positive value presented positive) of cell

<dsc> - Downlink Signaling Counter

<rll> - Radio Link Loss Counter

#DBGS – Debug screen command	
	<ul_meas_cnt> - Number of measurements sent during the last reporting period **<oos_cnt>** - Number of times UE went out of service **<tx_pwr>** - Tx output power **<ch_type>** - Channel type of the current connection as follows (10.5.2.5 GSM04.08), (range 0x00 - 0xFF, 0xFF means invalid value): 00 - INVALID_CHN_TYPE 01 - TCH_F 02 - TCH_H 03 - SDCCH_4 04 - SDCCH_8 05 - TCH_H_H 06 - TCH_F_M **<ch_mode>** - Channel mode of current connection (10.5.2.6 GSM04.08), (range 0x00 - 0xFF, 0xFF means invalid value) mapped to an internal value: 00 - MODE_SIG_ONLY 01 - MODE_SPEECH_F 02 - MODE_SPEECH_H 03 - MODE_DATA_96_F 04 - MODE_DATA_48_F 05 - MODE_DATA_48_H 06 - MODE_DATA_24_F 07 - MODE_DATA_24_H 08 - MODE_SPEECH_F_V2 09 - MODE_SPEECH_F_V3 0A - MODE_SPEECH_H_V2 0B - MODE_SPEECH_H_V3 0C - MODE_DATA_144_F **<rx_power_level>** - signal strength dBm (negative values) **<SIM_phase>** 0 - 3G 2 - 2G **<2G_PB_supp>** 0 - supported 1 - not supported **<USIM_globPB_supp>** 0 - supported 1 - not supported **<USIM_applPB_supp>**

#DBGS – Debug screen command	
	0 - supported 1 - not supported **<drx_cycle>** - DRX cycle frame length **<call_connect>** 0 - If no call is active or hold. 1 - If at least 1 call is active or hold. **<rssi_1>** - radio signal strength 0-31,99 **<sc_rat>** - currently selected Radio Access Technologie (RAT) and may be: "WCDMA" "GSM" **<sc_band>** "D" - DCS 1800 MHz "P" - PCS 1900 MHz "G" - GSM bands: 900 MHz, 850 MHz, 450 MHz, 480 MHz, 750 MHz “U” - UMTS bands **<therm_adc>** - Thermal ADC value (Temperature) **<batt_adc>** - Battery ADC value (Voltage) **<total_time>** - total time connected to Network **<2G_time>** - time connected to 2G Network **<3G_time>** - time connected to 3G Network **<cr_2g_2g_cnt_su>** - number of successful intra GSM cell reselections or cell changes **<cr_2g_2g_cnt_at>** - number of attempted intra GSM cell reselections or cell changes **<ir_cr_2g_3g_cnt_su>** - number of successful GSM to UMTS cell reselections or cell changes **<ir_cr_2g_3g_cnt_at>** - number of attempted GSM to UMTS cell reselections or cell changes **<ir_hocc_2g_3g_cnt_su>** - number of successful GSM to UMTS HO **<ir_hocc_2g_3g_cnt_at>** - number of attempted GSM to UMTS HO **<ho_2g_2g_cnt_su>** - number of successful INTRA GAS handovers **<ho_2g_2g_cnt_at>** - number of attempted INTRA GAS handovers **<cr_3g_3g_cnt_su>** - number of successful intra UMTS cell reselections **<cr_3g_3g_cnt_at>** - number of attempted intra UMTS cell reselections **<ir_cr_3g_2g_cnt_su>** - number of successful UMTS to GSM cell reselections **<ir_cr_3g_2g_cnt_at>** - number of attempted UMTS to GSM cell **<ir_hocc_3g_2g_cnt_su>** - number of successful UMTS to GSM HO or cell changes **<ir_hocc_3g_2g_cnt_at>** - number of attempted UMTS to GSM HO or cell changes **<ho_3g_3g_cnt_su>** - number of successful INTRA UAS handovers **<ho_3g_3g_cnt_su>** - number of attempted INTRA UAS handovers

#DBGS – Debug screen command	
	<ciphering> - ciphering dis-/enabled (0/1) (can only be changed via Phonetool) **<integr_prot>** - integrity protection dis-/enabled (0/1) (can only be changed via Phonetool)
AT#DBGS?	**#DBGS: <mode>,<page_nr>** where: **<mode>** - see before **<page_nr>** - see before
AT#DBGS=?	Test command returns all supported values of the parameter.

3.5.5.1.55. Display PIN Counter - #PCNT

#PCNT - Display PIN Counter	
AT#PCNT	Execution command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, depending on **+CPIN** requested password in the format: **#PCNT: <PIN attempts>, <PIN2 attempts>, <PUK attempts>, <PUK2 attempts>** where: **<PIN attempts>** - PIN1 remaining attempts **<PIN2 attempts>** - PIN2 remaining attempts **<PUK attempts>** - PUK1 remaining attempts **<PUK2 attempts>** - PUK2 remaining attempts 0 - the SIM is blocked. 1..3 - if the device is waiting either SIM PIN or SIM PIN2 to be given. 1..10 - if the device is waiting either SIM PUK or SIM PUK2 to be given.
AT#PCNT=?	Test command returns the OK result code.

3.5.5.1.56. Query SIM Status - #QSS

#QSS - Query SIM Status	
AT#QSS= <mode>	Set command enables/disables the Query SIM Status unsolicited indication in the ME. Parameter: **<mode>** - type of notification 0 - disabled (factory default); it's possible only to query the current SIM status through Read command **AT#QSS?** 1 - enabled; the ME informs at every SIM status change through the following unsolicited indication: **#QSS: <status>** where: **<status>** - current SIM status 0 - SIM NOT INSERTED

#QSS - Query SIM Status	
	1 - SIM INSERTED 2 - enabled; the ME informs at every SIM status change through the following unsolicited indication: **#QSS: <status>** where: **<status>** - current SIM status 0 - SIM NOT INSERTED 1 - SIM INSERTED 2 - SIM INSERTED and PIN UNLOCKED 3 - SIM INSERTED and READY (SMS and Phonebook access are possible).
AT#QSS?	Read command reports whether the unsolicited indication **#QSS** is currently enabled or not, along with the SIM status, in the format: **#QSS: <mode>,<status>** (**<mode>** and **<status>** are described above)
AT#QSS=?	Test command returns the supported range of values for parameter **<mode>**.
Example	AT#QSS? #QSS:0,1 OK

3.5.5.1.57. Read ICCID (Integrated Circuit Card Identification) - #CCID

#CCID - Read ICCID	
AT#CCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)
AT#CCID=?	Test command returns the **OK** result code.
Example	AT#CCID 89820507021001676 84F OK

3.5.5.1.58. Display SIM and Phonelock Status - +XSIMSTATE

+XSIMSTATE - Display SIM and Phonelock Status	
AT+XSIMSTATE= <mode>	This command enables or disables sending of the unsolicited result codes +XSIM and +XLOCK. The result codes are sent out whenever one of the states is changed or lock verification has been performed. Set Command enables or disables sending of the unsolicited result codes +XSIM and +XLOCK. Set Command:

+XSIMSTATE - Display SIM and Phonelock Status	
	AT+XSIMSTATE=1 **+XSIM: <SIM state><CR><LF>** **+XLOCK: […]<CR><LF>** **OK** **or** **CME ERROR: <error>** where: **<mode>** parameter sets the result code presentation in the TA: 0 disable 1 enable **<SIM state>** parameter shows the current SIM state and may be: 0 SIM not present 1 PIN verification needed 2 PIN verification not needed . Ready 3 PIN verified . Ready 4 PUK verification needed 5 SIM permanently blocked 6 SIM Error 7 ready for attach (+COPS) 8 SIM Technical Problem 9 SIM Removed **Note 1 :** The state 8 reflects a potentially temporary technical problem in access the SIM (return code 6F xx in SIM low level access) , action could either be to retry current operation or in case of SIM startup this may be a stable condition, then restarting the phone either automatically or manual should be considered. Because of the temporary meaning of this state, it does not get reflected by a following at+xsimstate? Command. Instead the previous state will get reported. **<fac>** facility values (see AT+CLCK): “PS” PH-SIM (lock Phone to SIM card) “PN” Network Personalisation (refer GSM 02.22 [33]) “PU” network sUbset Personalisation (refer GSM 02.22 [33]) “PP” service Provider Personalisation (refer GSM 02.22 [33]) “PC” Corporate Personalisation (refer GSM 02.22 [33]) **<Lock state>** parameter shows the state of the lock for <fac> 0 the lock is ARMED 1 the lock is ACTIVE 2 the lock is PERMANENT_ACTIVE

+XSIMSTATE - Display SIM and Phonelock Status	
	3 the lock is BLOCKED 4 the lock is DEACTIVE 5 the lock is DISABLED 6 the lock has just been AUTOACTIVATED **<Lock result>** parameter shows the result of the lock verification for <fac> 0 continue operation 1 verification needed 2 no further operation possible 3 lock error 4 unknown Note 2: +XSIM notifications are designed to give only the initial state of the SIM/SIM-PIN at the startup(based on SI_INFO_IND) or on restart. Update indications resulting +XSIM: 3 (or 4 or 5) is not given after SIM-PIN verification, AP shall rely on AT+CPIN responses for this. Apart from this, "+XSIM: 7" indication is given to indicate the completion of (U)SIMAP initializations (based on SI_INIT_IND).
AT+XSIMSTATE?	Read command returns the status of the mode selected. **+XSIMSTATE: <mode>**
AT+XSIMSTATE=?	Test command returns the list of supported<mode>s. **+XSIMSTATE: (0,1)**

3.5.5.1.59. SMS Ring Indicator - #E2SMSRI

#E2SMSRI - SMS Ring Indicator	
AT#E2SMSRI=[<n>]	Set command enables/disables the Ring Indicator pin response to an incoming SMS message. If enabled, a negative going pulse is generated on receipt of an incoming SMS message. The duration of this pulse is determined by the value of **<n>**. Parameter: **<n>** - **RI** enabling 0 - disables **RI** pin response for incoming SMS messages (factory default) 50..1150 - enables **RI** pin response for incoming SMS messages. The value of **<n>** is the duration in ms of the pulse generated on receipt of an incoming SM.
AT#E2SMSRI?	Read command reports the duration in ms of the pulse generated on receipt of an incoming SM, in the format: **#E2SMSRI: <n>** Note: as seen before, the value **<n>=0** means that the **RI** pin response to an incoming SM is disabled.

