AT Commands Reference Guide

For LE922A6

80498ST10720A Rev. 0 – 2016-06-29

Making machines talk.

APPLICABILITY TABLE

PRODUCT
LE922A6-A1
LE922A6-E1

SW Version
24.00.201 24.00.221

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Contents

1. Introduction

1.1. Scope

This document is aimed in providing a 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's 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:
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To register for product news and announcements or for product questions contact Telit's 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. 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.

1.5. Related Documents

- 3GPP TS 27.007 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/

- 3GPP TS 27.005 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/

- Hayes standard AT command set

2. Overview

2.1. About the document

This document is to describe all AT commands implemented on the Telit wireless modules listed on the Applicabilty Table.

2.2. General remark about packet domain services in UMTS/GPRS and EPS

2.2.1. Attach/Detach procedure for packet domain services

For easy reading, the term PS attach and/or PS detach is used for GPRS attach/detach procedure in UMTS/GPRS as well as EPC attach/detach procedure in EPS

2.2.2. EPS bearer context and PDP context

Accordingly to 3GPP TS 23.401, there is a 1 to 1 mapping between active EPS bearer context and active PDP context:

- An active default EPS bearer context is associated with an active non secondary PDP context.
- An active dedicated EPS bearer context is associated with an active secondary PDP context.

For easy reading, the term PDP context is used for PDP contexts in UMTS/GPRS as well as PDN/default EPS bearers and traffic flows in EPS.

3. AT COMMANDS

The Telit wireless module family can be controlled 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. ETSI GSM 27.007 specific AT command set for User Equipment.
3. ETSI GSM 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)

Moreover Telit wireless module family supports also Telit proprietary AT commands for special purposes.
The following is a description of how to use the AT commands with the Telit wireless module family.

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 recognized 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 sub parameter 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 sub parameter 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 sub parameters, 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 sub parameter.

[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.

3.2. AT Command Syntax

The syntax rules followed by Telit implementation of both 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 sub parameters; they also have a Read command (trailing **?**) to check the current values of sub parameters.

- **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 sub parameters are associated with the action, the ranges of sub parameters values that are supported.

Action commands don't store the values of any of their possible sub parameters.
In case of Telit command, "read" action may be used for the specific purpose.
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 sub parameters 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 sub parameters to be retained.

3.2.1. String Type Parameters

A string, either enclosed between quotes or not, is considered 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 sub parameter
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 sub parameter is omitted.

+CMD1?<CR> This is a Read command for checking current sub parameter values

+CMD1=?<CR> This is a test command for checking possible sub parameter 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 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 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 **<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.

[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**

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.**

3.2.3. 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
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
General purpose error:	
100	unknown
601	wrong state
602	Can not activate
606	Bad or no response from server
608	Already connected
613	Data socket yet opened in cmdmode
614	FTP CmdMode data socket closed

Numeric Format	Verbose Format
615	Service is not available
616	Invalid user id
617	Invalid password
618	File is not found
770	SIM invalid
GPRS related errors to a failure to perform an Attach:	
103	Illegal MS (#3)*
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	timeout 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)
Supplementary service related error	
257	network rejected request
258	retry operation
259	invalid deflected to number
260	deflected to own number
261	unknown subscriber
262	service not available
263	unknown class specified
264	unknown network message
AT+COPS test command related error	
680	LU processing
681	Network search aborted
682	PTM mode
AT+WS46 test command related error	

Numeric Format	Verbose Format
683	Active call state
684	RR connection Established
AES Command related error	
955	AES encryption or decryption is working
956	AES empty buffer
957	AES key wrong or not stored
958	AES data wrong length

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

3.2.4. 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
512	FDN not allowed number

3.2.5. 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

3.2.6. 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	125 (test command)
+CLCK	15 (SS operation) 5 (FDN enabling/disabling)
+CPWD	15 (SS operation) 5 (PIN modification)
+CLIP	15 (read command)
+CLIR	15 (read command)
+CCFC	15
+CCWA	15
+CHLD	60
+CPIN	30
+CPBS	5 (FDN enabling/disabling)
+CPBR	5 (single reading) 15 (complete reading of a 500 records full phonebook)
+CPBF	10 (string present in a 500 records full phonebook)

	5 (string not present)
+CPBW	5
+CACM	5
+CAMM	5
+CPUC	180
+VTS	20 (transmission of full “1234567890*#ABCD” string with no de lay between tones, default duration)
+CSCA	5 (read and set commands)
+CSAS	5
+CRES	5
+CMGS	120 after CTRL-Z; 1 to get ‘>’ prompt
+CMSS	120
+CMGW	5 after CTRL-Z; 1 to get ‘>’ prompt
+CMGD	5 (single SMS cancellation) 25 (cancellation of 50 SMS)
+CNMA	120 after CTRL-Z; 1 to get ‘>’ prompt
+CMGR	5
+CMGL	100
+CGACT	150
+CGATT	140
D	120 (voice call) Timeout set with ATS7 (data call)
A	60 (voice call) Timeout set with ATS7 (data call)
H	60
+CHUP	60
+COPN	10
+COPL	180
+WS 46	10
#MBN	10
#TONE	5 (if no duration specified)
#EMAILD	90
#STSR	30
#GPRS	150

#SKTD	140 (DNS resolution + timeout set with AT#SKTCT)
#QDNS	170
#FTPOPEN	120 (timeout set with AT#FTPTO, in case no response is receive d from server)
#SGACT	150
#SH	10
#SD	140 (DNS resolution + connection timeout set with AT#SCFG)
#CSURV	125
#CSURVC	125
#CSURVUC	125
#CSURVB	125
#CSURVBC	125
#CSURVP	125
#CSURVPC	125

3.2.7. 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 lose 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** that was historically the one that was saved and restored in early releases of code, and the **extended section** that 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 start up. **&Y** instructs the device to load at start up only the **base section**. **&P** instructs the device to load at start up 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 (**+CSAS**, **#SLEDSAV**, **#SKTSAV**, **#ESAV**); all of these values are read at power-up.

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

AUTOBAUD :	+IPR
COMMAND ECHO:	E
RESULT MESSAGES:	Q
VERBOSE MESSAGES:	V
EXTENDED MESSAGES:	X
FLOW CONTROL OPTIONS:	&K, +IFC
DSR (C107) OPTIONS:	&S
DTR (C108) OPTIONS:	&D
RI (C125) OPTIONS :	\R
POWER SAVING:	+CFUN
DEFAULT PROFILE:	&Y0
S REGISTERS:	S0;S1;S2;S3;S4;S5;S7;S12;S25;S30;S38
CHARACTER FORMAT:	+ICF

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

+FCLASS,	+CLIR,	+DR,
+CSCS,		
+CRC,	+CSNS,	+CVHU,
+CREG,	+CLIP,	+CNMI,
+CCWA,	+CUSD,	+CAOC,
+CSSN,	+CIND,	+CMER,
+CPBS,	+CMEE,	+CGREG,
+CMGF,	+CSDH,	

#QSS,	#ACAL,	#PSMRI
#ACALEXT,	#ECAM,	#SMOV,
#MWI,	#NITZ,	#SKIPESC,
#STIA,	#E2ESC,	#CFLO,
#SIMDET,	#SIMPR,	#NOPT,
#NOPTEXT		
+CALM,	+CRSL,	+CMUT,
+CLVL,	+VTD,	+CGEREP
#PCMTXG	#PCMRXG	#DVICFG
#CAP,	#SRS,	#SRP,
#STM,	#DVI,	#E2SMSRI,
#CODEC,	#SHFEC,	#HFMICG,
#HSMICG,	#SHFSD,	#SPKMUT,
#E2SLRI,	#HFRECG	#HSRECG,
#SHSEC,	#SHSNR,	#SHFNR,
#SHSSD,	#TSVOL,	
#TEMPMON (lt is partially stored in NVM, see command description),		#CFF,
#PSNT,	+CTZU,	+CTZR,
+CSTF,	+CSDF,	
+CSTA,	+CSIL,	
+CSVM,	+COLP,	+CCWE,
#NWEN,	#CODECINFO,	#E2RI,
#CIPHIND	#DVICLK	#DAC
+CPNER		

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 start up:

#SELINT,	+COPS[3],	+CGCLASS,
+CGDCONT,	+CGQMIN,	+CGQREQ,
+CGEQMIN,	+CGEQREQ,	+WS46,
#DIALMODE,	#BND,	#AUTOBND,
#SCFG,	#AUTOATT,	+CGSMS
#DNS,	#ICMP,	#TTY,
#SCFGEXT,	#SCFGEXT2,	#SGACTCFG[3],
#SGACTCFGEXT,	#BASE64,	#PLMNMODE,
#ESMTPPORT,	#SMSATRUN,	#SMSATRUNCFG,
#TCPATRUNCFG,	#TCPATRUNFRWL,	#TCPATRUNAUTH,
#TCPATRUNL,	#TCPATRUND,	#ENAEVMONI,
#ENAEVMONICFG,	#EVMONI	#SIMINCFG
#FPLMN	#CCLKMODE	#WCDMADOM
#PLMNUPDATE	#NASC	
#WKIO	#CONSUMECFG	#ENACONSUME
+CGEQOS	#PROTOCOLCFG	#RXDIV
#LRXDIV	#FASTSHDN	#TESTMODE

[3] It is partially stored in NVM; see command description.

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

+CSCA, +CSMP, +CSCB
Stored by +CSAS[4] command and restored by +CRES[4] command.

#SLED
Stored by #SLEDSAV command.

#USERID, #PASSW, #PKTSZ,
#DSTO, #SKTTO, #SKTSET
#SKTCT
Stored by #SKTSAV command and automatically restored at start up; factory default values are restored by #SKTRST command.

#ESMTP, #EADDR, #EUSER,
#EPASSW
Stored by #ESAV command and automatically restored at start up; factory default values are restored by #ERST command.

The values set by following commands are stored mobileap_cfg.xml in AP side file.
#ICMLANCFG #ICMWANCFG #ICMAUTOCONN

The values set by following commands are stored vlan.conf in AP side
#VLANLIST #VLANTAGGED

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

4. Availability Table

Telit wireless module family can be selected via Technology or Functional(AT) availability in accordance with customer's necessary condition.

4.1. Technology Availability Table

	GSM/GPRS	UMTS	LTE
LE922A6-A1		•	•
LE922A6-E1			•

4.2. AT Commands Availability Table

COMMAND	LE922A6-A1	LE922A6-E1	Function
Command Line General Format – Command Line Prefixes			
AT	•	•	Starting A Command Line
A/	•	•	Last Command Automatic Repetition Prefix
#/	•	•	Repeat Last Command
General Configuration Commands			
#SELINT	•	•	Select Interface Style
#NOPT	•	•	Set Notification Port
#NOPTEXT	•	•	Set Notification Port Extension
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
&Z	•	•	Store Telephone Number In The Module Internal Phonebook
&N	•	•	Display Internal Phonebook Stored Numbers
+GMI	•	•	Manufacturer Identification
+GMM	•	•	Model Identification
+GMR	•	•	Revision Identification
+GCAP	•	•	Capabilities List

+GSN	•	•	Serial Number
&V	•	•	Display Current Base Configuration And Profile
&V0	•	•	Display Current Configuration And Profile
&V1	•	•	S Registers Display
&V3	•	•	Extended S Registers Display
&V2	•	•	Display Last Connection Statistics
\V	•	•	Single Line Connect Message
+GCI	•	•	Country Of Installation
%L	•	•	Line Signal Level
%Q	•	•	Line Quality
L	•	•	Speaker Loudness
M	•	•	Speaker Mode
Hayes AT Commands – DTE-Modem Interface Control			
E	•	•	Command Echo
Q	•	•	Quiet Result Codes
V	•	•	Response Format
X	•	•	Extended Result Codes
I	•	•	Identification Information
&C	•	•	Data Carrier Detect (DCD) Control
&D	•	•	Data Terminal Ready (DTR) Control
&K	•	•	Flow Control
\Q	•	•	Standard Flow Control
&S	•	•	Data Set Ready (DSR) Control
\R	•	•	Ring (RI) Control
+IPR	•	•	Fixed DTE Interface Rate
+IFC	•	•	DTE-Modem Local Flow Control
+ICF	•	•	DTE-Modem Character Framing
Hayes AT Commands – Call Control			
D	•	•	Dial
T	•	•	Tone Dial
P	•	•	Pulse Dial
A	•	•	Answer
H	•	•	Disconnect
O	•	•	Return To On Line Mode
Hayes AT Commands – Modulation Control			
%E	•	•	Line Quality Monitor And Auto Retrain Or Fallback/Fallforward
Hayes AT Commands – Compression Control			
+DS	•	•	Data Compression
+DR	•	•	Data Compression Reporting
Hayes AT Commands – S Parameters			

S0	•	•	Number Of Rings To Auto Answer
S1	•	•	Ring Counter
S2	•	•	Escape Character
S3	•	•	Command Line Termination Character
S4	•	•	Response Formatting Character
S5	•	•	Command Line Editing Character
S7	•	•	Connection Completion Time-Out
S10	•	•	Carrier Off With Firm Time
S12	•	•	Escape Prompt Delay
S25	•	•	Delay To DTR Off
S30	•	•	Disconnect Inactivity Timer
S38	•	•	Delay Before Forced Hang Up
3GPP TS 27.007 AT Commands – 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)
+CMUX	•	•	Multiplexing Mode
+CCID	•	•	Read ICCID (Integrated Circuit Card Identification)
#CMUXMODE	•	•	CMUX mode set
#CDORM	•		Dormant Control Command
3GPP TS 27.007 AT Commands – Call Control			
+CHUP	•	•	Hang Up Call
+CEER	•		Extended Error Report
+CRC	•	•	Cellular Result Codes
+CSNS	•		Single Numbering Scheme
+CVHU	•		Voice Hang Up Control
+CSTA	•		Select Type of Address
3GPP TS 27.007 AT Commands – Network Service Handling			
+CNUM	•	•	Subscriber Number
+COPN	•	•	Read Operator Names
+CREG	•	•	Network Registration Report
+CEREG	•	•	EPS – Network Registration status
+COPS	•	•	Operator Selection
+WS46	•	•	PCCA STD-101 Select Wireless Network
+CLCK	•	•	Facility Lock/Unlock
+CPWD	•	•	Change Facility Password
+CLIP	•		Calling Line Identification Presentation