#E2SMSRI - SMS Ring Indicator	
AT#E2SMSRI=?	Reports the range of supported values for parameter **<n>**
Example	AT#E2SMSRI=50 OK

3.5.5.1.60. Message Waiting Indication - #MWI

#MWI - Message Waiting Indication	
AT#MWI=<enable>	Set command enables/disables the presentation of the **message waiting indicator** URC. Parameter: **<enable>** 0 - disable the presentation of the **#MWI** URC 1 - enable the presentation of the **#MWI** URC each time a new message waiting indicator is received from the network and, at startup, the presentation of the status of the **message waiting indicators**, as they are currently stored on SIM.. The URC format is: **#MWI: <status>,<indicator>[,<count>]** where: **<status>** 0 - clear: it has been deleted one of the messages related to the indicator **<indicator>**. 1 - set: there's a new waiting message related to the indicator **<indicator>** **<indicator>** 1 - either Line 1 (CPHS context) or Voice (3GPP context) 2 - Line 2 (CPHS context only) 3 - Fax 4 - E-mail 5 - Other **<count>** - message counter: network information reporting the number of pending messages related to the message waiting indicator **<indicator>**. The presentation at startup of the **message waiting indicators** status, as they are currently stored on SIM, is as follows: **#MWI: <status>[,<indicator>[,<count>][<CR><LF>** **#MWI: <status>,<indicator>[,<count>][...]]]** where: **<status>** 0 - no waiting message indicator is currently set: if this the case no other information is reported 1 - there are waiting messages related to the message waiting indicator **<indicator>**.

#MWI - Message Waiting Indication	
	<indicator> 1 - either Line 1 (CPHS context) or Voice (3GPP context) 2 - Line 2 (CPHS context) 3 - Fax 4 - E-mail 5 - Other **<count>** - message counter: number of pending messages related to the message waiting indicator **<indicator>** as it is stored on SIM.
AT#MWI?	Read command reports wheter the presentation of the **message waiting indicator** URC is currently enabled or not, and the current status of the **message waiting indicators** as they are currently stored on SIM. The format is: **#MWI: <enable>,<status>[,<indicator>[,<count>][<CR><LF>** **#MWI: <enable>,<status>,<indicator>[,<count>][...]]]**
AT#MWI=?	Test command returns the range of available values for parameter **<enable>**.

3.5.5.1.61. Set Voice Mail Number- +XSVM

+XSVM – Set Voice mail Number	
AT+XSVM=<line>,<index>,<mode>[,<number[,<type>]]	Set Command is used to set the number to the voice mail server. Parameter: **<line>** 1- line 1 2- line 2 **<index>** 1- home network voice mail number 2- roaming voice mail number **<mode>** 0- disable the voice mail number 1- enable the voice mail number **<number>** string type (0…9,+) containing the phone number **<type>**integer type indicating the type of address octet as follows: may be: 128-255 meaningful values: 129- ISDN / telephony numbering plan, national / international unknown 145- ISDN / telephony numbering plan, international number
AT+ XSVM?	Read command returns the currently selected voice mail number and the status. **+XSVM:** <line1>,<index1>,<mode1>,<number1>,<type1> <CR><LF>+XSVM: <line1>,<index2>,<mode2>,<number2>,<type2> <CR><LF>+XSVM: <line2>,<index1>,<mode3>,<number3>,<type3> <CR><LF>+XSVM: <line2>,<index2>,<mode4>,<number4>,<type4> OK

+XSVM – Set Voice mail Number	
AT+ XSVM=?	Test command returns supported <line>s, <index>s, <mode>s and <type>s. +XSVM: (list of supported <line>s),(list of supported <mode>s),<nlength>,(list of supported <type>s) OK
Example	AT+XSVM=1,1,0,"123456",129 OK AT+XSVM? +XSVM: 1,1,0,"123456",129,"MBDN voice number1" OK AT+XSVM=? +XSVM: (1),(0,1),(44),(128-255) OK

3.5.5.1.62. Status of External SMS Storage +XTESM

+XTESM – Status of External SMS Storage	
AT+XTESM=<mem_ capacity>	This command indicates the status of the external SMS storage. Parameter: **<mem_capacity>** 0- memory capacity free (default) 1- memory capacity full
AT+XTESM?	Read command reports the current value of the parameter **<mem_capacity>**.
AT+XTESM=?	Test command reports the supported value of **<mem_capacity>** parameter.

Enhanced Easy GPRS® Extension AT Commands

3.5.5.1.63. Authentication User ID - #USERID

#USERID - Authentication User ID	
AT#USERID= [<user>]	Set command sets the user identification string to be used during the authentication step. Parameter: **<user>** - string type, it's the authentication User Id; the max length for this value is the output of Test command, **AT#USERID=?** (factory default is the empty string "").
AT#USERID?	Read command reports the current user identification string, in the format: **#USERID: <user>**
AT#USERID=?	Test command returns the maximum allowed length of the string parameter **<user>**.
Example	AT#USERID="myName" OK AT#USERID?

#USERID - Authentication User ID	
	#USERID: "myName" OK

3.5.5.1.64. Authentication Password - #PASSW

#PASSW - Authentication Password	
AT#PASSW=[<pwd>]	Set command sets the user password string to be used during the authentication step. Parameter: **<pwd>** - string type, it's the authentication password; the max length for this value is the output of Test command, **AT#PASSW=?** (factory default is the empty string "").
AT#PASSW=?	Test command returns the maximum allowed length of the string parameter **<pwd>**.
Example	AT#PASSW="myPassword" OK

3.5.5.1.65. Packet Size - #PKTSZ

#PKTSZ - Packet Size	
AT#PKTSZ=[<size>]	Set command sets the default packet size to be used by the TCP/UDP/IP stack for data sending. Parameter: **<size>** - packet size in bytes 0 - automatically chosen by the device 1..1500 - packet size in bytes (factory default is 300)
AT#PKTSZ?	Read command reports the current packet size value. Note: after issuing command **AT#PKTSZ=0**, the Read command reports the value automatically chosen by the device.
AT#PKTSZ=?	Test command returns the allowed values for the parameter **<size>**.
Example	AT#PKTSZ=100 OK AT#PKTSZ? #PKTSZ: 100 OK AT#PKTSZ=0 OK AT#PKTSZ? #PKTSZ: 300

#PKTSZ - Packet Size	
	OK *->value automatically chosen by device*

3.5.5.1.66. Data Sending Time-Out - #DSTO

#DSTO -Data Sending Time-Out	
AT#DSTO=[<tout>]	Set command sets the maximum time that the module awaits before sending anyway a packet whose size is less than the default one. Parameter: **<tout>** - packet sending time-out in 100ms units (factory default is 50) 0 - no time-out, wait forever for packets to be completed before send. 1..255 hundreds of ms Note: In order to avoid low performance issues, it is suggested to set the data sending time-out to a value greater than 5. Note: this time-out applies to data whose size is less than packet size and whose sending would have been delayed for an undefined time until new data to be sent had been received and full packet size reached.
AT#DSTO?	Read command reports the current data sending time-out value.
AT#DSTO=?	Test command returns the allowed values for the parameter **<tout>**.
Example	AT#DSTO=10 *->1 sec. time-out* OK AT#DSTO? #DSTO: 10 OK

3.5.5.1.67. Socket Inactivity Time-Out - #SKTTO

#SKTTO - Socket Inactivity Time-Out	
AT#SKTTO=[<tout>]	Set command sets the maximum time with no data exchanging on the socket that the module awaits before closing the socket and deactivating the GPRS context. Parameter: **<tout>** - socket inactivity time-out in seconds units 0 - no time-out. 1..65535 - time-out in sec. units (factory default is 90). Note: this time-out applies when no data is exchanged in the socket for a long time and therefore the socket connection has to be automatically closed and the GPRS context deactivated(only for #SKTOP).
AT#SKTTO?	Read command reports the current socket inactivity time-out value.
AT#SKTTO=?	Test command returns the allowed values for parameter **<tout>**.