+CLIR	•		Calling Line Identification Restriction
+COLP	•		Connected Line Identification Presentation
+COLR	•		Connected line identification restriction status
+CCFC	•		Call Forwarding Number And Conditions
+CCWA	•		Call Waiting
+CHLD	•		Call Holding Services
+CTFR	•		Call deflection
+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
+CDIP	•		Called line identification presentation
3GPP TS 27.007 AT Commands – Mobile Equipment Control			
+CPAS	•	•	Phone Activity Status
+CFUN	•	•	Set Phone Functionality
+CPIN	•	•	Enter PIN
+CSQ	•		Signal Quality
+CIND	•	•	Indicator Control
+CMER	•	•	Mobile Equipment Event Reporting
+CPBS	•	•	Select Phonebook Memory Storage
+CPBR	•	•	Read Phonebook Entries
+CPBF	•	•	Find Phonebook Entries
+CPBW	•	•	Write Phonebook Entry
+CCLK	•	•	Clock Management
+CALA	•	•	Alarm Management
+CALD	•	•	Delete Alarm
+CAPD	•	•	Postpone alarm
+CSDF	•	•	Time Zone reporting
+CSTF	•	•	Setting time format
+CTZR	•	•	Time Zone reporting
+CTZU	•	•	Automatic Time Zone update
+CRSM	•	•	Restricted SIM Access
+CSIM	•	•	Generic SIM Access
+CALM	•	•	Alert Sound Mode
+CRSL	•		Ringer Sound Level
+CLVL	•	•	Loudspeaker Volume Level
+CMUT	•		Microphone Mute Control

+CSIL	•	•	Silence command
+CACM	•	•	Accumulated Call Meter
+CAMM	•	•	Accumulated Call Meter Maximum
+CPUC	•	•	Price Per Unit And Currency Table
+CCWE	•		Call Meter maximum event
+CSVM	•		Set voice mail number
+CLAC	•	•	Available AT commands
+CCHO	•	•	Open Logical Channel
+CCHC	•	•	Close Logical Channel
+CGLA	•	•	Generic UICC Logical Channel access
+CUAD	•	•	UICC Application Discovery
+CPINR	•	•	Remaining PIN retries
+CESQ	•	•	Extended Signal Quality
+CPNER	•	•	Primary Notification Event Reporting
3GPP TS 27.007 AT Commands – Mobile Equipment Errors			
+CMEE	•	•	Report Mobile Equipment Error
3GPP TS 27.007 AT Commands – Voice Control			
+VTS	•		DTMF Tones Transmission
+VTD	•		Tone Duration
3GPP TS 27.007 AT Commands – Commands For GPRS			
+CGCLASS	•		GPRS Mobile Station Class
+CGATT	•	•	PS Attach Or Detach
+CGEREP	•	•	Packet Domain Event Reporting
+CGREG	•		GPRS Network Registration Status
+CGDCONT	•	•	Define PDP Context
+CGQREQ	•	•	Quality Of Service Profile (Requested)
+CGEQREQ	•		3G Quality Of Service Profile (Requested)
+CGQMIN	•	•	Quality Of Service Profile (Minimum Acceptable)
+CGEQMIN	•		3G Quality Of Service Profile (Minimum Acceptable)
+CGACT	•	•	PDP Context Activate Or Deactivate
+CGEQNEG	•		3G Quality Of Service Profile (Negotiated)
+CEMODE	•	•	Set Mode of Operator for EPS
+CGPADDR	•	•	Show PDP Address
+CGCMOD	•	•	Modify PDP State
+CGCONTRDP	•	•	PDP Context Read Dynamic Parameters
+CGEQOS	•	•	Define EPS Quality of Service
+CGEQOSRDP	•	•	EPS Quality of Service Read Dynamic Parameters
+CGPIAF	•	•	Pinting IP Address Format
+CGTFTRDP	•	•	Traffic Flow Template Read Dynamic Parameters
3GPP TS 27.007 AT Commands – Commands For Battery Charger			

+CBC	•	•	Battery Charge
3GPP TS 27.005 AT Commands – Message Configuration			
+CSMS	•	•	Select Message Service
+CPMS	•	•	Preferred Message Storage
+CMGF	•	•	Message Format
3GPP TS 27.005 AT Commands – Message Configuration			
+CSCA	•	•	Service Center Address
+CSMP	•	•	Set Text Mode Parameters
+CSDH	•	•	Show Text Mode Parameters
+CSCB	•	•	Select Cell Broadcast Message Types
+CSAS	•	•	Save Settings
+CRES	•	•	Restore Settings
+CMMS	•	•	More Messages to Send
3GPP TS 27.005 AT Commands – Message Receiving And Reading			
+CNMI	•	•	New Message Indications To Terminal Equipment
+CNMA	•	•	New Message Acknowledgment to ME/TA
+CMGL	•	•	List Messages
+CMGR	•	•	Read Message
3GPP TS 27.005 AT Commands – Message Sending And Writing			
+CMGS	•	•	Send Message
+CMSS	•	•	Send Message From Storage
+CMGW	•	•	Write Message To Memory
+CMGD	•	•	Delete Message
+CGSMS	•		Select Service for MO SMS messages
Custom AT Commands – General Configuration			
+PACSP	•	•	Network Selection Menu Availability
#CGMI	•	•	Manufacturer Identification
#CGMM	•	•	Model Identification
#CGMR	•	•	Revision Identification
#CGSN	•	•	Product Serial Number Identification
#CIMI	•	•	International Mobile Subscriber Identity (IMSI)
#CCID	•	•	Read ICCID (Integrated Circuit Card Identification)
#SPN	•	•	Service Provider Name
#CEER	•		Extended Numeric Error report
#CEERNET	•		Extended Error report for Network Reject cause
#PCT	•	•	Display PIN Counter
#SHDN	•	•	Software Shut Down
#FASTSHDN	•	•	Fast Power Down
#REBOOT	•	•	Reboot
#Z	•	•	Extended Reset

#ENHRST	•	•	Periodic Reset
#WAKE	•	•	Wake From Alarm Mode
#TEMPMON	•	•	Temperature monitor
#GPIO	•	•	General Purpose Input/Output Pin Control
#ALARMPIN	•	•	Alarm Pin
#SLED	•	•	STAT_LED GPIO Setting
#SLEDSAV	•	•	Save STAT_LED GPIO Setting
#LEDEN	•	•	LED Pin Control
#E2SMSRI	•	•	SMS Ring Indicator
#E2RI	•	•	Event Ring Indicator
#ADC	•	•	Analog/Digital Converter Input
#DAC	•	•	Digital/Analog Converter Control
#V24CFG	•	•	V24 Output Pins Configuration
#V24	•	•	V24 Output Pins Control
#CBC	•	•	Battery and Charger Status
#AUTOATT	•		PS Auto-Attach Property
#MONI	•	•	Cell Monitor
#MONIZIP	•	•	Compressed Cell Monitor
#MSTATUS	•	•	Modem Status
#CQI	•		HSDPA Channel Quality Indication
#SERVINFO	•	•	Serving Cell Information
#RFSTS	•	•	Read Current Network Status
#CPBD	•	•	Delete All Phonebook Entries
#DIALMODE	•		ATD Dialing Mode
#ACAL	•		Automatic Call
#ACALEXT	•		Extended Automatic Call
#ECAM	•		Extended Call Monitoring
#SMOV	•	•	SMS Overflow
#MBN	•	•	Mailbox Numbers
#MWI	•	•	Message Waiting Indicator
#PSNT	•		Packet Service Network Type
#CFF	•		Call Forwarding Flags
#CODEC	•		Audio Codec
#NITZ	•	•	Network Timezone
#CCLK	•	•	Clock Management
#CCLKMODE	•	•	Clock Mode
#BND	•	•	Select Band
#PLMNMODE	•	•	PLMN List Selection
#PLMNUPDATE	•	•	Update PLMN List
#AUTOBND	•	•	Automatic Band Selection

#GAUTH	•	•	PPP-GPRS Connection Authentication Type
#GPPPCFG	•	•	PPP-GPRS Parameters Configuration
#SKIPESC	•	•	Skip Escape Sequence
#SNUM	•	•	Subscriber Number
#QSS	•	•	Query SIM Status
#SIMDET	•	•	SIM Dection Mode
#SIMPR	•	•	SIM Presence Status
#SIMINCFG	•	•	GPIO SIMIN Configuration
#CGPADDR	•	•	Show Address
#I2CWR	•	•	I2C data via GPIO
#I2CRD	•	•	I2C data from GPIO
#PSMRI	•	•	Power Saving Mode Ring Indicator
#CFLO	•	•	Command Mode Flow Control
#CMGLCONCINDEX	•	•	Report concatenated SMS indexes
#CODECINFO	•		Codec Information
#LANG	•	•	Select Language
#E2ESC	•	•	Escape Sequence Guard Time
#RTCSTAT	•	•	RTC Status
#GSMAD	•	•	GSM Antenna Detection
#NWSCANTMR	•	•	Network Selection Timer
#HWREV	•	•	Hardware Identification
#COLR	•		Connected line identification restriction
#ECTD	•		Enhanced call tone disable
#EONS	•	•	Enhanced operator name string
#CPBGR	•	•	Read Group Entries
#CPBGW	•	•	Write Group Entries
#USBCFG	•	•	USB Configuration
#FPLMN	•	•	Periodical FPLMN clearing
#SCT	•		Show Call Timers
#SCI	•		Show Call Information
+IMEISV	•	•	Request IMSI and SW version
#WCDMADOM	•		WCDMA domain selection
#CIPHIND	•		Ciphering Indication
#NASC	•		Non-Access-Stratum Compliance
#UDUB	•		User Determined User Busy
#WKIO	•		Set RING CFG Parameters
#MCSGS	•		Manual Closed Subscriber Group Serach
#CHUP	•		Hang Up Call
#NCIH	•		No Carrirer Indication Handling
#RXDIV	•		Set RX Div and Set DARP

#LRXDIV	•	•	Enable LTE RX Diversity
#TESTMODE		•	Enable Test Mode command in not signalling mode
Custom AT Commands - Easy Scanò Extension			
#CSURV	•	•	Network Survey
#CSURVC	•	•	Network Survey (Numeric Format)
#CSURVU	•	•	Network Survey Of User Defined Channels
#CSURVUC	•	•	Network Survey Of User Defined Channels (Numeric Format)
#CSURVB	•		BCCH Network Survey
#CSURVBC	•		BCCH Network Survey (Numeric Format)
#CSURVF	•	•	Network Survey Format
#CSURVNLF	•	•	<CR><LF> Removing On Easy Scan® Commands Family
#CSURVP	•		PLMN Network Survey
#CSURVPC	•		PLMN Network Survey (Numeric Format)
Custom AT Commands – AT Run Commands			
#SMSATRUN	•	•	Enable SMS AT Run service
#SMSATRUNCFG	•	•	Set SMS AT Run Parameters
#SMSATWL	•	•	SMS AT Run White List
#TCPATRUNCFG	•	•	Set TCP AT Run Service Parameters
#TCPATRUNL	•	•	Enables TCP AT Run Service in listen (server) mode
#TCPATRUNFRWL	•	•	TCP AT Run Firewall List
#TCPATRUNAUTH	•	•	TCP AT Run Authentication Parameters List
#TCPATRUND	•	•	Enable TCP AT Run Service in dial (client) mode
#TCPATRUNCLOSE	•	•	Closing TCP Run AT Socket
#TCPATCMDSEQ	•	•	TCP AT Run Command Sequence
#TCPATCONSER	•	•	TCP Run AT Service to a Serial Port
#ATRUNDELAY	•	•	Run AT command execution
Custom AT Commands – Consume commands			
#CONSUMECFG	•	•	Configure Consume Parameters
#ENACONSUME	•	•	Enable Consume Functionality
#STATSCONSUME	•	•	Report Consume Statistics
#BLOCKCONSUME	•	•	Block/Unblock a Type of Service
#IPCONSUMECFG	•	•	#SGACT/#SSENDLINE Configuration
#SSENDLINE	•	•	Open a Connection, Send Data, Close Connection
Custom AT Commands – Event Monitor Commands			
#ENAEVMONI	•	•	Enable EvMoni Service
#ENAEVMONICFG	•	•	Set EvMoni Service Parameters
#EVMONI	•	•	Event Monitoring
#CMGS	•	•	Send Message
#CMGW	•	•	Write Message To Memory
Custom AT Commands – Multisocket AT commands			

#SS	•	•	Socket Status
#SI	•	•	Socket Info
#SIEXT	•	•	Socket Info Extended
#SGACT	•	•	Context Activation
#SGACTCFG	•	•	Context Activation & Configuration
#SGACTCFGEXT	•	•	Context Activation & Configuration Extended
#SH	•	•	Socket Shutdown
#SCFG	•	•	Socket Configuration
#SCFGEXT	•	•	Socket Configuration Extended
#SCFGEXT2	•	•	Socket Configuration Extended2
#SCFGEXT3	•	•	Socket Configuration Extended3
#SD	•	•	Socket Dial
#SO	•	•	Socket Restore
#ST	•	•	Socket Type
#SL	•	•	Socket Listen
#SLUDP	•	•	UDP Socket Listen
#SA	•	•	Socket Accept
#SLASTCLOSURE	•	•	Detect the cause of a Socket disconnection
#SRECV	•	•	Received Data In Command Mode
#SSEND	•	•	Send Data In Command Mode
#SSENDEXT	•	•	Send Data In Command mode extended
#SSENDUDP	•	•	Send UDP data to a specific remote host
#SSENDUDPEXT	•	•	Send UDP data to a specific remote host extended
#SGACTAUTH	•	•	Easy GPRS Authentication Type
#BASE64	•	•	Base64 encoding/decoding of Socket snet/received data
Custom AT Commands – SSL AT commands			
#SSLCFG	•	•	Configure general parameters of a SSL socket
#SSLD	•	•	Opening a socket SSL to a remote server
#SSLEN	•	•	Enabling a SSL socket
#SSLH	•	•	Closing a SSL socket
#SSLI	•	•	Secure socket Info
#SSLO	•	•	Restoring a SSL socket after a +++
#SSLRECV	•	•	Reading data from a SSL socket
#SSLS	•	•	Reporting the status of a SSL socket
#SSLSECDATA	•	•	Managing the security data
#SSLSEND	•	•	Sending data through a SSL socket
#SSLSENDEXT	•	•	Sending data through a secure socket in Command Mode extended
#SSLSECCFG	•	•	Configure security parameters of a SSL socket
#SSLSECCFG2	•	•	Configure additional parameters of a SSL socket
Custom AT Commands – FTP AT commands			

#FTPTO	•	•	FTP Time-Out
#FTPOPEN	•	•	FTP Open
#FTPCLOSE	•	•	FTP Close
#FTPCFG	•	•	FTP Config
#FTPPUT	•	•	FTP Put
#FTPGET	•	•	FTP Get
#FTPGETPKT	•	•	FTPGET in command mode
#FTPTYPE	•	•	FTP Type
#FTPMSG	•	•	FTP Read Message
#FTPDELE	•	•	FTP Delete
#FTPPWD	•	•	FTP Print Working Directory
#FTPCWD	•	•	FTP Change Working Directory
#FTPLIST	•	•	FTP List
#FTPFSIZE	•	•	Get file size
#FTPAPP	•	•	FTP Append
#FTPREST	•	•	Set restart position
#FTPRECV	•	•	Receive Data in command mode
#FTPAPPEXT	•	•	FTP Append Extended
Custom AT Commands – Enhanced Easy GPRSò Extension			
#USERID	•	•	Authentication User ID
#PASSW	•	•	Authentication Password
#PKTSZ	•	•	Packet Size
#DSTO	•	•	Data Sending Time-Out
#SKTTO	•	•	Socket Inactivity Time-Out
#SKTSET	•	•	Socket Definition
#QDNS	•	•	Query DNS
#CACHEDNS	•	•	DNS Response Caching
#DNS	•	•	Manual DNS Selection
#SKTCT	•	•	Socket TCP Connection Time-Out
#SKTSAV	•	•	Socket Parameters Save
#SKTRST	•	•	Socket Parameters Reset
#GPRS	•	•	PDP Context Activation
#SKTD	•	•	Socket Dial
#SKTL	•	•	Socket Listen
#E2SLRI	•	•	Socket Listen Ring Indicator
#FRWL	•	•	Firewall Setup
#FRWLIPV6	•	•	Firewall Setup for IPV6 addresses
#GDATAVOL	•	•	EPS Data Volume
#ICMP	•	•	ICMP Support
#PING	•	•	Ping Request