#SKTTO - Socket Inactivity Time-Out	
Example	AT#SKTTO=30 OK *->(30 sec. time-out)* AT#SKTTO? #SKTTO: 30 OK

3.5.5.1.68. Socket Definition - #SKTSET

#SKTSET - Socket Definition	
AT#SKTSET= [<socket type>, <remote port>, <remote addr>, [<closure type>], [<local port>]]	Set command sets the socket parameters values. Parameters: **<socket type>** - socket protocol type 0 - TCP (factory default) 1 - UDP **<remote port>** - remote host port to be opened 0..65535 - port number (factory default is 3333) **<remote addr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: xxx.xxx.xxx.xxx - any host name to be solved with a DNS query in the format: **<host name>** (factory default is the empty string “”) **<closure type>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) **<local port>** - local host port to be used on UDP socket 0..65535 - port number Note: **<closure type>** parameter is valid only for TCP socket type, for UDP sockets shall be left unused. Note: **<local port>** parameter is valid only for UDP socket type, for TCP sockets shall be left unused. Note: The resolution of the host name is done when opening the socket, therefore if an invalid host name is given to the **#SKTSET** command, then an error message will be issued. Note: the DNS Query to be successful requests that: - the GPRS context 1 is correctly set with **+CGDCONT** - the authentication parameters are set **(#USERID**, **#PASSW**) - the GPRS coverage is enough to permit a connection.
AT#SKTSET?	Read command reports the socket parameters values, in the format: **AT#SKTSET: <socket type>,<remote port>,<remote addr>, <closure type>,<local port>**

#SKTSET - Socket Definition	
AT#SKTSET=?	Test command returns the allowed values for the parameters.
Example	AT#SKTSET=0,1024,"123.255.020.001" OK AT#SKTSET=0,1024,"www.telit.net" OK
Note	Issuing command #QDNS will overwrite <remote addr> setting.

3.5.5.1.69. Socket Open - #SKTOP

#SKTOP - Socket Open	
AT#SKTOP	Execution command activates the context number 1, proceeds with the authentication with the user ID and password previously set by #USERID and #PASSW commands, and opens a socket connection with the host specified in the #SKTSET command. Eventually, before opening the socket connection, it issues automatically a DNS query to solve the IP address of the host name. If the connection succeeds a **CONNECT** indication is sent, otherwise a **ERROR** indication is sent.
AT#SKTOP=?	Test command returns the **OK** result code.
Example	AT#SKTOP *..GPRS context activation, authentication and socket open..* CONNECT
Note	This command is obsolete. It's suggested to use the couple #SGACT and #SO instead of it.

3.5.5.1.70. Query DNS - #QDNS

#QDNS - Query DNS	
AT#QDNS= [<host name>]	Execution command executes a DNS query to solve the host name into an IP address. Parameter: **<host name>** - host name, string type. If the DNS query is successful then the IP address will be reported in the result code: **#QDNS:"<host name>",<IP address>** Note: the command has to activate the GPRS context if it was not previously activated. In this case the context is deactivated after the DNS query. Note: **<IP address>** is in the format: **xxx.xxx.xxx.xxx**
AT#QDNS=?	Test command returns the **OK** result code.

#QDNS - Query DNS	
Note	This command requires that the authentication parameters are correctly set and that the GPRS network is present.

3.5.5.1.71. Manual DNS Selection - #DNS

#DNS – Manual DNS Selection	
AT#DNS=<cid>, <primary>, <secondary>	Set command allows to manually set primary and secondary DNS servers for a PDP context defined by **+CGDCONT** Parameters: **<cid>** - context identifier 1..5 - numeric parameter which specifies a particular PDP context definition **<primary>** - **manual primary DNS server**, string type, in the format **"xxx.xxx.xxx.xxx"** used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0") **<secondary>** - **manual secondary DNS server**, string type, in the format **"xxx.xxx.xxx.xxx"** used for the specified cid; we're using this value instead of the **secondary DNS server** come from the network (default is "0.0.0.0"). Note: if **<primary> is "0.0.0.0.0"** and **<secondary> is not "0.0.0.0"**, then issuing **AT#DNS=…** raises an error. Note: if **<primary> is "0.0.0.0.0"** we're using the **primary DNS server** come from the network as consequence of a context activation. Note: if **<primary> is not "0.0.0.0"** and **<secondary> is "0.0.0.0"**, then we're using only the **manual primary DNS server.** Note: the context identified by **<cid>** has to be previously defined, elsewhere issuing **AT#DNS=…** raises an error. Note: the context identified by **<cid>** has to be not activated yet, elsewhere issuing **AT#DNS=…** raises an error.
AT#DNS?	Read command returns the manual DNS servers set either for every defined PDP context and for the single GSM context (only if defined), in the format: **[#DNS: <cid>,<primary>,<secondary>[<CR><LF>** **#DNS: <cid>,<primary>,<secondary>]]**
AT#DNS=?	Test command reports the supported range of values for the **<cid>** parameter.only, in the format: **#DNS: (1-5),,**

3.5.5.1.72. Socket TCP Connection Time-Out - #SKTCT

#SKTCT - Socket TCP Connection Time-Out	
AT#SKTCT=[<tout>]	Set command sets the TCP connection time-out for the first **CONNECT** answer from the TCP peer to be received. Parameter: **<tout>** - TCP first **CONNECT** answer time-out in 100ms units 10..1200 - hundreds of ms (factory default value is 600). Note: this time-out applies only to the time that the TCP stack waits for the **CONNECT** answer to its connection request. Note: The time for activate the GPRS and resolving the name with the DNS query (if the peer was specified by name and not by address) is not counted in this time-out.
AT#SKTCT?	Read command reports the current TCP connection time-out.
AT#SKTCT=?	Test command returns the allowed values for parameter **<tout>**.
Example	AT#SKTCT=600 OK *socket first connection answer time-out has been set to 60 s.* *AT#SKTCT=* *OK* *If there is no time-out value, set by default(60s).*

3.5.5.1.73. Socket Parameters Save - #SKTSAV

#SKTSAV - Socket Parameters Save	
AT#SKTSAV	Execution command saves the actual socket parameters in the NVM of the device. The socket parameters to store are: - User ID - Password - Packet Size - Socket Inactivity Time-Out - Data Sending Time-Out - Socket Type (UDP/TCP) - Remote Port - Remote Address - TCP Connection Time-Out
AT#SKTSAV=?	Test command returns the **OK** result code.
Example	AT#SKTSAV OK *socket parameters have been saved in NVM*
Note	If some parameters have not been previously specified then a default value will be stored.

3.5.5.1.74. Socket Parameters Reset - #SKTRST

#SKTRST - Socket Parameters Reset	
AT#SKTRST	Execution command resets the actual socket parameters in the NVM of the device to the default ones. The socket parameters to reset are: - User ID - Password - Packet Size - Socket Inactivity Time-Out - Data Sending Time-Out - Socket Type - Remote Port - Remote Address - TCP Connection Time-Out
AT#SKTRST=?	Test command returns the **OK** result code.
Example	AT#SKTRST OK *socket parameters have been reset*

3.5.5.1.75. GPRS Context Activation - #GPRS

#GPRS - GPRS Context Activation	
AT#GPRS=[<mode>]	Execution command deactivates/activates the GPRS context, eventually proceeding with the authentication with the parameters given with #PASSW and #USERID. Parameter: **<mode>** - GPRS context activation mode 0 - GPRS context deactivation request 1 - GPRS context activation request In the case that the GPRS context has been activated, the result code **OK** is preceded by the intermediate result code: **+IP: <ip_address_obtained>** reporting the local IP address obtained from the network.
AT#GPRS?	Read command reports the current status of the GPRS context, in the format: **#GPRS: <status>** where: **<status>** 0 - GPRS context deactivated 1 - GPRS context activated 2 - GPRS context activation pending.
AT#GPRS=?	Test command returns the allowed values for parameter **<mode>**.

#GPRS - GPRS Context Activation	
Example	AT#GPRS=1 +IP: 129.137.1.1 OK *Now GPRS Context has been activated and our IP is 129.137.1.1* AT#GPRS=0 OK *Now GPRS context has been deactivated, IP is lost.*

3.5.5.1.76. Socket Dial - #SKTD

#SKTD - Socket Dial	
AT#SKTD= [<socket type>, <remote port>, <remote addr>, [<closure type>], [<local port>]]	Set command opens the socket towards the peer specified in the parameters. Parameters: **<socket type>** - socket protocol type 0 - TCP (factory default) 1 - UDP **<remote port>** - remote host port to be opened 0..65535 - port number (factory default is 0) **<remote addr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: xxx.xxx.xxx.xxx - any host name to be solved with a DNS query in the format: **<host name>** (factory default is the empty string “”) **<closure type>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) **<local port>** - local host port to be used on UDP socket 0..65535 - port number Note: **<closure type>** parameter is valid only for TCP socket type, for UDP sockets shall be left unused. Note: **<local port>** parameter is valid only for UDP socket type, for TCP sockets shall be left unused. Note: the resolution of the host name is done when opening the socket, therefore if an invalid host name is given to the **#SKTD** command, then an error message will be issued. Note: the command to be successful requests that: - the GPRS context 1 is correctly set with +CGDCONT - the authentication parameters are set **(**#USERID, #PASSW) the GPRS coverage is enough to permit a connection - the GPRS has been activated with **AT#GPRS=1**

#SKTD - Socket Dial	
	Note: If all parameters are omitted then the behaviour of Set command is the same as Read command.
AT#SKTD?	Read command reports the socket dial parameters values, in the format: **AT#SKTD: <socket type>,<remote port>,<remote addr>,** **<closure type>,<local port>**
AT#SKTD=?	Test command returns the allowed values for the parameters.
Example	AT#SKTD=0,1024,"123.255.020.001",255 CONNECT AT#SKTD=1,1024,"123.255.020.001", ,1025 CONNECT *In this way my local port 1025 is opened to the remote port 1024* AT#SKTD=0,1024,"www.telit.net", 255 CONNECT
Note	The main difference between this command and #SKTOP is that this command does not interact with the GPRS context status, leaving it **ON** or **OFF** according to the #GPRS setting, therefore when the connection made with **#SKTD** is closed the context (and hence the local IP address) is maintained.

3.5.5.1.77. Socket Listen - #SKTL

#SKTL - Socket Listen	
AT#SKTL **=[<mode>,** **<socket type>,** **<input port>,** **[<closure type>]]**	Execution command opens/closes the socket listening for connection requests. Parameters: **<mode>** - socket mode 0 - closes socket listening 1 - starts socket listening **<socket type>** - socket protocol type 0 - TCP **<input port>** - local host input port to be listened 0..65535 - port number **<closure type>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) Command returns the **OK** result code if successful. Note: the command to be successful requests that: - the GPRS context 1 is correctly set with +CGDCONT - the authentication parameters are set (#USERID, #PASSW) - the GPRS coverage is enough to permit a connection - the GPRS has been activated with **AT#GPRS=1**

#SKTL - Socket Listen	
	When a connection request comes on the input port, if the sender is not filtered by the internal firewall (see command #FRWL), an unsolicited code is reported: **+CONN FROM: <remote addr>** Where: **<remote addr>** - host address of the remote machine that contacted the device. When the connection is established the **CONNECT** indication is given and the modem goes into data transfer mode. On connection close or when context is closed with **#GPRS=0** the socket is closed and no listen is anymore active. If the context is closed by the network while in listening, the socket is closed, no listen is anymore active and an unsolicited code is reported: **#SKTL: ABORTED**
AT#SKTL?	Read command returns the current socket listening **status** and the last settings of parameters **<socket type>**,**<input port>** and **<closure type>**, in the format: **#SKTL: <status>,<socket type>**,**<input port>,<closure type>** Where **<status>** - socket listening status 0 - socket not listening 1 - socket listening If the socket is closed, all parameters are set to 0.
AT#SKTL=?	Test command returns the allowed values for parameters **<mode>**, **<socket type>**, **<input port>** and **<closure type>**.
Example	*Activate GPRS* AT#GPRS=1 +IP: ###.###.###.### OK *Start listening* AT#SKTL=1,0,1024 OK or AT#SKTL=1,0,1024,255 OK *Receive connection requests* +CONN FROM: 192.164.2.1 CONNECT *exchange data with the remote host*

#SKTL - Socket Listen	
	send escape sequence +++ NO CARRIER *Now listen is not anymore active* *to stop listening* AT#SKTL=0,0,1024, 255 OK
Note	The main difference between this command and **#SKTD** is that **#SKTL** does not contact any peer, nor does any interaction with the GPRS context status, leaving it **ON** or **OFF** according to the **#GPRS** setting, therefore when the connection made with **#SKTL** is closed the context (and hence the local IP address) is maintained.

3.5.5.1.78. Socket Listen Ring Indicator - #E2SLRI

#E2SLRI - Socket Listen Ring Indicator	
AT#E2SLRI=[<n>]	Set command enables/disables the Ring Indicator pin response to a Socket Listen connect and, if enabled, the duration of the negative going pulse generated on receipt of connect. Parameter: **<n>** - **RI** enabling 0 - **RI** disabled for Socket Listen connect (factory default) 50..1150 - **RI** enabled for Socket Listen connect; a negative going pulse is generated on receipt of connect and **<n>** is the duration in ms of this pulse.
AT#E2SLRI?	Read command reports whether the Ring Indicator pin response to a Socket Listen connect is currently enabled or not, in the format: **#E2SLRI: <n>**
AT#E2SLRI=?	Test command returns the allowed values for parameter **<status>.**

3.5.5.1.79. Firewall Setup - #FRWL

#FRWL - Firewall Setup	
AT#FRWL= **[<action>,** **<ip_address>,** **<net mask>]**	Execution command controls the internal firewall settings. Parameters: **<action>** - command action 0 - remove selected chain 1 - add an **ACCEPT** chain 2 - remove all chains (**DROP** everything); **<ip_addr>** and **<net_mask>** has no meaning in this case. **<ip_addr>** - remote address to be added into the **ACCEPT** chain; string type, it can be any valid IP address in the format: xxx.xxx.xxx.xxx **<net_mask>** - mask to be applied on the **<ip_addr>**; string type, it can be any valid

#FRWL - Firewall Setup	
	IP address mask in the format: xxx.xxx.xxx.xxx Command returns **OK** result code if successful. Note: the firewall applies for incoming (listening) connections only. Firewall general policy is **DROP**, therefore all packets that are not included into an **ACCEPT** chain rule will be silently discarded. When a packet comes from the IP address **incoming_IP**, the firewall chain rules will be scanned for matching with the following criteria: **incoming_IP & <net_mask> = <ip_addr> & <net_mask>** If criteria is matched, then the packet is accepted and the rule scan is finished; if criteria is not matched for any chain the packet is silently dropped.
AT#FRWL?	Read command reports the list of all **ACCEPT** chain rules registered in the Firewall settings in the format: **#FRWL: <ip_addr>,<net_mask>** **#FRWL: <ip_addr>,<net_mask>** **….** **OK**
AT#FRWL=?	Test command returns the allowed values for parameter **<action>.**
Example	*Let assume we want to accept connections only from our devices which are on the IP addresses ranging from* *197.158.1.1 to 197.158.255.255* *We need to add the following chain to the firewall:* AT#FRWL=1,"197.158.1.1","255.255.0.0" OK
Note	For outgoing connections made with #SKTOP and #SKTD the remote host is dynamically inserted into the **ACCEPT** chain for all the connection duration. Therefore the **#FRWL** command shall be used only for defining the **#SKTL** behaviour, deciding which hosts are allowed to connect to the local device. Rules are not saved in NVM, at startup the rules list will be empty.

3.5.5.1.80. Maximum TCP Payload Size - #TCPMAXDAT

#TCPMAXDAT – Maximum TCP Payload Size

#TCPMAXDAT – Maximum TCP Payload Size	
AT#TCPMAXDAT=<size>	Set command allows to set the maximum TCP payload size in TCP header options. Parameter: **<size>** - maximum TCP payload size accepted in one single TCP/IP datagram; it is sent in TCP header options in SYN packet. 0 - the maximum TCP payload size is automatically handled by module (default). 496..1420 - maximum TCP payload size
AT#TCPMAXDAT?	Read command reports the current maximum TCP payload size, in the format: **#TCPMAXDAT: <size>**
AT#TCPMAXDAT=?	Test command reports the supported range of values for parameter **<size>**

3.5.5.2. Multisocket AT Commands

3.5.5.2.1. Socket Status - #SS

#SS - Socket Status	
AT#SS[=<connId>]	Execution command reports the current status of the sockets in the format: **#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>** **[<CR><LF><connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>** **[…]]** where: **<connId>** - socket connection identifier 1..6 **<state>** - actual state of the socket: 0 - Socket Closed. 1 - Socket with an active data transfer connection. 2 - Socket suspended. 3 - Socket suspended with pending data. 4 - Socket listening. 5 - Socket with an incoming connection. Waiting for the user accept or shutdown command. **<locIP>** - IP address associated by the context activation to the socket. **<locPort>** - two meanings: - the listening port if we put the socket in listen mode. - the local port for the connection if we use the socket to connect to a remote machine. **<remIP>** - when we are connected to a remote machine this is the remote IP address. **<remPort>** - it is the port we are connected to on the remote machine.
AT#SS=?	Test command returns the **OK** result code.

3.5.5.2.2. Socket Info - #SI

#SI - Socket Info	
AT#SI[=<connId>]	Execution command is used to get information about socket data traffic. Parameters: **<connId>** - socket connection identifier 1..6 The response format is: **#SI: <connId>,<sent>,<received>,<buff_in>,<ack_waiting>** where:

#SI - Socket Info	
	<connId> - socket connection identifier, as before **<sent>** - total amount (in bytes) of sent data since the last time the socket connection identified by **<connId>** has been opened **<received>** - total amount (in bytes) of received data since the last time the socket connection identified by **<connId>** has been opened **<buff_in>** - total amount (in bytes) of data just arrived through the socket connection identified by **<connId>** and currently buffered, not yet read **<ack_waiting>** - total amount (in bytes) of sent and not yet acknowledged data since the last time the socket connection identified by **<connId>** has been opened Note: not yet acknowledged data are available only for TCP connections; the value **<ack_waiting>** is always 0 for UDP connections. Note: issuing **#SI<CR>** causes getting information about data traffic of all the sockets; the response format is: **#SI: <connId1>,<sent1>,<received1>,<buff_in1>,<ack_waiting1>** **<CR><LF>** **…** **#SI: <connId6>,<sent6>,<received6>,<buff_in6>,<ack_waiting6>**
AT#SI=?	Test command reports the range for parameter **<connId>**.
Example	AT#SI #SI: 1,123,400,10,50 #SI: 2,0,100,0,0 #SI: 3,589,100,10,100 #SI: 4,0,0,0,0 #SI: 5,0,0,0,0 #SI: 6,0,98,60,0 OK *Sockets 1,2,3,6 are opened with some data traffic.* *For example socket 1 has 123 bytes sent, 400 bytes received,10 byte waiting to be read and 50 bytes waiting to be acknowledged from the remote side.* AT#SI=1 #SI: 1,123,400,10,50 OK *We have information only about socket number 1*

3.5.5.2.3. Context Activation - #SGACT

#SGACT - Context Activation	
AT#SGACT=<cid>,	Execution command is used to activate or deactivate the specified PDP context.

#SGACT - Context Activation	
<stat>[,<userId>[, <pwd>]]	Parameters: **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition **<stat>** 0 - deactivate the context 1 - activate the context **<userId>** - string type, used only if the context requires it **<pwd>** - string type, used only if the context requires it Note: context activation/deactivation returns ERROR if there is not any socket associated to it (see AT#SCFG).
AT#SGACT?	Returns the state of all the five contexts, in the format: **#SGACT: <cid1>,<Stat1><CR><LF>** **…** **#SGACT: <cid5>,<Stat5>** where: **<cid*n*>** - as **<cid>** before **<stat*n*>** - context status 0 - context deactivated 1 - context activated
AT#SGACT=?	Reports the range for the parameters **<cid>** and **<stat>**
Note	It is strongly recommended to use the same command (e.g. #SGACT) to activate the context, deactive it and interrogate about its status.