#NWDNS	•	•	DNS from Network
#PROTOCOLCFG	•	•	Configure Protocol Parameters
Custom AT Commands – SMS			
#SMSMOVE	•	•	Move Short Message To Other Memory
#SMSMODE	•	•	SMS Commands Operation Mode
#SMSFORMAT	•	•	Select 3GPP or 3GPP2 Format for MO SMS
#ISMSCFG	•	•	Domain Configuration for Outgoing SMS
Custom AT Commands – E-Mail Mangement			
#ESMTP	•	•	E-mail SMTP Server
#EADDR	•	•	E-mail Sender Address
#EUSER	•	•	E-mail Authentication User Name
#EPASSW	•	•	E-mail Authentication Password
#EMAILD	•	•	E-mail Sending
#SMTPCL	•	•	E-mail Sending with attachment
#ESAV	•	•	E-mail Parameters Save
#ERST	•	•	E-mailParameters Reset
#EMAILMSG	•	•	SMTP Read Message
#ESMTPPORT	•	•	E-mail SMTP Port
Custom AT Commands –HTTP AT Commands			
#HTTPCFG	•	•	Configure HTTP parameters
#HTTPQRY	•	•	Send HTTP GET, HEAD or DELETE request
#HTTPSND	•	•	Send HTTP server data
#HTTPRCV	•	•	Receive HTTP server data
Custom AT Commands - SIM Toolkit			
#STIA	•	•	SIM Toolkit Interface Activation
#STGI	•	•	SIM Toolkit Get Information
#STSR	•	•	SIM Toolkit Send Response
Custom AT Commands – SAP AT Commands			
#RSEN	•	•	Remote SIM enable
Custom AT Commands - Audio AT Commands			
#CAP	•	•	Change Audio Path
#SRS	•	•	Select Ringer Sound
#SRP	•	•	Select Ringer Path
#HFMICG	•	•	Handsfree Microphone Gain
#HSMICG	•	•	Handset Microphone Gain
#HFRECG	•	•	Handsfree Receiver Gain
#HSRECG	•	•	Handset Receiver Gain
#PCMTXG	•	•	PCM Tx Volume
#PCMRXG	•	•	PCM Rx Volume
#SHFSD	•	•	Set Headset Sidetone

#SHSSD	•	•	Set Handset Sidetone
#SPKMUT	•	•	Speaker Mute Control
#OAP	•	•	Open Audio Loop
#STM	•	•	Signaling Tones Mode
#TONE	•	•	Tone Playback
#TSVOL	•	•	Tone Classes Volume
#UDTSET	•	•	User Defined Tone SET
#UDTSAV	•	•	Save User Defined Tones
#UDTRST	•	•	User Defined Tone Reset
#ADSPC	•	•	Audio DSP Configuration
#SHFEC	•	•	Handsfree Echo Canceller
#SHSEC	•	•	Handset Echo Canceller
#SHFNR	•	•	Handsfree Noise Reduction
#SHSNR	•	•	Handset Noise Reduction
#DTMF	•		Embedded DTMF decoder enabling
#DVI	•	•	Digital Voiceband Interface
#DVICFG	•	•	DVI Configuration
#DVICLK	•	•	DVI Clock Activation
#TTY	•		TeleType Writer - #TTY
Custom AT Commands - Audio file management and Play			
#ASIZE	•	•	Audio available size
#ALIST	•	•	List audio file
#ADELF	•	•	Delete an audio file
#ADELA	•	•	Delete all files
#ASEND	•	•	Send an audio file
#ARECV	•	•	Receive an audio file
#ARECD	•	•	Record an audio file
#APLAY	•	•	Play an audio file
#AFIND	•	•	Find an audio file
Custom AT Commands - Emergency call Management			
#EMRGD	•		Dial an emergency call
#NWEN	•	•	Network Emergency Number Update
Advanced Encryption Standard AT commands			
#AESSECDATA	•	•	Load the security data
#AESENCRYPT	•	•	Encrypt data
#AESDECRYPT	•	•	Decrypt data
#AESGETRESULT	•	•	Result of AES calculation
ECM/RNDIS commands			
#ICMCONNECT	•	•	RNDIS/ECM interface connect in AP side
#ICMLANCFG	•	•	Private IP address for RNDIS/ECM and GW, DHCP address setting

#ICMWANCFG	•	•	WAN configuration for Profile(Cid), Autoconneciton and Roaming
#ICMAUTOCONN	•	•	setup data call for 1 APN or 2 APN automatically for RNDIS/ECM
#VLANLIST	•	•	To add or remove a pair of CID and VLAN ID.
#VLANTAGGED	•	•	To set or read VLAN mode

5. AT Commands References

5.1. Command Line General Format

5.1.1. Command Line Prefixes

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

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 execute 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 does not need a fixed IPR.
Reference	V25ter

5.1.1.3. Repeat Last Command - AT#/

AT#/ – Repeat Last Command	
AT#/	The prefix is used to execute again the last received command

5.2. General Configuration Commands

5.2.1.1. Select Interface Style - #SELINT

AT#SELINT – Select Interface Style	
AT#SELINT=<v>	Set command sets the AT command interface style depending on parameter <v>. Parameter: **<v>** - AT command interface style 2 - switches the AT command interface style of the product, to LE922Ax
AT#SELINT?	Read command reports the current interface style.
AT#SELINT=?	Test command reports the available range of values for parameter **<v>**.

5.2.1.2. Set Notification Port - #NOPT

#NOPT - Set notification port	
AT#NOPT=<num>	Set command specifies the port print out Notification (URC) messages Parameter: **<num>** - Notification Port 0 – All Ports; URC messages are sent to all ports. < default value > 1 – UART Main Port only 2 – Telit USB Modem 1 Port only 3 – Telit USB Modem 2 Port only 4 – Telit USB Auxiliary Port only 5 – Multiplexer DLCI1 Port only 6 – Multiplexer DLCI2 Port only 7 – Multiplexer DLCI3 Port only 8 – Multiplexer DLCI4 Port only 9 – ATRUN SMS Port only 10 – ATRUN TCP Port only 11 – SIMTool Kit Port only 12 – SMDTTY1 Port only 13 – SMDTTY2 Port only Note : URC messages sent out only on the configured ports by this command Note: If the configured port closed, URC messages will be discarded. Note: DTE must enable DTR line to get URC messages on Telit USB ports and SMDTTY ports
AT#NOPT?	Read command reports the current notification port.

#NOPT - Set notification port	
AT#NOPT=?	Test command reports the available range of values for parameter **<num>**.
Example	This command causes to enable URC message only on “USB_MDM1”. AT#NOPT=2 OK

5.2.1.3. Set Notification Port Extension - #NOPTEXT

#NOPTEXT – Notification Port Extension	
AT#NOPTEXT=<noptext_enable>[,<port_enable>[,<port_enable>[,...]]]	Set command specifies the port print out URC messages. This command is extended from AT#NOPT command. Unlike AT#NOPT, this command allow to enable URC message on each port Parameter: **<noptext_enable>** 0 – Disable #NOPTEXT Command Set (default value) 1 – Enable #NOPTEXT Command Set Note: if <noptext_enable> is enable, #NOPT’s setting value ignored and URC message port specified by #NOPTEXT setting value. <port_enable> 0 – enable URC message on the specific port 1 – disable URC message on the specific port
AT#NOPTEXT?	Read command show current <mode> in the following format #NOPTEXT: <noptext_enable>,<port_enable>,<port_enable>,…
AT#NOPTEXT=?	Test command returns the list of supported values in the following format #NOPTEXT: (0,1),(<port_descr>,(0,1)),(<port_descr>,(0,1)),… <port_descr>: 1- “UART_MAIN" 2- "USB_MDM1" 3- “USB_MDM2” 4- “USB_AUX” 5- "CMUX_1" 6- "CMUX_2" 7- "CMUX_3" 8- "CMUX_4" 9- “ATRUN_SMS” 10- “ATRUN_TCP” 11- “SIMTOOLKIT” 12- “SMD_TTY1” 13- “SMD_TTY2”
Example	This command causes to enable URC message only on “UART_MAIN” and “USB_MDM1”. AT#NOPTEXT=1,1,1,0,0,0,0,0,0,0,0,0,0,0

#NOPTEXT – Notification Port Extension	
	OK

5.3. Hayes Compliant AT Commands

5.3.1. Generic Modem Control

5.3.1.1. 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.

5.3.1.2. Soft Reset – Z

Z - Soft Reset	
ATZ[<n>]	Execution command loads the base section of the specified user profile and the extended section of the default factory profile. Parameter: **<n>** 0..1 - user profile number Note: any call in progress will be terminated. Note: if parameter **<n>** is omitted, the command has the same behaviour as **ATZ0**.

5.3.1.3. 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>**

+FCLASS - Select Active Service Class	
	0 – data (default) 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>**.
Reference	3GPP TS 27.007

5.3.1.4. 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 command **&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 start up. Note: if parameter is omitted, the command has the same behaviour as **AT&Y0**

5.3.1.5. 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 start up. 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 start up. Note: if parameter is omitted, the command has the same behaviour as **AT&P0**
Reference	Telit Specifications

5.3.1.6. 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>** 0..1 - profile number: the wireless module is able to store 2 full configurations Note: if parameter is omitted, the command has the same behaviour of **AT&W0**.

5.3.1.7. Store Telephone Number In The Module Internal Phonebook - &Z

&Z - Store Telephone Number In The Wireless Module Internal Phonebook	
AT&Z<n>=<nr>	Execution command stores in the record **<n>** the telephone number **<nr>**. The records cannot be overwritten; they must be cleared before rewriting. Parameters: **<n>** - phonebook record **<nr>** - telephone number (string type) Note: the wireless module has a built in non-volatile memory in which 10 telephone numbers of a maximum 24 digits can be stored Note: to delete the record **<n>** the command **AT&Z<n>=<CR>** must be issued. Note: the records in the module memory can be viewed with the command **&N**, while the telephone number stored in the record ***n*** can be dialled by giving the command **ATDS=<*n*>**.

5.3.1.8. Display Internal Phonebook Stored Numbers - &N

&N - Display Internal Phonebook Stored Numbers	
AT&N[<n>]	Execution command returns the telephone number stored at the **<n>** position in the internal memory. Parameter: **<n>** - phonebook record number Note: if parameter **<n>** is omitted then all the internal records are shown.

5.3.1.9. Manufacturer Identification - +GMI

+GMI - Manufacturer Identification	
AT+GMI	Execution command returns the manufacturer identification.
Reference	V.25ter

5.3.1.10. Model Identification - +GMM

+GMM - Model Identification	
AT+GMM	Execution command returns the model identification.
Reference	V.25ter

5.3.1.11. Revision Identification - +GMR

+GMR - Revision Identification	
AT+GMR	Execution command returns the software revision identification.
Reference	V.25ter

5.3.1.12. Capabilities List - +GCAP

+GCAP - Capabilities List

+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
Reference	V.25ter

5.3.1.13. Serial Number - +GSN

+GSN - Serial Number	
AT+GSN	Execution command returns the device board serial number. Note: The number returned is not the IMSI, it is only the board number
Reference	V.25ter

5.3.1.14. 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.

5.3.1.15. 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.

5.3.1.16. 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

5.3.1.17. 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: **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

5.3.1.18. Display Last Connection Statistics - &V2

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

5.3.1.19. Single Line Connect Message - \V

\V - Single Line Connect Message	
AT\V[<n>]	Execution command set single line connect message. Parameter: **<n>** 0 - off 1 - on Note: if parameter is omitted, the command has the same behaviour of **AT\V0**

5.3.1.20. Country Of Installation - +GCI

+GCI – Country Of Installation	
AT+GCI=<code>	Set command selects the installation country code according to ITU-T.35 Annex A. Parameter: **<code>** 59 – It currently supports only the Italy country code
AT+GCI?	Read command reports the currently selected country code.

+GCI – Country Of Installation	
AT+GCI=?	Test command reports the supported country codes.
Reference	V25ter.

5.3.1.21. Line Signal Level - %L

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

5.3.1.22. Line Quality - %Q

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

5.3.1.23. Speaker Loudness - L

L - Speaker Loudness	
ATL<n>	It has no effect and is included only for backward compatibility with landline modems

5.3.1.24. Speaker Mode - M

M - Speaker Mode	
ATM<n>	It has no effect and is included only for backward compatibility with landline modems

5.3.2. DTE - Modem Interface Control

5.3.2.1. 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. Note: if parameter is omitted, the command has the same behaviour of **ATE0**
Reference	V25ter

5.3.2.2. Quiet Result Codes – Q

Q - Quiet Result Codes	
ATQ[<n>]	Set command enables or disables the result codes.

Q - Quiet 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

5.3.2.3. 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) 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

5.3.2.4. 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

5.3.2.5. Identification Information – I

I - Identification Information	
ATI[<n>]	Execution command returns one or more lines of information text followed by a result code. Parameter: **<n>** 0 - numerical identifier. 1 - module checksum 2 - checksum check result 3 - manufacturer 4 - product name 5 - DOB version Note: if parameter is omitted, the command has the same behaviour of **ATI0**
Reference	V25ter

5.3.2.6. 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. 1 - **DCD** follows the Carrier detect status: if carrier is detected **DCD** is high,

&C - Data Carrier Detect (DCD) Control	
	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: **AT&C** has to be removed from the list of AT command whose parameters are stored in NVM.
Reference	V25ter

5.3.2.7. 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. 3 – device ignores **DTR** transitions. 4 - **C108/1** operation is disabled. 5 - **C108/1** operation is enabled; same behaviour as for <**n**>=**2** Note: if a connection has been set up issuing **#SKTD**, then **AT&D1** has the same effect as **AT&D2**. If a connection has been set up issuing AT#SD then AT&D1 and AT&D2 have different effect, as described above. 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: Recommended that AT&D2 is issued prior to dial-up network service from DTE. If DTR event is ignored, DCE could be stuck in dormant state in a situation that DCE is not able to communicate with NW(like No service) and DTE tries to disconnect dial-up service. If voice is activated with data service simultaneously, refer to AT+CVHU command guide. Note: if parameter is omitted, the command has the same behaviour of **AT&D0**
Reference	V25ter

5.3.2.1. Standard Flow Control - \Q

\Q - Standard Flow Control	
AT\Q[<n>]	Set command controls the RS232 flow control behaviour. Parameter: **<n>** 0 - no flow control

\Q - Standard Flow Control	
	3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default) Note: if parameter is omitted, the command has the same behaviour as **AT\Q0** Note: Hardware flow control (**AT\Q3**) is not active in command mode. Note: **Q**'s settings are functionally a subset of **&K**'s ones.
Reference	V25ter

5.3.2.2. Flow Control - &K

&K - Flow Control	
AT&K[<n>]	Set command controls the RS232 flow control behaviour. Parameter: **<n>** 0 - no flow control 3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default) Note: if parameter is omitted, the command has the same behaviour as **AT&K0** 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.

5.3.2.3. 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** & USB_VBUS pin is always tied Low. Note: if parameter is omitted, the command has the same behaviour of **AT&S0** **Note**: If option 1 or 2 are active, **DSR** will not be tied **High** in case of GSM voice connection.

5.3.2.4. 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**

5.3.2.5. 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. NOTE: DTE speed of USB port is always 0. DTE speed of USB does not change. Parameter: **<rate>** - 300 600 1200 2400 4800 9600 19200 38400 57600 115200 (default) 230400 460800 921600 3200000 3947500 If **<rate>** is specified and not 0, **DTE-DCE** speed is fixed at that speed, hence no speed auto-detection (autobauding) is enabled.
AT+IPR?	Read command returns the current value of **+IPR** parameter.
AT+IPR=?	Test command returns the list of supported autodetectable **<rate>** values and the list of fixed-only **<rate>** values in the format:

+IPR - Fixed DTE Interface Rate	
	+IPR:(list of supported autodetectable **<rate>** values), (list of fixed-only **<rate>** values)
Reference	V25ter

5.3.2.6. 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 2 - **C105** (**RTS**) (factory default) **<by_ta>** - flow control option for the data sent by **modem** 0 - flow control None 2 - **C106** (**CTS**) (factory default) The supported flow control list as follows **<by_te>** / **<by_ta>**: 0/0, 2/2 Note: Software flow control (XON/XOFF) not supported. Only possible commands are AT+IFC=0,0 and AT+IFC=2,2. Note: Hardware flow control (**AT+IFC=2,2**) is not active in command mode. Note: This command is equivalent to **&K** command.
AT+IFC?	Read command returns active flow control settings. Note: If flow control behaviour has been set with **AT&Kn** command with the parameter that is not allowed by **AT+IFC** the read command **AT+IFC?** will return: **+IFC: 0,0**
AT+IFC=?	Test command returns all supported values of the parameters **<by_te>** and **<by_ta>**.
Reference	V25ter

5.3.2.7. 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. 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. 1 - 8 Date, 2 Stop 2 - 8 Data, 1 Parity, 1 Stop 3 - 8 Data, 1 Stop (factory default) 5 - 7 Data, 1 Parity, 1 Stop **<parity>** - determines how the parity bit is generated and checked, if present; setting this sub parameter is mandatory and has a meaning only if **<format>** subparameter is either 2 or 5 otherwise is not allowed. 0 - Odd (not supported) 1 - Even (not supported)
AT+ICF?	Read command returns current settings for sub parameters **<format>** and **<parity>**. If current setting of subparameter **<format>** is neither 2 nor 5, the current setting of subparameter **<parity>** will always be represented as 0.
AT+ICF=?	Test command returns the ranges of values for the parameters **<format>** and **<parity>**
Reference	V25ter
Example	*8N2* AT+ICF=1 OK *8O1* AT+ICF=2,0 OK *8E1* AT+ICF=2,1 OK *8N1* AT+ICF = 3 (default) OK *7O1* AT+ICF=5,0 OK *7E1* AT+ICF=5,1 OK

5.3.3. Call Control

5.3.3.1. Dial – D

D – Dial	
ATD<number>[;]	Execution command starts a call to the phone number given as parameter. If ";" is present, a **voice** call to the given number is performed, regardless of the cur rent value of the connection mode set by **+FCLASS** command. Parameter: **<number>** - phone number to be dialed Note: type of call (**data** or **voice**) depends on last **+FCLASS** setting. Note: the numbers accepted are 0-9 and *,#,"A","B","C","D","+". Note: for backwards compatibility with landline modems modifiers "T", "P", "R", " ,", "W", "!", "@" are accepted but have no effect
ATD><str>[;]	Issues a call to phone number which corresponding alphanumeric field is **<str>**; all available memories will be searched for the correct entry. If ";" is present a **voice** call is performed. Parameter: **<str>** - alphanumeric field corresponding to phone number. it must be enclosed in q uotation marks. Note: parameter **<str>** is case sensitive. Note: used character set should be the one selected with **+CSCS**.
ATD><mem><n>[;]	Issues a call to phone number in phonebook memory storage **<mem>**, entry locatio n **<n>** (available memories may be queried with **AT+CPBS=?**). If "**;**" is present a **voice** call is performed. Parameters: **<mem>** - phonebook memory storage; "SM" - SIM/UICC phonebook "FD" - SIM/USIM fixed dialing phonebook "LD" - SIM/UICC last dialing phonebook "MC" – missed calls list "RC" - Received calls list "DC" - MT dialled calls list "ME" - MT phonebook "EN" - SIM/USIM (or MT) emergency number(+CPBW is not be applicable for thi s storage) "ON" - SIM (or MT) own numbers (MSI torage may be available through +CNUM also). "MB" - mailbox numbers stored on SIM. if this service is provided by the SIM (see **#MBN**). **<n>** - entry location; it should be in the range of locations available in the memory used

D – Dial	
ATD><n>[;]	Issues a call to a phone number on entry location <n> of the active phonebook mem ory storage (see +CPBS). If ";" is present a voice call is performed. Parameter: <**n**> - active phonebook memory storage entry location; it should be in the range of locations available in the active phonebook memory storage.
ATDL	Issues a call to the last number dialed.
ATDS=<nr>[;]	Issues a call to the number stored in the MODULE internal phonebook position nu mber <**nr**>. If ";" is present a voice call is performed. Parameter: <**nr**> - internal phonebook position to be called (See commands **&N** and **&Z**)
ATD<number>I[;] **ATD<number>i[;]**	Issues a call overwriting the CLIR supplementary service subscription default value for this call If "**;**" is present a voice call is performed. I - invocation, restrict CLI presentation i - suppression, allow CLI presentation
ATD<number>G[;] **ATD<number>g[;]**	Issues a call checking the CUG supplementary service information for the current call. Refer to **+CCUG** command. If "**;**" is present a **voice** call is performed.
ATD*<gprs_sc>[*<addr>][*[<L2P>][*[<cid>]]]]#	This command is specific of GPRS functionality and causes the **MT** to perform whatever actions are necessary to establish communication between the **TE** and the external PDN. Parameters: **<gprs_sc>** - GPRS Service Code, a digit string (value 99) which identifies a request to use the GPRS **<addr>** - string that identifies the called party in the address space applicable to the PDP. **<L2P>** - a string which indicates the layer 2 protocol to be used. For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used: 1 - PPP **<cid>** - a digit which specifies a particular **PDP** context definition (see **+CGDCONT** command).
Example	*To dial a number in SIM phonebook entry 6:* ATD>SM6 OK *To have a voice call to the 6-th entry of active phonebook:* ATD>6; OK *To call the entry with alphanumeric field "Name":*

D – Dial	
	ATD>”Name”; OK
Reference	V25ter.

5.3.3.2. Tone Dial - T

T - Tone Dial	
ATT	Set command has no effect is included only for backward compatibility with landline modems.
Reference	V25ter.

5.3.3.3. Pulse Dial - P

P - Pulse Dial	
ATP	Set command has no effect is included only for backward compatibility with landline modems.
Reference	V25ter.

5.3.3.4. Answer – A

A – Answer	
ATA	Execution command is used to answer to an incoming call if automatic answer is disabled. Note: This command MUST be the last in the command line and must be followed immediately by a <**CR**> character.
Reference	V25ter.

5.3.3.5. Disconnect – H

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

5.3.3.6. Return To On Line Mode – O

O – Return To On Line Mode	
ATO	Execution command is used to return to on-line mode from command mode. If there's no active connection, it returns **NO CARRIER**. Note: After issuing this command, if the device is in conversation, to send other commands to the device you must return to command mode by issuing the escape sequence (see **register S2**) or tying low **DTR** pin if **&D1** option is active.

O – Return To On Line Mode	
Reference	V25ter.

5.3.4. Modulation Control

5.3.4.1. 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.

5.3.5. Compression Control

5.3.5.1. Data Compression - +DS

+DS – Data Compression	
AT+DS=[<n>]	Set command sets the V42 compression parameter. Parameter: **<n>** 0 – no compression, it is currently the only supported value; the command has no effect, and is included only for backward compatibility
AT+DS?	Read command returns current value of the data compression parameter.
AT+DS=?	Test command returns all supported values of the parameter **<n>**
Reference	V25ter

5.3.5.2. Data Compression Reporting - +DR

+DR - Data Compression Reporting	
AT+DR=<n>	Set command enables/disables the data compression reporting upon connection. Parameter: **<n>** 0 - data compression reporting disabled;(default) 1 - data compression reporting enabled upon connection. Note: if enabled, the following intermediate result code is transmitted before the final result code: **+DR: <compression>** (the only supported value for <**compression**> is "**NONE**")
AT+DR?	Read command returns current value of **<n>**.
AT+DR=?	Test command returns all supported values of the parameter **<n>**
Reference	V25ter

5.3.6. 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 sub parameter of an **S-Parameter**, an **ERROR** result code will be issued and the stored value left unchanged.

Reference: V25ter

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

1) **AT=<value><CR>** sets the contents of the last S-paramter accessed with ATSn=<value> command (default: S0)

Example:
AT=40<CR> sets the content of S0 to 40

2) **AT?** returns the current value of the last S-parameter accessed with ATSn=<value> command (default: S0)

5.3.6.1. 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

5.3.6.2. Ring Counter - S1

S1 - Ring Counter	
ATS1	**S1** is incremented each time the device detects the ring signal of an incoming call. **S1** is cleared as soon as no ring occurs. Note: the form **ATS1** has no effect.
ATS1?	Read command returns the value of this parameter.

5.3.6.3. Escape Character - S2

S2 - Escape Character	
ATS2=<char>	Set command sets the ASCII character to be used as escape character. Parameter: **<char>** - escape character decimal ASCII 0..255 - factory default value is 43 (+). Note: the escape sequence consists of three escape characters preceded and followed by ***n*** ms of idle (see **S12** to set ***n***).
ATS2?	Read command returns the current value of **S2** parameter. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.3.6.4. Command Line Termination Character - S3

S3 - Command Line Termination Character	
ATS3=<char>	Set command sets the value of the character either recognized by the device as command line terminator or generated by the device as part of the header, trailer, and terminator for result codes and information text, along with **S4 parameter**. Parameter: **<char>** - command line termination character (decimal ASCII)

S3 - Command Line Termination Character	
	0..127 - factory default value is 13 (ASCII **<CR>**) Note: the "previous" value of **S3** is used to determine the command line termination character for entering the command line containing the **S3** setting command. However the result code issued shall use the "new" value of **S3** (as set during the processing of the command line)
ATS3?	Read command returns the current value of **S3 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.5. Response Formatting Character - S4

S4 - Response Formatting Character	
ATS4=<char>	Set command sets the value of the character generated by the device as part of the header, trailer, and terminator for result codes and information text, along with the **S3 parameter**. Parameter: **<char>** - response formatting character (decimal ASCII) 0..127 - factory default value is 10 (ASCII **LF**) Note: if the value of **S4** is changed in a command line the result code issued in response of that command line will use the new value of **S4**.
ATS4?	Read command returns the current value of S4 parameter. Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.6. Command Line Editing Character - S5

S5 - Command Line Editing Character	
ATS5=<char>	Set command sets the value of the character recognized by the device as a request to delete from the command line the immediately preceding character. Parameter: **<char>** - command line editing character (decimal ASCII) 0..127 - factory default value is 8 (ASCII **BS**)
ATS5?	Read command returns the current value of **S5 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.7. Connection Completion Time-Out - S7

S7 - Connection Completion Time-Out	
ATS7=<tout>	Set command sets the amount of time, in seconds, that the device shall allow between either answering a call (automatically or by **A** command) or completion of

S7 - Connection Completion Time-Out	
	signalling of call addressing information to network (dialling), and establishment of a connection with the remote device. Parameter: **<tout>** - number of seconds 1..255 - factory default value is 60
ATS7?	Read command returns the current value of **S7 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.8. Carrier Off With Firm Time - S10

S10 –Carrier Off With Firm Time	
ATS10	Execution command has no effect and is included only for backward compatibility with landline modems

5.3.6.9. Escape Prompt Delay - S12

S12 - Escape Prompt Delay	
ATS12=<time>	Set command sets: 1) the minimum period, before receipt of the first character of the three escape character sequence, during which no other character has to be detected in order to accept it as valid first character; 2) the maximum period allowed between receipt of first or second character of the three escape character sequence and receipt of the next; 3) the minimum period, after receipt of the last character of the three escape character sequence, during which no other character has to be detected in order to accept the escape sequence as a valid one. Parameter: **<time>** - expressed in fiftieth of a second 20..255 - factory default value is 50. Note: the minimum period **S12** has to pass after **CONNECT** result code too, before a received character is accepted as valid first character of the three escape character sequence.
ATS12?	Read command returns the current value of **S12 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.3.6.10. Delay To DTR Off - S25

S25 -Delay To DTR Off	
ATS25=<time>	Set command defines the amount of time, in hundredths of second, that the device will ignore the **DTR** for taking the action specified by command **&D**. Parameter:

S25 -Delay To DTR Off	
	<time> - expressed in hundredths of a second 0..255 - factory default value is 5. Note: the delay is effective only if its value is greater than 5.
ATS25?	Read command returns the current value of **S25 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.3.6.11. Disconnect Inactivity Timer – S30

S30 -Disconnect Inactivity Timer	
ATS30=<tout>	Set command defines the inactivity time-out in minutes. The device disconnects if no characters are exchanged for a time period of at least **<tout>** minutes. Parameter: **<tout>** - expressed in minutes 0 - disabled, disconnection due to inactivity is disabled (factory default). 1..127 - inactivity time-out value
ATS30?	Read command returns the current value of **S30 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.3.6.12. Delay Before Forced Hang Up – S38

S38 -Delay To Before Forced Hang Up	
ATS38=<delay>	Set command has no effect and it included only for backward compatibility. Parameter: **<delay>** - expressed in seconds 0..255 - factory default value is 0.
ATS38?	Read command returns the current value of **S38 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.4. 3GPP TS 27.007 AT Commands

5.4.1. General

5.4.1.1. 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

5.4.1.2. 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

5.4.1.3. 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

5.4.1.4. 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

5.4.1.5. 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 default alphabet (3GPP TS 23.038) “IRA” - international reference alphabet (ITU-T T.50)

+CSCS - Select TE Character Set	
	"8859-1" - ISO 8859 Latin 1 character set "PCCP437" - PC character set Code Page 437 "UCS2" - 16-bit universal multiple-octet coded character set (ISO/IEC10646)
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

5.4.1.6. 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

5.4.1.7. Multiplexing Mode - +CMUX

+CMUX - Multiplexing Mode	
AT+CMUX= <mode> [,<subset>]	Set command is used to enable/disable the GSM 07.10 multiplexing protocol control channel. Parameters: **<mode>** multiplexer transparency mechanism 0 - basic option; it is currently the only supported value. **<subset>** 0 - UIH frames used only; it is currently the only supported value. Note: after entering the ***Multiplexed Mode*** an inactive timer of five seconds starts. If no CMUX control channel is established before this inactivity timer expires the engine returns to ***AT Command Mode*** Note: all the CMUX protocol parameter are fixed as defined in GSM07.10 and cannot be changed. Note: the maximum frame size is fixed: **N1=128**
AT+CMUX?	Read command returns the current value of **<mode>** and **<subset>** parameters, in the format: **+CMUX: <mode>,<subset>**
AT+CMUX=?	Test command returns the range of supported values for parameters **<mode>** and **<subset>**.
Reference	GSM 07.07, GSM 07.10

5.4.1.8. 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.