3.5.5.2.4. Socket Shutdown - #SH

#SH - Socket Shutdown	
AT#SH=<connId>	This command is used to close a socket. Parameter: **<connId>** - socket connection identifier 1..6 Note: a socket connection can be closed only when it is in suspended mode (with pending data too). Trying to close an active socket connection will produce an error.
AT#SH=?	Test command reports the range for parameter **<connId>**.

3.5.5.2.5. Socket Configuration - #SCFG

#SCFG - Socket Configuration	
AT#SCFG=	Set command sets the socket configuration parameters.

#SCFG - Socket Configuration	
<connId>,<cid>, <pktSz>,<maxTo>, <connTo>,<txTo>	Parameters: **<connId>** - socket connection identifier 1..6 **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition **<pktSz>** - packet size to be used by the TCP/UDP/IP stack for data sending. 0 – select automatically default value 1..1500 - packet size in bytes. **<maxTo>** - exchange timeout(or socket inactivity time); if there's no data exchange within this timeout period the connection is closed 0 - no timeout 1...65535 - timeout value in seconds (default 90 s.) **<connTo>** - connection timeout; if we can't establish a connection to the remote within this timeout period, an error is raised. 10..1200 - timeout value in hundreds of milliseconds (default 600) **<txTo>** - data sending timeout; data are sent even if they're less than max packet size , after this period. 0 - no timeout 1..255 - timeout value in hundreds of milliseconds (default 50) Note: these values are automatically saved in NVM.
AT#SCFG?	Read command returns the current socket configuration parameters values for all the six sockets, in the format: **#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1>** **<CR><LF>** **. . .** **#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>** **<CR><LF>**
AT#SCFG=?	Test command returns the range of supported values for all the subparameters.
Example	at#scfg? #SCFG: 1,1,300,90,600,50 #SCFG: 2,2,300,90,600,50 #SCFG: 3,2,250,90,600,50 #SCFG: 4,1,300,90,600,50 #SCFG: 5,1,300,90,600,50 #SCFG: 6,1,300,90,600,50 OK

3.5.5.2.6. Socket Configuration Extended - #SCFGEXT

#SCFGEXT - Socket Configuration Extended

#SCFGEXT - Socket Configuration Extended	
AT#SCFGEXT= <connId>, <srMode>, <dataMode>, <keepalive> [,<unused_A> [,<sendDataMode>]]	Set command sets the socket configuration extended parameters. Parameters: **<connId>** - socket connection identifier 1..6 **<srMode>** - **SRing** URC mode 0 - normal mode (default): **SRING : <connId>** where: **<connId>** - socket connection identifier, as before 1 - data amount mode: **SRING : <connId>,<recData>** where: **<connId>** - as before **<recData>** - amount of data received on the socket connection 2 - data view mode: **SRING : <connId>,<recData>,<data>** where: **<connId>** - **<recData>** - as before **<data>** - received data; the presentation format depens on the subparameter **<dataMode>** value **<dataMode>** - "data view mode" presentation format 0 - data represented as text (default) 1 - data represented as sequence of hexadecimal numbers (from 00 to FF) **<keepalive>** - **TCP keepalive** timer timeout 0 - **TCP keepalive** timer is deactivated (default) 1..240 - **TCP keepalive** timer timeout in minutes **<unused_A>** - currently not used 0 - reserved for future use **<sendDataMode>** - data mode for sending data in command mode(AT#SSEND or AT#SSENDEXT) 0 - data represented as text (default) 1 - data represented as sequence of hexadecimal numbers (from 00 to FF) Each octet of the data is given as two IRA character long hexadecimal number Note: <**keepalive**> has effect only on TCP connections. Note: these values are automatically saved in NVM
AT#SCFGEXT?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT: <connId1>,<srMode1>,<dataMode1>,<keepalive1>, <unused_A1>,< sendDataMode1><CR><LF>** **...** **#SCFGEXT: <connId6>,<srMode6>,<dataMode6>,<keepalive6>** **<unused_A6>,< sendDataMode6 >**
AT#SCFGEXT=?	Test command returns the range of supported values for all the subparameters

#SCFGEXT - Socket Configuration Extended	
Example	Socket 1 set with data view sring, text data mode and a keepalive time of 30 minutes. Socket 3 set with data amount sring, hex data mode and no keepalive. Socket 4 set with hex recv and send data mode at#scfgext? #SCFGEXT: 1,2,0,30,0,0 #SCFGEXT: 2,0,0,0,0,0 #SCFGEXT: 3,1,1,0,0,0 #SCFGEXT: 4,0,1,0,0,1 #SCFGEXT: 5,0,0,0,0,0 #SCFGEXT: 6,0,0,0,0,0 OK

3.5.5.2.7. Socket Dial - #SD

#SD - Socket Dial	
AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>[,<closureType>[,<lPort>[,<connMode>]]]	Execution command opens a remote connection via socket. Parameters: **<connId>** - socket connection identifier 1..6 **<txProt>** - transmission protocol 0 - TCP 1 - UDP **<rPort>** - remote host port to contact 0..65535 **<IPaddr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: “xxx.xxx.xxx.xxx” - any host name to be solved with a DNS query **<closureType>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) **<lPort>** - UDP connections local port 0..65535 **<connMode>** - Connection mode 0 - online mode connection (default) 1 - command mode connection Note: **<closureType>** parameter is valid for TCP connections only and has no effect (if used) for UDP connections. Note: **<lPort>** parameter is valid for UDP connections only and has no

#SD - Socket Dial	
	effect (if used) for TCP connections. Note: if we set **<connMode>** to **online mode connection** and the command is successful we enter in **online data mode** and we see the intermediate result code **CONNECT**. After the **CONNECT** we can suspend the direct interface to the socket connection (nb the socket stays open) using the escape sequence (**+++**): the module moves back to **command mode** and we receive the final result code **OK** after the suspension. After such a suspension, it's possible to resume it in every moment (unless the socket inactivity timer timeouts, see **#SCFG**) by using the **#SO** command with the corresponding **<connId>**. Note: if we set **<connMode>** to **command mode connection** and the command is successful, the socket is opened and we remain in **command mode** and we see the result code **OK**. Note: if there are input data arrived through a connected socket and not yet read because the module entered **command mode** before reading them (after an escape sequence or after **#SD** has been issued with **<connMode>** set to **command mode connection)**, these data are buffered and we receive the **SRING** URC (**SRING** presentation format depends on the last **#SCFGEXT** setting); it's possible to read these data afterwards issuing **#SRECV**. Under the same hypotheses it's possible to send data while in **command mode** issuing **#SSEND**
AT#SD=?	Test command reports the range of values for all the parameters.
Example	*Open socket 1 in online mode* AT#SD=1,0,80,"www.google.com",0,0,0 CONNECT … *Open socket 1 in command mode* AT#SD=1,0,80,"www.google.com",0,0,1 OK

3.5.5.2.8. Socket Accept - #SA

#SA - Socket Accept	
AT#SA=<connId> [,<connMode>]	Execution command accepts an incoming socket connection after an URC **SRING: <connId>** Parameter: **<connId>** - socket connection identifier 1..6 **<connMode>** - Connection mode, as for command **#SD**. 0 - online mode connection (default) 1 - command mode connection

#SA - Socket Accept	
	Note: the **SRING** URC has to be a consequence of a **#SL** issue
AT#SA=?	Test command reports the range of values for all the parameters.

3.5.5.2.9. Socket Restore - #SO

#SO - Socket Restore	
AT#SO=<connId>	Execution command resumes socket connection which has been suspended by the escape sequence. Parameter: **<connId>** - socket connection identifier 1..6
AT#SO=?	Test command reports the range of values for **<connId>** parameter.

3.5.5.2.10. Socket Listen - #SL

#SL - Socket Listen	
AT#SL=<connId>, <listenState>, <listenPort> [,<lingerT>]	This command opens/closes a socket listening for an incoming connection on a specified port. Parameters: **<connId>** - socket connection identifier 1..6 **<listenState>** - 0 - closes socket listening 1 - starts socket listening **<listenPort>** - local listening port 0..65535 **<lingerT>** - linger time 0 - immediate closure after remote closure 255 - local host closes only after an escape sequence (+++) Note: if successful, commands returns a final result code **OK** . Then, when there's an incoming connection on the local port and if the sender is not filtered by internal firewall (see **#FRWL**), an URC is received: **SRING : <connId>** Note: the command **#SCFGEXT** doesn't influence the presentation format of the URC **SRING** Afterwards we can use **#SA** to accept the connection or **#SH** to refuse it.