5.4.2. Call Control

5.4.2.1. Hang Up Call - +CHUP

+CHUP - Hang Up Call	
AT+CHUP	Execution command cancels all active and held calls, also if a multi-party session is running.
AT+CHUP=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.2.2. Select type of address - +CSTA

+CSTA – Select type of address	
AT+CSTA=[<type>]	Set command selects the type of number for further dialing commands (D) according to GSM/UMTS specifications.

+CSTA – Select type of address	
	Parameter: **<type>:** type of address octet in integer format (refer TS 24.008 subclause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129
AT+CSTA?	Read command returns selected **<type>** **+CSTA: <type>**
AT+CSTA=?	Test command returns supported **<type>**

5.4.2.3. 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 PS attach or unsuccessful PDP context activation - The last PS 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

5.4.2.4. 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:

+CRC – Cellular Result Codes	
	ASYNC - asynchronous transparent data SYNC - synchronous transparent data REL ASYNC - asynchronous non-transparent data REL SYNC - synchronous non-transparent data VOICE - normal voice (TS 11) Note: LE922A6-A1/LE922A6-E1 does not support CSD.
AT+CRC?	Read command returns current value of the parameter <mode>.
AT+CRC=?	Test command returns supported values of the parameter <mode>.
Reference	3GPP TS 27.007

5.4.2.5. Single Numbering Scheme - +CSNS

+CSNS – Single Numbering Scheme	
AT+CSNS=[<mode>]	Set command selects the bearer to be used when mobile terminated single numbering scheme call is established. Parameter values set with **+CBST** command shall be used when **<mode>** equals to a data service. Parameter: **<mode>** 0 - voice (factory default) 4 – data (not applicable) Note: LE922A6-A1/LE922A6-E1 does not support CSD. Thererfore, **+CBST** should not be supported.
AT+CSNS?	Read command returns current value of the parameter **<mode>**
AT+CSNS=?	Test command returns supported values of parameter **<mode>**
Reference	3GPP TS 27.007

5.4.2.6. 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>**

5.4.3. Network Service Handling

5.4.3.1. 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

5.4.3.2. 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 alpha numeric format(see +**COPS**)
AT+COPN=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

5.4.3.3. 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)

+CREG – Network Registration Report	
	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],[<AcT>]]** **Where:** **<lac>:** string type; two byte location area code (when <Act> indicates value 0 to 6), or tracking area code (when <AcT> indicates value 7). In hexadecimal format<ci>: string type; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format. **<Act> :** integer type; access technology of the serving cell 0 GSM 2 UTRAN 3 GSM w/EGPRS 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA 7 E-UTRAN **Note: <Lac>,<Ci> and <Act>** are reported only if **<mode>=2** and the mobile is registered on some network cell. **Note:** 4G/3G only products like LE922A6-A1 does not support GSM access technology**.** **Note:** 4G only products like LE922A6-E1 does not support GSM and UTRA access technology**.**
AT+CREG?	Read command reports the **<mode>** and **<stat>** parameter values in the format: **+CREG: <mode>,<stat>[<Lac>,<Ci>,<Act>]** **Note: <Lac>,<Ci> and <Act>** 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

+CREG – Network Registration Report	
	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: 0,1 OK *(the MODULE is registered)* at+creg? +CREG: 0,1 OK
Reference	3GPP TS 27.007

5.4.3.4. EPS – Network Registration status +CEREG

+CEREG – EPS Network Registration Status	
AT+CEREG=[<n>]	The Set command controls the presentation of an unsolicited result code. **+CEREG: (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 EPS network registration status, it is issued the unsolicited result code: **+CEREG: <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

+CEREG – EPS Network Registration Status	
	3 - registration denied 4 - unknown(e.g. out of E-UTRAN coverage). 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: **+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]** where: **<stat>** - registration status (see above for values) **<tac>** - two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>** - four byte E-UTRAN cell ID in hexadecimal format. **<AcT>**: access technology of the registered network: 0 - GSM (not applicable) 1 - GSM Compact (not applicable) 2 - UTRAN (not applicable) 3 - GSM w/EGPRS (see NOTE 2) (not applicable) 4 - UTRAN w/HSDPA (see NOTE 3) (not applicable) 5 - UTRAN w/HSUPA (see NOTE 3) (not applicable) 6 - UTRAN w/HSDPA and HSUPA (see NOTE 3) (not applicable) 7 - E-UTRAN **Note**: **<tac>, <Ci>** and **<AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell. **Note 2:** 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. **Note 3:** 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
AT+CEREG?	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: **+CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]]** Note: **<tac>, <Ci>** and **<AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CEREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

5.4.3.5. Operator Selection - +COPS

+COPS – Operator Selection	
AT+COPS=[<mode>[,<format>[,<oper>[,<AcT>]]]]	Set command forces an attempt to select and register the 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	
	Parameter: **<mode>** 0 - automatic choice (the parameter <oper> will be ignored)(factory default) 1 - manual choice(<oper>field shall be present) 2 - deregister from the network; the MODULE is kept unregistered until a +COPS with <mode>=0,1 or 4 is issued 3 - set only <format> parameter (the parameter <oper> will be ignored) 4 - manual/automatic(<oper> field shall be present); if manual selection fails, automatic mode(<mode>=0) is entered **<format>** 0 - alphanumeric long form (max length 16 digits) 1 - short format alphanumeric <oper> 2 - numeric <oper> **<oper>:** network operator in format defined by <format> parameter. **<AcT>:** access technology selected 0 - GSM 2 - UTRAN 7 - E-UTRAN **Note:** <mode> parameter setting is stored in NVM and available at next reboot, if it is not 3 (i.e.: set only <format> parameter). **Note:** if <mode>=1 or 4, the selected network is stored in NVM too and is available at next reboot (this will happen even with a new SIM inserted) **Note:** <format> parameter setting is never stored in NVM **Note:** 4G/3G only products like LE922A6-A1 does not support GSM access technology**.** **Note:** 4G only products like LE922A6-E1 does not support GSM and UTRA access technology**.**
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>]** **where:** **<AcT>:** access technology selected 0 - GSM 2 - UTRAN 3 - GSM w/EGPRS 4 - UTRAN w/HSDPA 5 - UTRAN w/HSUPA 6 - UTRAN w/HSDPA and HSUPA 7 - E-UTRAN
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 – Operator Selection	
	+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 2 - UTRAN 7 - E-UTRAN **Note:** once the command done with network scan, 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

5.4.3.6. PCCA STD-101 Select Wireless Network - +WS46

+WS46 – PCCA STD-101 Select Wireless Network	
AT+WS46=[<n>]	Set command selects the cellular network (Wireless Data Service, WDS) to operate with the **TA** (WDS-Side Stack Selection). **Parameter:** **<n>** - integer type, it is the WDS-Side Stack used by the **TA**. 12 GSM Digital Cellular Systems (GERAN only) 22 UTRAN only 25 3GPP Systems (GERAN and UTRAN and E-UTRAN) 28 E-UTRAN only 29 GERAN and UTRAN 30 GERAN and E-UTRAN 31 UTRAN and E-UTRAN **Note:** The values in <n> for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned. **Note:** <n> parameter setting is stored in NVM and available at next reboot.

+WS46 – PCCA STD-101 Select Wireless Network	
	Note: 4G/3G only products like LE922A6-A1 support **<n>** parameter values 22, 28 and 31 only. 31 is factory default. **Note:** 4G only products like LE922A6-E1 support **<n>** parameter value 28 only.
AT+WS46?	Read command reports the currently selected cellular network, in the format: **+ WS46: <n>**
AT+WS46=?	Test command reports the range for the parameter **<n>**.
Reference	3GPP TS 27.007

5.4.3.7. Facility Lock/Unlock - +CLCK

+CLCK - Facility Lock/Unlock	
AT+CLCK= **<fac>,<mode>** **[,<passwd>** **[,<class>]]**	Execution command is used to lock or unlock a **ME** on a network facility. Parameters: **<fac>** - facility "SC" - SIM (PIN request) (device asks SIM password at power-up and when this lock command 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 (applicable only for **<mode>=0**) "AG" - All outGoing barring services (applicable only for **<mode>=0**) (not yet supported) "AC" - All inComing barring services (applicable only for **<mode>=0**) "FD" - SIM fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as **<passwd>**) "PN" - network Personalisation "PU" - network subset Personalisation "PP" - service Provider Personalization "PC" - Corporate Personalization "PF" - lock Phone to the very First inserted SIM card (MT asks password when other than the first SIM card is inserted) **<mode>** - defines the operation to be done on the facility 0 - unlock facility 1 - lock facility 2 - query status **<passwd>** - shall be the same as password specified for the facility from the **DTE** user interface or with command Change Password **+CPWD** **<class>** - sum of integers each representing a class of information (default is 7) 1 - voice (telephony) 2 - data (refers to all bearer services) 4 - fax (facsimile services) 8 - short message service

+CLCK - Facility Lock/Unlock	
	16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access Note: when **<mode>=2** and command successful, it returns: **+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 Note: 4G only products like LE922A6-E1 does not support a network facility related with voice.
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

5.4.3.8. Change Facility Password - +CPWD

+CPWD - Change Facility Password	
AT+CPWD=<fac>, <oldpwd>, <newpwd>	Execution command changes the password for the facility lock function defined by command Facility Lock **+CLCK**. Parameters: **<fac>** - facility "AB" - All Barring services (applicable only for **<mode>=0**) "AC" - All inComing barring services (applicable only for **<mode>=0**) "AG" - All outGoing barring services (applicable only for **<mode>=0**) "AI" - BAIC (Barr All Incoming Calls) "AO" - BAOC (Barr All Outgoing Calls) "IR" - BIC-Roam (Barr Incoming Calls When Roaming outside the home country) "OI" - BOIC (Barr Outgoing International Calls) "OX" - BOIC-exHC (Barr Outgoing International Calls except to Home Country)

+CPWD - Change Facility Password	
	"SC" - SIM (PIN request) "P2" - SIM PIN2 "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) **<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>**)
Reference	3GPP TS 27.007
Example	AT+CPWD=? +CPWD: ("AB",4), ("AC",4), ("AG",4), ("AI",4), ("AO",4), ("IR",4), ("OI",4), ("OX",4), ("SC",8), ("P2",8),("PN",16),("PU",16),("PP",16), ("PC",16),("PF",16) OK

5.4.3.9. 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 When **<n>**=1, the device reports the presentation of the calling line identity after each RING in the format: **+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

+CLIP – Calling Line Identification Presentation	
	128..255 - refer TS 24.008 subclause 10.5.4.7, where: 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. Note: the **+CLIP:** response isn't currently reported both 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 values supported **<n>**.
Reference	3GPP TS 27.007
Note	This command changes only the report behaviour of the device, it does not change CLI supplementary service setting on the network.

5.4.3.10. 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 (factory default)

+CLIR – Calling Line Identification Restriction	
	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 (given in <**n**>) and also triggers an interrogation of the provision status of the CLIR service (given in <**m**>) in the format: **+CLIR: <n>,<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 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 befaviour of the device in outgoing calls.

5.4.3.11. Connected line identification presentation – COLP

+COLP – Connected Line Identification presentation	
AT+COLP=[<n>]	This command refers to the GSM/UMTS supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network. Parameters: **<n>** 0 - disables COL indication (factory default) 1 - enables COL indication When enabled (and called subscriber allows), **+COLP: <number>,<type>** intermediate result code is returned from TA to TE before any +CR or ITU-T Recommendation V.250 responses, where **<number>** - string type phone number of format specified by <type> **<type>** - type of address octet in integer format 129 - unknown type of number and ISDN/Telephony numbering plan

+COLP – Connected Line Identification presentation	
	145 - international type of number and ISDN/Telephony numbering plan (contains the character "+") Note: if COL information is needed, it is recommended to set DIALMODE to 1 (see AT#DIALMODE command), in order to have network information available for display before returning to command mode.
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 (given in <m>) in the format: **+COLP: <n>,<m>** where: **<n>** 0 - COL presentation disabled 1 - COL presentation enabled **<m>** - status of the COLP service on the network 0 - COLP not provisioned 1 - COLP 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+COLP=?	Test command reports the range for the parameter **<n>**.

5.4.3.12. Connected line identification restriction status - +COLR

+COLR – Connected Line Identification Restriction status	
AT+COLR	This command refers to the GSM/UMTS supplementary service COLR (Connected Line Identification Restriction) that enables a called subscriber to restrict the possibility of presentation of connected line identity (COL) to the calling party after receiving a mobile terminated call. The command displays the status of the COL presentation in the network. It has no effect on the execution of the supplementary service COLR in the network. Execution command triggers an interrogation of the activation status of the COLR service according 3GPP TS 22.081 (given in <m>): **+COLR**: <**m**> where: <**m**>: integer type (parameter shows the subscriber COLR service status in the network) 0 - COLR not provisioned 1 - COLR provisioned 2 - unknown (e.g. no network, etc.) Activation, deactivation, registration and erasure of the supplementary service COLR are not applicable.

+COLR – Connected Line Identification Restriction status	
AT+COLR=?	Test command tests for command existence.

5.4.3.13. 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>** 0 – unconditional 1 – mobile busy 2 – no reply 3 – not reachable 4 – all calls (not with query command) 5 – all conditional calls (not with query command) **<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 – Call Forwarding Number And Condition	
	+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. Note: The value 4 (facsimile services) of <class> has no effect because FAX does not support. This value is included only for backward compatibility.
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>**..

5.4.3.14. 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 (factory default) 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 – Call Waiting	
	+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**> <**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.. Note: The value 4 (facsimile services) of <class> has no effect because FAX does not support. This value is included only for backward compatibility.
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

5.4.3.15. Call Holding Services - +CHLD

+CHLD – Call Holding Services	
AT+CHLD=[<n>]	Execution command controls the network call hold service. With this service it is possible to disconnect temporarily a call and keep it suspended while it is retained by the network, contemporary it is possible to connect another party or make a multiparty connection. Parameter: **<n>** 0 - releases all held calls, or sets the UDUB (User Determined User Busy) indication for a waiting call. (only from version D) 1 - releases all active calls (if any exist), and accepts the other (held or waiting) call 1X - releases a specific active call X 2 - places all active calls (if any exist) on hold and accepts the other (held or waiting) call. 2X - places all active calls on hold except call X with which communication shall be supported (only from version D). 3 - adds an held call to the conversation 4 - connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer (ECT)) Note: "X" is the numbering (starting with 1) of the call given by the sequence of setting up or receiving the calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released. New calls take the lowest available number. Note: where both a held and a waiting call exist, the above procedures apply to the waiting call (i.e. not to the held call) in conflicting situation.
AT+CHLD=?	Test command returns the list of supported **<n>**s. **+CHLD: (0,1,1X,2,2X,3,4)**
Reference	3GPP TS 27.007
Note	ONLY for VOICE calls

5.4.3.16. Call deflection - +CTFR

+CTFR – Call deflection	
AT+CTFR=<number>[,<type>[,<subaddr>[,<satype>]]]	Set command is used to request a service that causes an incoming alerting call to be forwarded to a specified number. This is based on the GSM/UMTS supplementary service CD (Call Deflection; refer 3GPP TS 22.072). Parameters: <**number**> - string type phone number of format specified by <type>. <**type**> - type of address octet in integer format; default 145 when dialling string includes international access code character "+", otherwise 129 <**subaddr**> - string type subaddress of format specified by <satype> <**satype**> - type of subaddress octet in integer format (refer 3GPP TS 24.008 [8]

+CTFR – Call deflection	
	subclause 10.5.4.8); default 128 Note: Call Deflection is only applicable to an incoming voice call
AT+CTFR=?	Test command tests for command existence.

5.4.3.17. 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 22.090). Parameters: **<n>** - used to disable/enable the presentation of an unsolicited result code. 0 - disable the result code presentation in the **DTA** (factory default) 1 - enable the result code presentation in the **DTA** 2 - cancel an ongoing USSD session (not applicable to read command response) **<str>** - USSD-string (when **<str>** parameter is not given, network is not interrogated) If **<dcs>** indicates that 3GPP TS 3.38/23.038 default alphabet is used **ME/TA** converts GSM alphabet into current TE character set (see **+CSCS**). If **<dcs>** indicates that 8-bit data coding scheme is used: **ME/TA** converts each 8-bit octet into two IRA character long hexadecimal number; e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65). **<dcs>** - 3GPP TS 3.38/23.038 Cell Broadcast Data Coding Scheme in integer format (default 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

5.4.3.18. 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 (factory default) 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) Note: the unsolicited result code **+CCCM** is sent when the CCM value changes, but not more than every 10 seconds.
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.

5.4.3.19. 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>[<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[…]]]** where: **<id*n*>** - call identification number **<dir>** - call direction 0 - mobile originated call 1 - mobile terminated call **<stat>** - state of the call 0 - active

+CLCC – List Current Calls	
	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 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 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 **+CSCS**. 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

5.4.3.20. 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 (factory default) 1 - enable **<m>** - sets the +CSSU result code presentation status 0 - disable (factory default) 1 - enable When **<n>**=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code: **+CSSI: <code1>** is sent to TE before any other MO call setup result codes, where: **<code1>**: 0 - unconditional call forwarding is active

+CSSN – SS Notification	
	1 - some of the conditional call forwardings are active 2 - call has been forwarded 3 - call is waiting 5 - outgoing calls are barred 6 - incoming calls are barred 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>** is sent to TE, where: **<code2>**: 0 - this is a forwarded call (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) 10 - Additional incoming call forwarded.
AT+CSSN?	Read command reports the current value of the parameters.
AT+CSSN=?	Test command returns the supported range of values for parameters **<n>,<m>**
Reference	3GPP TS 27.007

5.4.3.21. 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) (default) **<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

5.4.3.22. Preferred Operator List - +CPOL

+CPOL – Preferred Operator List	
AT+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>, <GSM_Compact_AcT>, <UTRAN_AcT>, <EUTRAN_AcT>]]]	Execution command writes an entry in the SIM list of preferred operators. **Parameters:** **<index>** - integer type; the order number of operator in the SIM preferred operator list 1..*n* **<format>** 0 – long format alphanumeric <**oper**> 1 – short format alphanumeric <**oper**> 2 – numeric <**oper**> **<oper>** - string type **<GSM_AcT>** - GSM access technology 0 – access technology not selected 1 – access technology selected **<GSM_Compact_AcT>** - GSM compact access technology 0 – access technology not selected 1 – access technology selected **<UTRA_AcT>** - UTRA access technology 0 – access technology not selected 1 – access technology selected **<E-UTRAN_AcT*n*>** - E-UTRAN access technology: 0 – access technology not selected 1 – access technology selected **Note:** if **<index>** given but **<oper>** left out, the entry deleted. If **<oper>** given but **<index>** left out, **<oper>** put in the next free location. If only **<format>** given, the format of the **<oper>** in the read command changes. Currently **<GSM_Compact_AcT>** not supported but set value is acceptable. **Note:** 4G/3G only products like LE922A6-A1 does not support GSM access technology**.** **Note:** 4G only products like LE922A6-E1 does not support GSM and UTRA access technology**.**
AT+CPOL?	Read command returns all used entries from the SIM list of preferred operators.
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

5.4.3.23. Selection of preferred PLMN list – +CPLS

+CPLS – Selection of preferred PLMN list

+CPLS – Selection of preferred PLMN list	
AT+CPLS=<list>	The execution command is used to select a list of preferred PLMNs in the SIM/USIM. **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 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

5.4.3.24. Called line identification presentation - +CDIP

+CDIP – Called line identification presentation	
AT+CDIP=[<n>]	This command related to a network service that provides "multiple called numbers (called line identifications) service" to an MT. This command enables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call. Set command enables or disables the presentation of the called line identifications at the TE. When the presentation of the called line identification at the TE is enabled, **+CDIP:<number>,<type>[,<subaddr>,<satype>]** response is returned after every **RING** (or **+CRING: <type>**; refer subclause "Cellular result codes +CRC") result code sent from TA to TE. It is manufacturer specific if this response is used when normal voice call is answered. **<n>** - parameter sets/shows the result code presentation status to the TE. 0 – disable (factory default) 1 – enable **<number>** - string type phone number of format specified by <type> **<type>** - type of address octet in integer format (refer 3GPP TS 24.008 subclause 10.5.4.7) **<subaddr>** - string type subaddress of format specified by <satype> **<satype>** - type of subaddress octet in integer format (refer 3GPP TS 24.008 subclause 10.5.4.8)
AT+CDIP?	Read command gives the status of **<n>** and also triggers an interrogation of the provision status of the "multiple called numbers" service. **+CDIP: <n>,<m>** **<n>** - parameter sets/shows the result code presentation status to the TE. 0 – disable 1 – enable

+CDIP – Called line identification presentation	
	<m> - parameter shows the subscriber "multiple called numbers" service status in the network. 0 - "multiple called numbers service" is not provisioned 1 - "multiple called numbers service" is provisioned 2 - unknown (e.g. no network, etc.)
AT+CDIP=?	Test command returns the supported range of values for parameter **<n>**.

5.4.4. Mobile Equipment Control

5.4.4.1. 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) Note: '1' and '2' at <pas> is not supported.
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

5.4.4.2. 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 - minimum functionality, NON-CYCLIC SLEEP mode: in this mode, the AT interface is not accessible. Consequently, once you have set **<fun>** level 0, do not send further characters. Otherwise these characters remain in the input buffer and may delay the output of an unsolicited result code. The first wake-up event stops power saving and takes the ME back to full functionality level **<fun>=1**. 1 - mobile full functionality with power saving disabled (factory default) 4 - disable both TX and RX 5 - mobile full functionality with power saving enabled **<rst>** - reset flag 0 - do not reset the ME before setting it to **<fun>** functionality level Note: URCs and network behavior (incoming calls or SMS with +CNMI activated) can wake up from CFUN=0 only (there is no way to wake up by TE - RTS not supportted). Note: issuing **AT+CFUN=4[,0]** actually causes the module to perform either a network deregistration and a SIM deactivation. Note: if power saving enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity. Note: to place the module in power saving mode, set the **<fun>** parameter at value = 5 and the line **DTR** (RS232) must be set to **OFF**. Once in power saving, the **CTS** line switch to the **OFF** status to signal that the module is really in power saving condition. During the power saving condition, before sending any **AT** command on the serial line, the **DTR** must be enabled and it must be waited for the **CTS** (RS232) line to go in **ON** status. Until the **DTR** line is **ON**, the module will not return back in the power saving condition. Note: the power saving function does not affect the network behavior of the MODULE, even during the power save condition the module remains registered on the network and reachable for incoming calls or SMS. If a call incomes during the power save, then the module will wake up and proceed normally with the unsolicited incoming call code with CFUN mode 0, and with CFUN mode 5, the unsolicited message are stored in Tx-buffer on Main UART and USB until DTR line is ON.
AT+CFUN?	Read command reports the current setting of **<fun>**.

+CFUN - Set Phone Functionality	
AT+CFUN=?	Test command returns the list of supported values for <**fun**> and <**rst**>.
Reference	3GPP TS 27.007

5.4.4.3. 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. The command may be used to change the SIM PIN by sending it with both parameters <**pin**> and <**newpin**> when PIN request is pending; if no PIN request is pending the command will return an error code and to change the PIN the command **+CPWD** must be used instead. Parameters: <**pin**> - string type value <**newpin**> - string type value. To check the status of the PIN request use the command **AT+CPIN?**
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

+CPIN - Enter PIN	
	PH-CORP PIN - ME is waiting corporate personalization password to be given PH-CORP PUK - ME is waiting corporate personalization unblocking password to 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>**
AT+CPIN=?	Test command returns **OK** result code.
Example	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
Reference	3GPP TS 27.007

5.4.4.4. 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 Note: In GSM, the received signal strength indication is the average of the received signal level measurement samples in dBm, taken on a channel within the reporting period of length one SACCH multi frame, and is mapped as above. For UMTS, the current radio signal strength indicates CPICH RSCP in levels. According to specification 3GPP TS25.133 the range is from 0 to 91, with 0 less than (-115) dBm 1 (-115) dBm...(-114) dBm . . . 91 (-25) dBm or greater 99 - not known or not detectable Values between -115dbm and -120dbm will all be represented by level 0 To be compliant with 3GPP specification, the above values are mapped to range 0...31: Level Scaled (displayed) RSSI 3 or less 0 4...65 Level /2 - 1 66...98 31

+CSQ - Signal Quality	
	99 99 Note: For LTE, refer to the +CESQ command.
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, ETSI 07.07 requires the Test command to be defined.
Reference	3GPP TS 27.007

5.4.4.5. Indicator Control - +CIND

+CIND - Indicator Control	
AT+CIND= **[<state>** **[,<state>[,…]]]**	Set command is used to control the registration state of ME indicators, in order to automatically send the **+CIEV** URC, whenever the value of the associated indicator changes. The supported indicators (**<descr>**) and their order appear from test command **AT+CIND=?** Parameter: **<state>** - registration state 0 - the indicator is deregistered; there's no unsolicited result code (**+CIEV** URC) automatically sent by the ME to the application, whenever the value of the associated indicator changes; the value can be directly queried with **+CIND?** 1 - the indicator is registered: an unsolicited result code (**+CIEV** URC) is automatically sent by the ME to the application, whenever the value of the associated indicator changes; it is still possible to query the value through **+CIND?** (default)
AT+CIND?	Read command returns the current value of ME indicators, in the format: **+CIND: <ind>[,<ind>[,…]]** Note: the order of the values **<ind>s** is the same as that in which the associated indicators appear from test command **AT+CIND=?**
AT+CIND=?	Test command returns pairs, where string value **<descr>** is a description (max. 16 chars) of the indicator and compound value is the supported values for the indicator, in the format: **+CIND: ((<descr>, (list of supported <ind>s))[,(<descr>, (list of supported <ind>s))[,…]])** where: **<descr>** - indicator names as follows (along with their **<ind>** ranges) "battchg" - battery charge level **<ind>** - battery charge level indicator range 0..5 99 - not measurable "signal" - signal quality **<ind>** - signal quality indicator range 0..7 99 - not measurable "service" - service availability **<ind>** - service availability indicator range 0 - not registered to any network 1 - registered "sounder" - sounder activity **<ind>** - sounder activity indicator range 0 - there's no any sound activity 1 - there's some sound activity

+CIND - Indicator Control	
	"message" - message received **<ind>** - message received indicator range 0 - there is no unread short message at memory locations 1 - unread short message at memory locations "call" - call in progress **<ind>** - call in progress indicator range 0 - there's no calls in progress 1 - at least a call has been established "roam" - roaming **<ind>** - roaming indicator range 0 - registered to home network or not registered 1 - registered to other network "smsfull" - a short message memory storage in the MT has become full (1), or memory locations are available (0) **<ind>** - short message memory storage indicator range 0 - memory locations are available 1 - a short message memory storage in the MT has become full. "rssi" - received signal (field) strength **<ind>** - received signal strength level indicator range 0 - signal strength ≤ (-112) dBm 1..4 - signal strength in 15 dBm steps 5 - signal strength ≥ (-51) dBm 99 - not measurable
Example	*Next command causes all the indicators to be registered* AT+CIND=1,1,1,1,1,1,1,1,1 *Next command causes all the indicators to be de-registered* AT+CIND=0,0,0,0,0,0,0,0,0 *Next command to query the current value of all indicators* AT+CIND? CIND: 4,0,1,0,0,0,0,0,2 OK
Note	See command **+CMER**
Reference	3GPP TS 27.007

5.4.4.6. Mobile Equipment Event Reporting - +CMER

+CMER - Mobile Equipment Event Reporting	
AT+CMER= **[<mode>** **[,<keyp>** **[,<disp>** **[,<ind>** **[,<bfr>]]]]]**	Set command enables/disables sending of unsolicited result codes from TA to TE in the case of indicator state changes (~~n.b.:~~ sending of URCs in the case of key pressings or display changes are currently not implemented). Parameters: **<mode>** - controls the processing of unsolicited result codes 0 - buffer **+CIEV** Unsolicited Result Codes(default) 1 - discard **+CIEV** Unsolicited Result Codes when TA-TE link is reserved (e.g. on-line data mode); otherwise forward them directly to the TE.