#SL - Socket Listen	
	If the socket is closed by the network the following URC is received: **#SKTL: ABORTED**
AT#SL?	Read command returns all the actual listening sockets.
AT#SL=?	Test command returns the range of supported values for all the subparameters.
Example	at#scfg? #SCFG: 1,1,300,90,600,50 #SCFG: 2,2,300,90,600,50 #SCFG: 3,2,250,90,600,50 #SCFG: 4,1,300,90,600,50 #SCFG: 5,1,300,90,600,50 #SCFG: 6,1,300,90,600,50 OK

3.5.5.2.11. *Receive* Data In Command Mode - #SRECV

#SRECV – Received Data in Command Mode	
AT#SRECV= <connId>, <maxByte>	Execution command permits the user to read data arrived through a connected socket, but buffered and not yet read because the module entered **command mode** before reading them; the module is notified of these data by a **SRING** URC, whose presentation format depends on the last **#SCFGEXT** setting. Parameters: **<connId>** - socket connection identifier 1..6 **<maxByte>** - max number of bytes to read 1..1500 Note: issuing **#SRECV** when there's no buffered data raises an error.
Example	*SRING URC (<srMode> be 0, <dataMode> be 0) telling data have just come through connected socket identified by <connId>=1 and are now buffered* SRING: 1 *Read in text format the buffered data* AT#SRECV=1,15 #SRECV: 1,15 stringa di test OK *SRING URC (<srMode> be 1, <dataMode> be 1) telling 15 bytes data have just come through connected socket identified by <connId>=2 and are now buffered* SRING: 2,15 *Read in hexadecimal format the buffered data* AT#SRECV=2,15 #SRECV: 2,15 737472696e6761206469207465737374

#SRECV – Received Data in Command Mode	
	OK *SRING URC (<srMode> be 2, <dataMode> be 0) displaying (in text format) 15 bytes data that have just come through connected socket identified by <connId>=3; it's no necessary to issue #SRECV to read the data; no data remain in the buffer after this URC* SRING: 3,15, stringa di test

3.5.5.2.12. Send Data In Command Mode - #SSEND

#SSEND – Send Data in Command Mode	
AT#SSEND= <connId>	Execution command permits, while the module is in **command mode,** to send data through a connected socket. Parameters: **<connId>** - socket connection identifier 1..6 The device responds to the command with the prompt '>' and waits for the data to send. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported Note: the maximum number of bytes to send is 1500; trying to send more data will cause **ERROR** and discarded input data. And then it is possible to input new data. Note: it's possible to use **#SSEND** only if the connection was opened by **#SD**, else the ME is raising an error Note: a byte corresponding to BS char(0x08) is treated with its corresponding meaning; therefore previous byte will be cancelled(and BS char itself will not be sent)
Example	*Send data through socket number 2* AT#SSEND=2 >Test<CTRL-Z> OK

3.5.5.2.13. Send data in Command Mode extended - #SSENDEXT

#SSEND EXT– Send Data in Command Mode extended

#SSEND EXT– Send Data in Command Mode extended	
AT#SSENDEXT= <connId>, <bytestosend>	Execution command permits, while the module is in command mode, to send data through a connected socket including all possible octets(from 0x00 to 0xFF) Parameters: **<connId>** - socket connection identifier 1..6 **<bytestosend>** - number of bytes to be sent Please refer to test command for range The device responds to the command with the prompt '->' <greater_than><space> and waits for the data to send. When <bytestosend> bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: it's possible to use #SSENDEXT only if the connection was opened by #SD, else the ME is raising an error. Note: all special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and don't behave like a BS, i.e. previous character is not deleted)
AT#SSENDEXT=?	Test command returns the range of supported values for parameters <connId> and <bytestosend>

Example	Open the socket in command mode:
	
	AT#SD=1,0,<port>,"IP address",0,0,1
	OK
	
	Give the command specifying total number of bytes as second parameter:
	
	AT#SSENDEXT=1,256
	>……; // Terminal echo of bytes sent is displayed here
	OK
	
	All possible bytes(from 0x00 to 0xFF) are sent on the socket as generic bytes.

3.5.5.2.14. Socket Listen UDP - #SLUDP

#SLUDP - Socket Listen UDP	
AT#SLUDP=<connId>, <listenState>, <listenPort>	This command opens/closes a socket listening for an incoming UDP connection on a specified port. Parameters: **<connId>** - socket connection identifier 1..6 **<listenState>** - 0 - closes socket listening

#SLUDP - Socket Listen UDP	
	1 - starts socket listening **<listenPort>** - local listening port 1..65535 Note: if successful, commands returns a final result code **OK** . Then, when there's an incoming UDP connection on the local port and if the sender is not filtered by internal firewall (see **#FRWL**), an URC is received: **SRING : <connId>** Afterwards we can use **#SA** to accept the connection or **#SH** to refuse it. If the socket is closed by the network the following URC is received: **#SLUDP: ABORTED**
AT#SLUDP?	Read command returns all the actual listening sockets.
AT#SLUDP=?	Test command returns the range of supported values for all the subparameters.
Example	Next command opens a socket listening for UDP on port 3500. AT#SLUDP=1,1,3500 OK

3.5.5.3. FTP AT Commands

3.5.5.3.1. FTP Time Out - #FTPTO

#FTPTO - FTP Time-Out	
AT#FTPTO=[<tout>]	Set command sets the time-out used when opening either the FTP control channel or the FTP traffic channel. Parameter: **<tout>** - time-out in 100 ms units 100..5000 - hundreds of ms (factory default is 100) Note: The parameter is not saved in NVM.
AT#FTPTO?	Read command returns the current FTP operations time-out, in the format: **#FTPTO: <tout>**
AT#FTPTO=?	Test command returns the range of supported values for parameter **<tout>**

3.5.5.3.2. FTP Open - #FTPOPEN

#FTPOPEN - FTP Open

#FTPOPEN - FTP Open	
AT#FTPOPEN= **[<server:port>,** **<username>,** **<password>,** **<mode>]**	Execution command opens an FTP connection toward the FTP server. Parameters: **<server:port>** - string type, address and port of FTP server (factory default port 21). **<username>** - string type, authentication user identification string for FTP. **<password>** - string type, authentication password for FTP. **<mode>** 0 - active mode (factory default) 1 - passive mode Note: Before opening FTP connection the GPRS must been activated with **AT#GPRS=1**
AT#FTPOPEN=?	Test command returns the **OK** result code.

3.5.5.3.3. FTP Close - #FTPCLOSE

#FTPCLOSE - FTP Close	
AT#FTPCLOSE	Execution command closes an FTP connection.
AT#FTPCLOSE=?	Test command returns the **OK** result code.

3.5.5.3.4. FTP Put - #FTPPUT

#FTPPUT - FTP Put	
AT#FTPPUT= **[<filename>]**	Execution command, issued during an FTP connection, opens a data connection and starts sending **<filename>** file to the FTP server. If the data connection succeeds, a **CONNECT** indication is sent, otherwise a **NO CARRIER** indication is sent. Parameter: **<filename>** - string type, name of the file. Note: use the escape sequence +++ to close the data connection. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet. Note: If the filename is missing cause an ERROR result code to be returned
AT#FTPPUT=?	Test command returns the **OK** result code.

3.5.5.3.5. FTP Get - #FTPGET

#FTPGET - FTP Get	
AT#FTPGET=	Execution command, issued during an FTP connection, opens a data connection and

#FTPGET - FTP Get	
[<filename>]	starts getting a file from the FTP server. If the data connection succeeds a **CONNECT** indication is sent, otherwise a **NO CARRIER** indication is sent. The file is received on the serial port. Parameter: **<filename>** - file name, string type. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
AT#FTPGET=?	Test command returns the OK result code.

3.5.5.3.6. FTP Type - #FTPTYPE

#FTPTYPE - FTP Type	
AT#FTPTYPE=[<type>]	Set command, issued during an FTP connection, sets the file transfer type. Parameter: **<type>** - file transfer type: 0 - binary 1 - ascii Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet. Note: If the type parameter is missing cause an ERROR result code to be returned.
#FTPTYPE?	Read command returns the current file transfer type, in the format: **#FTPTYPE: <type>**
#FTPTYPE=?	Test command returns the range of available values for parameter **<type>**: **#FTPTYPE: (0,1)**

3.5.5.3.7. FTP Read Message - #FTPMSG

#FTPMSG - FTP Read Message	
AT#FTPMSG	Execution command returns the last response from the server.
AT#FTPMSG=?	Test command returns the **OK** result code.

3.5.5.3.8. FTP Delete - #FTPDELE

#FTPDELE - FTP Delete	
AT#FTPDELE=[<filename>]	Execution command, issued during an FTP connection, deletes a file from the remote working directory. Parameter: **<filename>** - string type, it's the name of the file to delete.

#FTPDELE - FTP Delete	
	Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
AT#FTPDELE=?	Test command returns the **OK** result code.

3.5.5.3.9. FTP Print Working Directory - #FTPPWD

#FTPPWD - FTP Print Working Directory	
AT#FTPPWD	Execution command, issued during an FTP connection, shows the current working directory on FTP server. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
AT#FTPPWD=?	Test command returns the **OK** result code.

3.5.5.3.10. FTP Change Working Directory - #FTPCWD

#FTPCWD - FTP Change Working Directory	
AT#FTPCWD=[<dirname>]	Execution command, issued during an FTP connection, changes the working directory on FTP server. Parameter: **<dirname>** - string type, it's the name of the new working directory. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
AT#FTPCWD=?	Test command returns the **OK** result code.

3.5.5.3.11. FTP List - #FTPLIST

#FTPLIST - FTP List	
AT#FTPLIST[=[<name>]]	Execution command, issued during an FTP connection, opens a data connection and starts getting from the server the list of contents of the specified directory or the properties of the specified file. Parameter: **<name>** - string type, it's the name of the directory or file. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet. Note: issuing **AT#FTPLIST<CR>** opens a data connection and starts getting from the server the list of contents of the working directory.
AT#FTPLIST=?	Test command returns the **OK** result code.