+CMER - Mobile Equipment Event Reporting	
	2 - buffer **+CIEV** Unsolicited Result Codes in the TA when TA-TE link is reserved (e.g. on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE. 3 - forward **+CIEV** Unsolicited Result Codes directly to the TE; when TA is in on-line data mode each **+CIEV** URC is stored in a buffer; once the ME goes into command mode (after +++ was entered), all URCs stored in the buffer will be output. **<keyp>** - keypad event reporting 0 - no keypad event reporting **<disp>** - display event reporting 0 - no display event reporting **<ind>** - indicator event reporting 0 - no indicator event reporting(default) 2 - indicator event reporting **<bfr>** - TA buffer clearing 0 - TA buffer of unsolicited result codes is cleared when <mode> 1..3 is entered(default) 1 - TA buffer of unsolicited result codes is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes) Note: After AT+CMER has been switched on with e.g. AT+CMER=2,0,0,2 command (i.e. <bfr> is 0), URCs for all registered indicators will be issued only first time, if previous <mode> was 0, for backward compatibility. Values shown by the indicators will be current indicators values, not buffered ones. Subsequent AT+CMER commands with <mode> different from 0 and <bfr> equal to 0 will not flush the codes, even if <mode> was set again to 0 before. To flush the codes, <bfr> must be set to 1. Although it is possible to issue the command when SIM PIN is pending, it will answer ERROR if "message" or "smsfull" indicators are enabled in AT+CIND, because with pending PIN it is not possible to give a correct indication about SMS status. To issue the command when SIM PIN is pending you have to disable "message" and "smsfull" indicators in AT+CIND first.
AT+CMER?	Read command returns the current setting of parameters, in the format: **+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>**
AT+CMER=?	Test command returns the range of supported values for parameters **<mode>, <keyp>, <disp>, <ind>, <bfr>**, in the format: **+CMER: (list of supported <mode>s),(list of supported <keyp>s), (list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s)**
Reference	3GPP TS 27.007

5.4.4.7. 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>** "SM" - SIM phonebook "FD" - SIM fixed dialling-phonebook (only phase 2/2+ SIM) "LD" - SIM last-dialling-phonebook (**+CPBF** is not applicable for this storage) "MC" - device missed (unanswered received) calls list (**+CPBF** is not applicable for this storage) "RC" - ME received calls list (**+CPBF** is not applicable for this storage). "MB" - mailbox numbers stored on SIM; it is possible to select this storage only if the **mailbox** service is provided by the SIM (see **#MBN**). "DC" - ME last-dialing-phonebook **(+CPBF** is not applicable for this storage). "ME" - MT phonebook "EN" - SIM/USIM (or MT) emergency number (**+CPBW** is not be applicable for this storage) "ON" - SIM own numbers (MSISDNs) phonebook "SD" - SIM Service Dialling Numbers (SDN) phonebook (**+CPBW** is not applicable for this storage). <password>: string type value representing the PIN2-code required when selecting PIN2-code locked <storage> above "FD" Note: If **"SM"** is the currently selected phonebook, selecting**"FD"** phonebook with "**AT+CPBS="FD"**"" command simply selects the FDN as the phonebook upon which all subsequent **+CPBW, +CPBF** and **+CPBR** commands act; the command does not deactivate "SM" phonebook, and does not activate FDN Note: if **<password>** parameter is given, PIN2 will be verified, even if it is not required, i.e. it has already been inserted and verified during current session
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>** Note: For **<storage>="MC"**: if there are more than one missed calls from the same number the read command will return only the last call.
AT+CPBS=?	Test command returns the supported range of values for the parameters **<storage>**.
Reference	3GPP TS 27.007
Example	AT+CPBS="SM" *current phonebook storage is SIM* AT+CPBR=1 +CPBR: 1,"0105872928",129,"James" OK

5.4.4.8. Read Phonebook Entries - +CPBR

+CPBR - Read Phonebook Entries	
AT+CPBR= **<index1>** **[,<index2>]**	Execution command returns phonebook entries in location number range **<index1>**..**<index2>** from the current phonebook memory storage selected with **+CPBS**. If **<index2>** is omitted, only location **<index1>** is returned. Parameters: **<index1>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). **<index2>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). The response format is: **[+CPBR:** **<index1>**,**<number>**,**<type>**,**<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]**[<CR><LF>** **+CPBR:** **<index2>**,**<number>**,**<type>**,**<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]**[…]]]** where: **<index*n*>** - the location number of the phonebook entry **<number>** - string type phone number of format **<type>** **<type>** - type of phone number octet in integer format 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.** <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; 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 Note: if "MC" is the currently selected phonebook memory storage, a sequence of

+CPBR - Read Phonebook Entries	
	missed calls coming from the same number will be saved as one missed call and **+CPBR** will show just one line of information. Note: If all queried locations are empty (but available), no information text lines will be returned, while if listing fails in an **ME** error, **+CME ERROR: <err>** is returned.
AT+CPBR=?	Test command returns the supported range of values for parameters **<index*n*>** and the maximum lengths of **<number>**, **<text>**, <group>, <secondtext> and <email> fields fields, in the format: **+CPBR: (<minIndex>** - **<maxIndex>**),**<nlength>**,**<tlength>**,<glength>,<slength>,<elength> where: **<minIndex>** - the minimum **<index>** number, integer type **<maxIndex>**- the maximum **<index>** number, integer type **<nlength>** - maximum **<number>** field length, integer type **<tlength>** - maximum **<name>** field length, integer type <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: the value of **<nlength>** could vary, depending on the availability of Extension service, in the following situations: 1. if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service 2. if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service 3. if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS="ME" OK AT+CPBS? +CPBS: "ME",1,100 OK AT+CPBR=? +CPBR: (1-100),40,255 OK AT+CPBR=1 +CPBR: 1,"01048771234",129,"James" OK

+CPBR - Read Phonebook Entries	
Reference	3GPP TS 27.007

5.4.4.9. 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.** The command returns a report in the form: **[+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: **<index*n*>** - the location number of the phonebook entry **<number>** - string type phone number of format **<type>** **<type>** - type of phone number octet in integer format 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.** <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; 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

+CPBF - Find Phonebook Entries	
	1: phonebook entry hidden Note: **+CPBF** is not applicable if the current selected storage (see **+CPBS**) is either "MC", either "RC" or "LD". Note: if **<findtext>=""** the command returns all the phonebook records. Note: if no PB records satisfy the search criteria then an **ERROR** message is reported.
AT+CPBF=?	Test command reports the maximum lengths of **<number>** and **<text>** fields, in the format: **+CPBF: <nlength>,<tlength>**,<glength>,<slength>,<elength> where: **<nlength>** - maximum length of field **<number>**, integer type **<tlength>** - maximum length of field **<text>**, integer type <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: the value of **<nlength>** could vary, depending on the availability of Extension service, in the following situations: if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service Note : Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS="ME" Selecting phonebook OK AT+CPBF="J" Searching for string "J" +CPBF: 1,"01048771234",129,"James" +CPBF: 2,"0169998888",129,"Jane" OK Searching for everything in phone book, and finding all entries AT+CPBF="" +CPBF: 1,"01048771234",129,"James" +CPBF: 2,"0169998888",129,"Jane" +CPBF: 7,"0115556666",129,"Juliet" +CPBF: 5,"0181111234",129,"Kevin"

+CPBF - Find Phonebook Entries	
	OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Reference	3GPP TS 27.007

5.4.4.10. Write Phonebook Entry - +CPBW

+CPBW - Write Phonebook Entry	
AT+CPBW= **[<index>]** **[,<number> [,<type>** **[,<text>** [,<group> [,<adnumber> [,<adtype> [,<secondtext> [,<email> [,<hidden>]]]]]]**]]]**	Execution command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with **+CPBS**. Parameters: **<index>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). **<number>** - string type, phone number in the format **<type>** **<type>** - the type of number 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<text>** - the text associated to the number, string type; used character set should be the one selected with command **+CSCS**. <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; 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 Note: If record number **<index>** already exists, it will be overwritten. Note: if either **<number>**, **<type>** and **<text>** are omitted, the phonebook entry in location **<index>** is deleted. Note: if **<index>** is omitted or **<index>**=0, the number **<number>** is stored in the first free phonebook location. (example at+cpbw=0,"+390404192701",129,"Text" and

+CPBW - Write Phonebook Entry	
	at+cpbw=,"+390404192701",129,"Text") Note: if either "LD", "MC" or "RC" memory storage has been selected (see **+CPBS**) it is possible just to delete the phonebook entry in location **<index>**, therefore parameters **<number>**, **<type>** and **<text>** must be omitted. Note: before defining <group> string, it is recommended to check, with **#CPBGR** command, the predefined group names, that could be already stored in USIM in Grouping information Alpha String (GAS) file. If all records in such file are already occupied, **+CPBW** command will return **ERROR** when trying to use a new group name that is not in the predefined GAS names. To define a new custom group string, it is necessary to overwrite with it one of the old predefined strings, using **#CPBGW** command.
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>,<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: the value of **<nlength>** could vary, depending onthe availability of Extension service, in the following situations: 1. if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service 2. if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service 3. if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service
Reference	3GPP TS 27.007
Example	AT+CPBW=? +CPBW: (1-100),40,(129, 145),255 OK AT+CPBW=6,"18651896699",129,"John" OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.

5.4.4.11. Clock Management - +CCLK

AT+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); The range for dd (day) depends both on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31) Trying to enter an out of range value will raise an error **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>.** 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="15/04/07,22:30:00+00" OK AT+CCLK? +CCLK: "02/09/07,22:30:25" OK
Reference	3GPP TS 27.007

5.4.4.12. Alarm Management - +CALA

AT+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 behavior of

AT+CALA – Alarm Management	
	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 "" - (empty string) deletes the current alarm and resets all the **+CALA** parameters to the "factory default" configuration "hh:mm:ss±zz" - format to be used only when issuing **+CALA** with parameter <**recurr**> too. "yy/MM/dd,hh:mm:ss±zz" - generic format: it's the same as defined for **+CCLK** (see) <**n**> - index of the alarm 0 - The only value supported is 0. <**type**> - alarm behavior 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. 3 - 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 starts playing the alarm tone on the selected path for the ringer (see command **#SRP**) The device keeps on playing the alarm tone until a **#WAKE** or #SHDN command is received or a 90 s time-out occurs. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down. 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 GPIO7 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.

AT+CALA – Alarm Management	
	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 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 Note: Default alarmpin is GPIO 7, the alarmpin can be configured with **#ALARMPIN** command. Note: in case of power off alarm, time should be over maximum shutdown time(25 seconds)
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	ETSI 07.07, ETSI 27.007

5.4.4.13. Delete Alarm - +CALD

AT+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

5.4.4.14. Postpone alarm - +CAPD

AT+CAPD – postpone or dismiss an alarm	
AT+CAPD=[<sec>]	Set command postpones or dismisses a currently active alarm. Parameter: **<sec>**: integer type value indicating the number of seconds to postpone the alarm (maximum 60 seconds). If <sec> is set to 0 (default), the alarm is dismissed.
AT+CAPD=?	Test command reports the supported range of values for parameter **<sec>**

5.4.4.15. Setting date format - +CSDF

AT+CSDF – setting date format	
AT+CSDF=[<mode>[,<auxmode>]]	This command sets the date format of the date information presented to the user, which is specified by use of the **<mode>** parameter. The **<mode>** affects the date format on the phone display and doesn't affect the date format of the AT command serial interface, so it not used. The command also sets the date format of the TE-TA interface, which is specified by use of the **<auxmode>** parameter (i.e., the **<auxmode>** affects the **<time>** of AT+CCLK and AT+CALA). If the parameters are omitted then this sets the default value of **<mode>.** Parameters: **<mode>:** 1 DD-MMM-YYYY (default) 2 DD-MM-YY 3 MM/DD/YY 4 DD/MM/YY 5 DD.MM.YY 6 YYMMDD 7 YY-MM-DD **<auxmode>:** 1 yy/MM/dd (default) 2 yyyy/MM/dd Note: The <**time**> format of +CCLK and +CALA is "yy/MM/dd,hh:mm:ss+zz" when <**auxmode**>=1 and it is "yyyy/MM/dd,hh:mm:ss+zz" when <**auxmode**>=2.

AT+CSDF – setting date format	
AT+CSDF?	Read command reports the currently selected **<mode>** and **<auxmode>** in the format : **+CSDF:<mode>,<auxmode>**
AT+CSDF=?	Test command reports the supported range of values for parameters **<mode>** and **<auxmode>**

5.4.4.16. Setting time format - +CSTF

AT+CSTF – setting time format	
AT+CSTF=[<mode>]	This command sets the time format of the time information presented to the user, which is specified by use of the **<mode>** parameter. The **<mode>** affects the time format on the phone display and doesn't affect the time format of the AT command serial interface, so it not actually not used. Parameters: **<mode>:** 1 HH:MM (24 hour clock; default) 2 HH:MM a.m./p.m.
AT+CSTF?	Read command reports the currently selected **<mode>** in the format : **+CSTF:<mode>**
AT+CSTF=?	Test command reports the supported range of values for parameters **<mode>**

5.4.4.17. Time Zone reporting - +CTZR

+CTZR – Time Zone reporting	
AT+CTZR=<reporting>	This command enables and disables the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV:<tz> , or +CTZE: <tz>,<dst>,[<time>] whenever the time zone is changed. Parameters: **<reporting>:** 0 Disable time zone change event reporting (default) 1 Enable time zone change event reporting by unsolicited result code +CTZV: <tz> 2 Enable extended time zone reporting by unsolicited result code +CTZE: <tz>,<dst>,[<time>] **<tz>:** sum of the local time zone **<dst>:** 0 <tz> includes no adjustment for Daylight Saving Time 1 <tz> includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight saving time 2 <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time <time>**:** string type value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss". This parameter can be provided by the network.