3.5.5.4. GPS AT Commands Set

3.5.5.4.1. GPS Controller Power Management - $GPSP

$GPSP - GPS Controller Power Management	
AT$GPSP=<status>	Set command allows to manage power-up or down of the GPS controller Parameter: **<status>** 0 - GPS controller is powered down(default) 1 - GPS controller is powered up Note: the current setting is stored through **$GPSSAV**
AT$GPSP?	Read command reports the current value of the **<status>** parameter, in the format: **$GPSP: <status>**
AT$GPSP=?	Test command reports the range of supported values for parameter **<status>**
Example	AT$GPSP=0 OK

3.5.5.4.2. GPS Reset - $GPSR

$GPSR - GPS Reset	
AT$GPSR= <reset_type>	Execution command allows to reset the GPS controller. Parameter: **<reset_type>** 0 - Hardware reset: the GPS receiver is reset and restarts by using the values stored in the internal memory of the GPS receiver. 1 - Coldstart (No Almanac, No Ephemeris): this option clears all data that is currently stored in the internal memory of the GPS receiver including position, almanac, ephemeris, and time. The stored clock drift however, is retained. It is available in controlled mode only. 2 - Warmstart (No ephemeris): this option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The almanac is retained but the ephemeris is cleared. It is available in controlled mode only. 3 - Hotstart (with stored Almanac and Ephemeris): the GPS receiver restarts by using the values stored in the internal memory of the GPS receiver; validated ephemeris and almanac. It is available in controlled mode only.
AT$GPSR=?	Test command reports the range of supported values for parameter **<reset_type>**
Example	AT$GPSR=0 OK

3.5.5.4.3. GPS Antenna Type Definition - $GPSAT

$GPSAT - GPS Antenna Type Definition	
AT$GPSAT=<type>	Set command selects the GPS antenna used. Parameter: **<type>** 0 - GPS Antenna not power supplied by the module 1 - GPS Antenna power supplied by the module (default) Note: the current setting is stored through **$GPSSAV**
AT$GPSAT?	Read command returns the currently used antenna, in the format:

3.5.5.4.4. Save GPS Parameters Configuration - $GPSSAV

$GPSSAV - Save GPS Parameters Configuration	
AT$GPSSAV	Execution command stores the current GPS parameters in the NVM of the device.
AT$GPSSAV=?	Test command returns the **OK** result code
Example	AT$GPSSAV OK
Note	The module must be restarted to use the new configuration

3.5.5.4.5. Unsolicited NMEA Data Configuration - $GPSNMUN

$GPSNMUN - Unsolicited NMEA Data Configuration	
AT$GPSNMUN=<enable>[,<GGA>[,<GLL>[,GSA[,GSV[,RMC[,VTG]]]]]]	Set command permits to activate an Unsolicited streaming of GPS data (in NMEA format) through the standard GSM serial port and defines which NMEA sentences will be available Parameters: **<enable>** 0 - NMEA data stream de-activated (default) 1 - NMEA data stream activated with the following unsolicited response syntax: **$GPSNMUN:<CR><NMEA SENTENCE><CR>** 2 - NMEA data stream activated with the following unsolicited response syntax: **<NMEA SENTENCE><CR>** 3 - NMEA data stream; only available on the UART port **<GGA>** - Global Positioning System Fix Data 0 - disable (default) 1 – enable **<GLL>** - Global Positioning System Fix Data 0 - disable (default) **<GSA>** - Global Positioning System Fix Data 0 - disable (default)

$GPSNMUN - Unsolicited NMEA Data Configuration	
	1 – enable <**GSV**> - GPS Satellites in View 0 - disable (default) 1 – enable <**RMC**> - Global Positioning System Fix Data 0 - disable (default) 1 – enable <**VTG**> - Global Positioning System Fix Data 0 - disable (default) 1 – enable
AT$GPSNMUN?	Read command returns whether the unsolicited GPS NMEA data streaming is currently enabled or not, along with the NMEA sentences availability status, in the format: **$GPSNMUN:<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>**
AT$GPSNMUN=?	Test command returns the supported range of values for parameters **$GPSNMUN: <enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>**
Example	AT$GPSNMUN=1,1,0 OK *These sets the GGA as available sentence in the unsolicited message* AT$GPSNMUN=0 OK *Turn-off the unsolicited mode* AT$GPSNMUN? $GPSNMUN: 0,0,0,0,0,0,0 OK

3.5.5.5. SIMTOOLKIT AT Commands Set

3.5.5.5.1. SIMTOOLKIT Activation Interface - #STIA

#STIA – SIMTOOLKIT Activation Interface	
AT#STIA= <mode>,[<devpath>]	Execution command stores the current SIMTOOLKIT mode parameter and set command sets the port output SIMTOOLKIT notification data in the NVM of the device Parameters: **<mode>** 0 - disable SAT (no **<timeout>** required, if given will be ignored) 1 - enable SAT without unsolicited indication **+STKPRO** (default) 2 - enable SAT and extended unsolicited indication **+STKPRO** **<devpath>** 0 – USART0 (default)

#STIA – SIMTOOLKIT Activation Interface	
	1 – USB0 2 – USB3 Note 1: every time the SIM application issues a proactive command that requires user interaction an unsolicited code will be sent, if enabled with #STIA command, as follows: [URC type 1 : +STKPRO] +STKPRO command displays the list of supported proactive commands. test command returns set of proactive commands supported. Only test command is allowed In addition there is an unsolicited result code +STKPRO: <proactive_cmd> … Provided defined as: - +STKPRO: 01, <type> - +STKPRO: 05, <event list> - +STKPRO: 16, <number>, <subaddr>, <type>, <alpha_1>, <icon_id1>, <alpha_2>, <icon_id2> - +STKPRO: 17, <ss_data>, <alpha>, <icon_id> - +STKPRO: 18, <dcs>, <hex_string>, <alpha>, <icon_id> - +STKPRO: 19, <alpha>, <icon_id> - +STKPRO: 20, <alpha>, <icon_id>, <dtmf_string> - +STKPRO: 21, <URL>, <alpha>, <icon_id> - +STKPRO: 32, <tone>, <unit>, <interval>, <alpha>, <icon_id> - +STKPRO: 33, <type>, <dcs>, <hex string>, <icon_id> - +STKPRO: 34, <type>, <dcs>, <hex string>, <icon_id> - +STKPRO: 35, <type>, <dcs>, <hex string>, <max rsp len>, <min rsp len>, <defaulttext>, <icon_id> - +STKPRO: 36, <type>, <alpha>, <item_id>, <total items>, <item_text>, <next_action>, <default_item>, <icon_id>, <icon_id_list_element> - +STKPRO: 37, <type>, <alpha>, <item_id>, <total items>, <item_text>, <next_action>, <icon_id>, <icon_id_list_element> - +STKPRO: 38,<type> - +STKPRO: 40, <dcs>, <hex string>, <icon_id> - +STKPRO: 52, <type>, <alpha>, <icon_id> - +STKPRO: 53, <language> AT+STKPRO=? +STKPRO=01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,53 OK Defined values <alpha>,<alpha_1>,<alpha_2>,<item_text>,<default text>: text string <dcs> data coding scheme <default_item> default item (s. item_id) <event list> may be: - 04: User activity event

#STIA – SIMTOOLKIT Activation Interface	
	- 05: Idle screen available event - 07: Language selection - 08: Browser Termination event <hex_string> sting containing data in hexadecimal format <icon_id>,<icon_id1>,<icon_id2> ,<icon_id_list_element> icon identifier list object (list containing icon id's. Example:<icon_id1>,<icon_id2>) <interval> time duration in number of units <item_id> item identifier (Identifier of item chosen s. GSM11.14) <language> 2 bytes string indicating the language <max rsp len> maximum response length <min rsp len> minimum response length <next_action> next action <number> called party number <proactive_cmd> may be: - 01: refresh - 05: set up event list - 16: set up call - 17: send SS - 18: send USSD - 19: send SMS - 20: send DTMF - 21: launch browser - 32: play tone - 33: display text - 34: get inkey - 35: get input - 36: select item - 37: set up menu - 38: language setting - 40: set up idle mode text - 53: language notification <ref_number> reference number <subaddr> called party subaddr. <ss_data> data string <type> integer as command qualifier; possible value 4 meaning "language" <tone> tone may be: - 01: dial tone - 02: call subscriber busy - 03: congestion - 04: radio path acknowledge - 05: radio path not available - 06: error / special information - 07: call waiting tone - 08: ringing tone - 10: general beep - 11: positive acknowledgement tone - 12: negative acknowledgement or error tone <total items> total items

#STIA – SIMTOOLKIT Activation Interface	
	<unit> may be: - 0: minutes - 1: seconds - 2: tenth of seconds <URL> URL that shall be loaded [URC type 2 : +STKCC] **SIM-APPL-TK Call Control Commands +STKCC** The SIMAP call control status is displayed using the unsolicited result code +STKCC: <cc_comand>… defined as: - +STKCC: 1,<res_val>,<alpha>,<number> - +STKCC: 2,<res_val>,<alpha>,<ss_code> - +STKCC: 3,<res_val>,<alpha>,<ussd_code> - +STKCC: 4,<res_val>,<alpha>,<ton_npi>,<sc_addr>,<ton_npi>,<dest_addr> **Defined values** <cc_command> may be: - 1: set up call - 2: send SS - 3: send USSD - 4: send SM **<res_val>** call control result value **<alpha>** text string **<number>** called party number **<ton_npi>** type of number and numbering plan **<sc_addr>** service centre address **<dest_addr>** destination address [URC type 3 : +STKCNF] **SIM-APPL-TK Proactive Session Status +STKCNF** The SIMAP proactive session status is displayed using the unsolicited result code +STKCNF: <proactive_cmd>,<result>,<add_result>,<sw1> **Defined values** **<proactive_cmd>** decimal code indicates the command that was finished (refer +STKPRO) **<result>** general result code **<add_result>** additional result code **<sw1>** status of the last response may be: - 0: command to SIM was suppressed because of multiple terminal response or wrong client - other responses see GSM 11.11
AT#STIA?	Read command returns the SIMTOOLKIT mode and device path parameters in

#STIA – SIMTOOLKIT Activation Interface	
	NVM. **#STIA=<mode>, <devpath>**
AT#STIA?	Test command returns the supported range of values for parameters **#STIA=<mode>, <devpath>**

3.5.5.5.2. SIMTOOLKIT Browser Request - +STKBR

+STKBR – SIMTOOLKIT Browser Request	
AT+STKBR=<result>,[<add result>]	This command allows to enter a response to a SIM -APPL-TK launch browser request. The SIMAP command Launch Browser is sent to the DTE using the unsolicited result code: **+STKLBR: <cmd_details>,<URL>,[<bearer>],[gateway],[<Ref_1>], … ,[Ref_n].** Parameters: **<result>** terminal response result **<add result>** additional result **Defined values** **<cmd_details>:** describes in which way the browser should be launched. - 00 launch browser, if not already launched - 02 use the existing browser (the browser shall not use the active existing secured session) ; - 03 close the existing browser session and launch new browser session; **<URL>** URL that shall be loaded <bearer> - '00' SMS - '01' CSD - '02' USSD - '03' GPRS **<gateway>**: This text gives to the mobile the name/identity of the Gateway/Proxy to be used for connecting to the URL. **<Ref_1>,.. <Ref_n>** Provisioning File Reference **<result>** see command +STKTR <add_result> see command +STKTR
AT+STKBR=?	Test command returns the **OK** result code

3.5.5.5.3. SIMTOOLKIT Terminla Response - +STKTR

+STKTR – SIMTOOLKIT Terminal Response	
AT+STKTR=<proactive_cmd>[,<result>,<add_result>[,<last_cmd>][,<dcs>][,<hex string>]]	This action command allows entering the response to a SIM -APPL-TK proactive command which was displayed by the unsolicited result code +STKPRO. • Set command allows entering the proactive response to SIM application TK. If fails returns CME ERROR :<error> • Test command returns supported proactive response list.

+STKTR – SIMTOOLKIT Terminal Response	
	The parameters depend on the proactive command: +STKTR: 01, <result>, [<add_result>] refresh +STKTR: 05, <result> set up event list +STKTR: 16, <result>, [<add_result>] set up call +STKTR: 17, <result>, <add_result> send SS +STKTR: 18, <result>, <add_result> send USSD +STKTR: 19, <result>, <add_result> send SMS +STKTR: 20, <result>,[<add_result>] send DTMF +STKTR: 21: <result> launch browser +STKTR: 32, <result>, <add_result> play tone +STKTR: 33, <result>, <add_result> display text +STKTR: 34, <result>, <add_result>,0,<dcs>,<hex_string> get inkey +STKTR: 35, <result>, <add_result>,0,<dcs>,<hex_string> get input +STKTR: 36, <result>, <add_result>,0,<dcs>,<hex_string> select item Note: the 0 stands for the parameter <last_cmd> which is obsolete but not removed so far +STKTR: 37, <result>, <add_result> set up menu +STKTR: 38, <language as integer, e.g.28261> language setting +STKTR: 40, <result>, <add_result> set up idle mode text Parameters: <add_result> additional result <dcs> data coding scheme <hex_string> string in hexadecimal format <last_cmd> last command <proactive_cmd> decimal code indicates the command (refer +STKPRO) <result> may be (decimal code indicated): - 0: command performed successfully - 1: command performed with partial comprehension - 2: command performed with missing information - 3: REFRESH performed with additional Efs read - 4: command performed successfully, but requested icon could not be displayed - 5: command performed but modified by call control by SIM - 6: command performed successfully, limited service - 7: command performed with modification - 16: proactive SIM session terminated by the user - 17: backward move in the proactive SIM session requested by the user - 18: no response from user - 19: help information required by the user - 20: USSD or SS transaction terminated by the user - 32: ME currently unable to process command - 33: network currently unable to process the command - 34: user did not accept call set-up request

+STKTR – SIMTOOLKIT Terminal Response	
	- 35: user cleared down call before connection or network release - 36: action in contradiction with the current timer state - 37: interaction with call control by SIM, temporary problem - 38: launch browser generic error code - 48: command beyond ME's capabilities - 49: command type not understood by ME - 50: command data not understood by ME - 51: command number not known by ME - 52: SS return error - 53: SMS RP-ERROR - 54: error, required values are missing - 55: USSD return error - 56: MultipleCard commands error, if class "a" is supported - 57: interaction with call control by SIM or MO short message control by SIM, permanent problem - 58: bearer independent protocol error (if class "e" is supported)
AT+STKTR=?	Test command returns the supported proactive command list.

3.5.5.5.4. SIMTOOLKIT Envelope command - +STKENV

+STKENV – SIMTOOLKIT Envelop command	
AT+STKENV=<envelope_cmd>,<optional_ENV_data>	This command allows to send a SIM -APPL-TK envelope command. Set command allows sending a SIM -APPL-TK envelope command. If fails returns CME ERROR :<error> **Syntax of Command:** AT+STKENV=<envelope_cmd>,<optional_ENV_data> AT+STKENV=214,7,<language> AT+STKENV=214,8,<cause > AT+STKENV=211,<item_id>,<help_requested> Parameters: **<envelope_cmd>** supported envelope commands: - code 211 (hexa D3): menu selection (needs <item identifier>) - code 214 (hexa D6): Event download (only one event can be included in the <event_list>) **<optional_ENV_data>** indicates command code related parameters as follows: - for code 211 (hexa D3): <item identifier> - for code 214 (hexa D6): <event list> Where : **<cause>** may be: - 00: User Termination - 01: Error Termination **<item_id>** item identification

+STKENV – SIMTOOLKIT Envelop command	
	<help_requested> indicates help requested and may be: - 1: help is requested - 0: help is not requested **<language>** currently used language in the DTE (coding see 11.14)
AT+STKENV=?	Test command returns the **OK** result code

3.5.5.5.5. SIMTOOLKIT terminal Profile - +STKPROF

+STKPROF – SIMTOOLKIT terminal Profile	
AT+STKPROF=<length>,<data>	This command allows reading and changing the terminal profile data. The terminal profile sent by external STK client states the facilities relevant to SIM Application Toolkit that is supported. Parameters: **<length>:** integer type value; length of the characters that are sent to TE in <data> *Note: <length> set to 0 forces a reset to the default terminal profile stored in the ME.* **<data>**: terminal profile data coded in hex format.
AT+STKPROF?	Read command returns the simtoolkit profile list SAT Terminal Profile according to 3GPP TS 31.114, i. e. the list of SIM Application Toolkit facilities that are supported by the ME. The profile cannot be changed by the TA. +STKPROF: <length>,<data> e.g. +STKPROF=4,"1F7F" OK
AT+STKPROF=?	Test command returns the **OK** result code

4. ACRONYMS AND ABBREVIATIONS

ARFCN	Absolute Radio Frequency Channel Number
AT	Attention command
BA	BCCH Allocation
BCCH	Broadcast Control Channel
CA	Cell Allocation
CBM	Cell Broadcast Message
CBS	Cell Broadcast Service
CCM	Current Call Meter
CLIR	Calling Line Identification Restriction
CTS	Clear To Send
CUG	Closed User Group
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DCS	Digital Cellular System
DGPS	Differential GPS, the use of GPS measurements, which are differentially corrected
DNS	Domain Name System Server
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Fraquency
DTR	Data Terminal Ready
GGA	GPS Fix data
GLL	Geographic Position – Latitude/Longitude
GLONASS	Global positioning system maintained by the Russian Space Forces
GMT	Greenwich Mean Time
GNSS	Any single or combined satellite navigation system (GPS, GLONASS and combined GPS/GLONASS)
GPRS	Global Packet Radio Service
GPS	Global Positioning System
GSA	GPS DOP and Active satellites
GSM	Global System Mobile
GSV	GPS satellites in view
HDLC	High Level Data Link Control
HDOP	Horizontal Dilution of Precision
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IRA	International Reference Alphabet
IWF	Interworking Function
MO	Mobile Originated
MT	Mobile Terminal
NMEA	National Marine Electronics Association
NVM	Non Volatile Memory
PCS	Personal Communication Service
PDP	Packet Data Protocol

PDU	Packet Data Unit
PIN	Personal Identification Number
PPP	Point to Point Protocol
PUK	Pin Unblocking Code
RLP	Radio Link Protocol
RMC	Recommended minimum Specific data
RTS	Request To Send
SAP	SIM Access Profile
SCA	Service Center Address
SMS	Short Message Service
SMSC	Short Message Service Center
SMTP	Simple Mail Transport Protocol
TA	Terminal Adapter
TCP	Transmission Control Protocol
TE	Terminal Equipment
UDP	User Datagram Protocol
USSD	Unstructured Supplementary Service Data
UTC	Coordinated Universal Time
VDOP	Vertical dilution of precision
VTG	Course over ground and ground speed
WAAS	Wide Area Augmentation System

5. Document History

Revision	Date	Changes
0	2010-11-26	First issue
1	2011-02-24	Updated first feature completed version
2	2011-09-08	Updated for AT&T IOT for HE863-NAD
3	2011-12-21	Updated for AT&T IOT for HE863-NAR Update for 11.00.xx2 for HE863-EUD/EUR/AUD/AUR
4	2012-02-01	Updated for 11.00.xx2 for HE863-NAG/EUG/AUG
5	2012-08-01	Update for AT+CPIN a few other commands
6	2012-11-12	Update for AT+CGDCONT and a few other commands