+CTZR – Time Zone reporting	
AT+CTZR?	Read command reports the currently selected <**reporting**> in the format: **+CTZR: <reporting>**
AT+CTZR=?	Test command reports the supported range of values for parameter <**reporting**>

5.4.4.18. Automatic Time Zone update - +CTZU

+CTZU – Automatic Time Zone update	
AT+CTZU=<onoff>	This command enable and disables automatic time zone update via NITZ. Parameters: **<onoff>:** 0 Disable automatic time zone update via NITZ (default) 1 Enable automatic time zone update via NITZ Note: despite of the name, the command AT+CTZU=1 enables automatic update of the date and time set by AT+CCLK command (not only time zone). This happens when a Network Identity and Time Zone (NITZ) message is sent by the network. This command is the ETSI standard equivalent of Telit custom command AT#NITZ=1. If command AT+CTZU=1, or AT#NITZ=1 (or both) has been issued, NITZ message will cause a date and time update.
AT+CTZU?	Read command reports the currently selected <**onoff**> in the format: **+CTZU: <onoff>**
AT+CTZU=?	Test command reports the supported range of values for parameter <**onoff**>

5.4.4.19. Restricted SIM Access - +CRSM

+CRSM - Restricted SIM Access	
AT+CRSM= **<command>** **[,<fileid>** **[,<P1>,<P2>,<P3>** **[,<data>[,<pathid>]]]]**	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 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. <**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

+CRSM - Restricted SIM Access	
	<data> - information to be read/written to the SIM (hexadecimal character format). **<pathid>** - string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format. The <pathid> shall only be used in the mode "select by path from MF" (e.g. "7F205F70"). 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: 144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFF0681105678 9282FFFFFFFFFFFFF OK Update Binary, KcGPRS(6F52) AT+CRSM=214,28498,0,0,7,C69018C7958C87 +CRSM: 144,0 OK Update Record, ADN(6F3A) AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFF

+CRSM - Restricted SIM Access	
	+CRSM: 144,0 OK Status, FPLMN(6F7B) AT+CRSM=242,28539 +CRSM: 144,0,623C820238218410A0000000871002FFFFFFFF8904 0300FFA5118001318103010A3282011E8304000030E08A01058B032F0609C609 9001C0830101830181 OK Get Response, MSISDN(6F40) AT+CRSM=192,28480,4,0,4,,7F106F40 +CRSM: 144,0,621E8205422100260283026F40A5039201008A01058B036F06058 002004C8800 OK
Reference	3GPP TS 27.007, 3GPP TS 11.11/51.011

5.4.4.20. Generic SIM Acess - +CSIM

+CSIM – Generic SIM Access	
AT+CSIM=<lock>	Between two successive +CSIM command the SIM-ME interface must be locked to avoid commands can modify wrong SIM file. The locking and unlocking of the SIM-ME interface must be done explicitly respectively at the beginning and at the end of the +CSIM commands sequence. Parameters: <**lock**> 1 - locking of the interface 0 - unlocking of the interface In case that TE application does not use the unlock command in a certain timeout value, ME releases the locking.
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 code (e.g. "A0A4.....") Response syntax:

+CSIM – Generic SIM Access	
	+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 Error case: *+CME ERROR: <err>* possible <err> values (numeric format followed by verbose format): 3 operation not allowed *(operation mode is not allowed by the ME)* 4 operation not supported *(wrong format or parameters of the command)* 13 SIM failure *(SIM no response)*
AT+CSIM=?	Test command returns the OK result code.
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011
Example	**2G SIM (TS 11.11):** *STATUS* AT+CSIM=10,A0F2000016 +CSIM:48,”000002A87F20020000000000000993002208000838A838A9000” OK *SELECT EF 6F07* AT+CSIM=14,A0A40000026F07 +CSIM: 4,”9F0F” OK *GET RESPONSE* AT+CSIM=10,A0C000000F +CSIM: 34,”000000096F0704001A001A010200009000” OK *SELECT EF 6F30* AT+CSIM=14,A0A40000026F30 +CSIM: 4,”9F0F” OK *READ BINARY* AT+CSIM=10,A0B00000FC +CSIM:508,”FFFFFF13008313009013005413003013006513003813008013018 01 3000113110913013013009813007713005913004313008113009513014013002313 0016330420130041FFFFFFFFFFFF21436542F41922F28822F201FFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

+CSIM – Generic SIM Access	
	FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFF9000” OK **3G UICC (3G TS 31.101):** *STATUS* AT+CSIM=10,A0F2000016 +CME ERROR: operation not supported *STATUS* AT+CSIM=10,80F2000016 +CSIM:134,"623F8202782183027FF08410A0000000871002FFFFFFFF89060400 FFA507800171830284828A01058B032F0602C6129001788301018301 0A83010B 83010E8301819000" OK *SELECT EF 6F07 No Data Returned* AT+CSIM=18,00A4080C047F206F07 +CSIM: 4,"9000" OK *SELECT EF 6F30 Return FCP Template* AT+CSIM=18,00A40804047F206F30 +CSIM:68,"621E8202412183026F30A506C00140DE01008A01058B036F060480 02006988009000" OK *READ BINARY* AT+CSIM=10,00B0000069 +CSIM:214,"02F81012F47022F83082F63082F64022F60192F31412F6031300613 2F40102F20162F21032F23002F60182F41012F91042F41902F46102F40242F2209 2F52072F22062F03062F86032F01032F11042F01032F80217F60127F42027F4302 7F44027F24337F62037F0209000" OK
Note	For the following instructions (value of the second byte): A4 : SELECT 10 : TERMINAL PROFILE C2 : ENVELOPE 14 : TERMINAL RESPONSE

+CSIM – Generic SIM Access	
	A2 : SEEK the value of the fifth byte of <**command**> must be equal to the number of bytes which follow (data starting from 6th byte) and this must be equal to <**length**>/2 – 5 otherwise the command is not send to the SIM and CME_ERROR=4 is returned.

5.4.4.21. 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
AT+CALM=?	Test command returns the supported values for the parameter **<mode>** as compound value **+CALM : (0 – 2)**
Reference	3GPP TS 27.007

5.4.4.22. 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 (factory default) 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

5.4.4.23. Loudspeaker Volume Level - +CLVL

+CLVL - LoudSpekaer Volume Level

+CLVL - LoudSpekaer Volume Level	
AT+CLVL= <level>	It has no effect and is included only for backward compatibility. 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=?** 10 - factory default
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

5.4.4.24. 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 valid only in voice call. 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

5.4.4.25. Silence command - +CSIL

+CSIL- Silence Command	
AT+CSIL=[<mode>]	This command enables/disables the silent mode. When the phone is in silent mode, all signalling tones from MT are suppressed.

+CSIL- Silence Command	
	Parameter: **<mode>:** 0 Silent mode off (default) 1 Silent mode on
AT+CSIL?	Read command reports the currently selected **<mode>** in the format: **+CSIL: <mode>**
AT+CSIL=?	Test command reports the supported range of values for parameter **<mode>**

5.4.4.26. 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

5.4.4.27. 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>** - ACMmax value, integer type: it is the maximum number of home units allowed to be consumed by the subscriber. **<pwd>** - PIN2; if PIN2 has been already input once after startup, it is required no more Note: **<acmmax>** = 0 value disables the feature.

+CAMM - Accumulated Call Meter Maximum	
AT+CAMM?	Read command reports the ACMmax value stored in SIM in the format: **+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

5.4.4.28. 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: **+CPUC : <currency>,<ppu>**
AT+CPUC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.29. Call Meter maximum event - +CCWE

+CCWE – Call Meter maximum event	
AT+CCWE=<mode>	Set command is used to enable/disable sending of an unsolicited result code +CCWV shortly before the ACM (Accumulated Call Meter) maximum value is reached. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 seconds call time remains. Parameter: **<mode>** 0 - disable the call meter warning event (factory default) 1 - enable call meter warning event Note: the set command will respond with an error if the Accumulated Call Meter

+CCWE – Call Meter maximum event	
	service is not active in SIM
AT+CCWE?	Read command reports the currently selected <mode> in the format: **+CCWE : <mode>**
AT+CCWE=?	Test command reports the supported range of value for **<mode>** parameter.
Reference	3GPP TS 27.007

5.4.4.30. Set voice mail number - +CSVM

+CSVM – Set Voice Mail Number	
AT+CSVM=<mode>[,<number>[,<type>]]	The number to the voice mail server is set with this command. The parameters **<number>** and **<type>** can be left out if the parameter **<mode>** is set to 0. Parameters: **<mode>** 0 – disable the voice mail number 1 – enable the voice mail number (factory default) **<number>** - string type phone number of format specified by **<type>** **<type>** - type of address octet in integer format 129 - unknown type of number and ISDN/Telephony numbering plan 145 - international type of number and ISDN/Telephony numbering plan (contains the character "+")
AT+CSVM?	Read command returns the currently selected voice mail number and the status (i.e. enabled/disabled) in the format **+CSVM:<mode>,<number>,<type>**
AT+CSVM=?	Test command reports the range for the parameters **<mode>** and **<type>**.
Reference	3GPP TS 27.007

5.4.4.31. 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

5.4.4.32. Open Logical Channel - +CCHO

+CCHO – Open Logical Channel	
AT+CCHO=<dfname>	Execution of the command causes the MT to return **<sessionid>** to allow the TE to identify a channel that is being allocated by currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical channel; select the application identified by the **<dfname>** received with this command and return a session Id as the response. The ME shall restrict the communication

+CCHO – Open Logical Channel	
	between the TE and the UICC to this logical channel. This **<sessionid>** is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or Generic UICC Logical Channel access +CGLA commands. Parameter **<dfname>**: all selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes. The response of the command is in the format: **+CCHO: <sessionid>** where: **<sessionid >** : integer type; a session ID to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism. It is to be used when sending commands with +CGLA commands. See 3GPP TS 31.101 for more information about defined values. Error case: +CME ERROR: possible <err> values (numeric format followed by verbose format): 3 operation not allowed (operation mode is not allowed by the ME) 4 operation not supported (wrong format or parameters of the command) 13 SIM failure (SIM response SW1 SW2 status byte Error) 15 SIM wrong (SIM response SW1 SW2 status byte Error) 21 invalid index (not correspond to an opened channel) 100 unknown (generic error) Note: The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 for further information on logical channels in APDU commands protocol.
AT+CCHO=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.33. Close Logical Channel - +CCHC

+CCHC – Close Logical Channel	
AT+CCHC= <sessionid>	This command asks the ME to close a communication session with the UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command.

+CCHC – Close Logical Channel	
	Parameter < **sessionid** >: A session ID to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism. Error case: +CME ERROR: possible <err> values (numeric format followed by verbose format): 3 operation not allowed (operation mode is not allowed by the ME) 4 operation not supported (wrong format or parameters of the command) 13 SIM failure (SIM response SW1 SW2 status byte Error) 15 SIM wrong (SIM response SW1 SW2 status byte Error) 21 invalid index (not correspond to an opened channel) 100 unknown (generic error)
AT+CCHC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.34. Generic UICC Logical Channel Access - +CGLA

+CGLA – Generic UICC Logical Channel Access	
AT+CGLA=<sessionid>,<length>,<command>	Set command transmits to the MT the it then shall send as it is to the selected UICC. In the same manner the UICC shall be sent back by the MT to the TA as it is. This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS. Parameter: : **<sessionid>** : integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0") **<length>**: integer type; length of the characters that are sent to TE in or (two times the actual length of the command or response) : command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format; refer +CSCS) The response of the command is in the format: **+CGLA: <length>,<response>** where: **<response>**: response to the command passed on by the SIM to the ME in the format as described in GSM TS 11.11 or 3G TS 31.101 (hexadecimal character format). See 3GPP TS 31.101 for more information about defined values. Error case:

+CGLA – Generic UICC Logical Channel Access	
	+CME ERROR: possible <err> values (numeric format followed by verbose format): 3 operation not allowed (operation mode is not allowed by the ME) 4 operation not supported (wrong format or parameters of the command) 13 SIM failure (SIM response SW1 SW2 status byte Error) 15 SIM wrong (SIM response SW1 SW2 status byte Error) 21 invalid index (not correspond to an opened channel) 100 unknown (generic error) Note: When the SW1 SW2 bytes received from UICC in response to **<command>** are "61 XX", MT automatically send to UICC a GET RESPONSE command with length "XX" and the +CGLA **<response>** is that retuned by GET RESPONSE command.
AT+CGLA=?	Test command returns the OK result code.
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011

5.4.4.35. UICC Application Discovery - +CUAD

+CUAD – UICC Application Discovery	
AT+CUAD	This command asks the MT to discover what applications are available for selection on the UICC. The ME shall access and read the EFDIR file in the UICC and return the values that are stored in ist records. Response syntax: **+CUAD**: <**response**> Where: <**response**> string type in hexadecimal character format. The response is the content of the EFDIR.
AT+CUAD=?	Test command returns the OK result code.
Reference	3GPP TS 27.007, ETSI TS 102.221

5.4.4.36. Remaining PIN retries - +CPINR

+CPINR – Remaining PIN retries	
AT+CPINR [=<sel_code>]	Execution command cause the ME to return the number of remaining PIN retries for the ME passwords. Parameter: **<sel_code>** - String type. These values are strings and shall be indicated within double quotes. It is optional to support wildcard match by '*', meaning match any (sub-)string.(parameter is listed under the description of command +CPIN, <code> parameter, except 'READY', 'PH-SIM PIN') The response format is: +CPINR: <code>,<retries>[,<default_retries>][<CR><LF> +CPINR: <code>,<retries>[,<default_retries>][…]]

+CPINR – Remaining PIN retries	
	where: **<code>** - string type. Type of PIN. **<retries>** - integer type. Number of remaining retries per PIN. **<default_retries>** - integer type. Number of default/initial retries per PIN. Note : PH-PUK states is not allowed unblock procedure, forward.
AT+CPINR=?	Test command returns the OK result code.
EXAMPLE	AT+CPINR="SIM*" +CPINR: SIM PIN,3,3 +CPINR: SIM PUK,10,10 +CPINR: SIM PIN2,3,3 +CPINR: SIM PUK2,10,10 OK AT+CPINR="*SIM*" // will additionally return the lines: +CPINR: PH-FSIM PIN,10,10 +CPINR: PH-FSIM PUK,0,0 OK
Reference	3GPP TS 27.007

5.4.4.37. Extended Signal Quality - +CESQ

+CESQ – Extended Signal Quality	
AT+CESQ	Execution command reports received signal quality parameters in the form: **+CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>** Where **< rxlev >** - received received signal strength level (see 3GPP TS 45.008 subclause 8.1.4). 0 - rssi < -110 dBm 1 - -110 dBm ≤ rssi < -109 dBm 2 - -109 dBm ≤ rssi < -108 dBm ... 61 - -50 dBm ≤ rssi < -49 dBm 62 - -49 dBm ≤ rssi < -48 dBm 63 - -48 dBm ≤ rssi 99 - not known or not detectable or if the current serving cell is not a GERAN cell **<ber>** - bit error rate (in percent) 0...7 - as RXQUAL values in the table in 3GPP TS 45.008 subclause 8.2.4 99 - not known or not detectable or if the current serving cell is not a GERAN cell **<rscp>** - received signal code power (see 3GPP TS 25.133 subclause 9.1.1.3 and 3GPP TS 25.123 subclause 9.1.1.1.3).

+CESQ – Extended Signal Quality	
	0 - rscp < -120 dBm 1 - -120 dBm ≤ rscp < -119 dBm 2 - -119 dBm ≤ rscp < -118 dBm ... 94 - -27 dBm ≤ rscp < -26 dBm 95 - -26 dBm ≤ rscp < -25 dBm 96 - -25 dBm ≤ rscp 255 - not known or not detectable or if the current serving cell is not a UTRA cell <**ecno**> - ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 subclause). 0 - Ec/Io < -24 dB 1 - -24 dB ≤ Ec/Io < -23.5 dB 2 - -23.5 dB ≤ Ec/Io < -23 dB ... 47 - -1 dB ≤ Ec/Io < -0.5 dB 48 - -0.5 dB ≤ Ec/Io < 0 dB 49 - 0 dB ≤ Ec/Io 255 - not known or not detectable detectable or if the current serving cell is not a UTRA cell **<rsrq>** - reference signal received quality (see 3GPP TS 36.133 subclause 9.1.7). 0 - rsrq < -19.5 dB 1 - -19.5 dB ≤ rsrq < -19 dB 2 - -19 dB ≤ rsrq < -18.5 dB ... 32 - -4 dB ≤ rsrq < -3.5 dB 33 - -3.5 dB ≤ rsrq < -3 dB 34 - -3 dB ≤ rsrq 255 - not known or not detectable detectable or if the current serving cell is not a EUTRA cell **<rsrp>** - type, reference signal received power (see 3GPP TS 36.133 subclause 9.1.4). 0 - rsrp < -140 dBm 1 - -140 dBm ≤ rsrp < -139 dBm 2 - -139 dBm ≤ rsrp < -138 dBm ... 95 - -46 dBm ≤ rsrp < -45 dBm 96 - -45 dBm ≤ rsrp < -44 dBm 97 - -44 dBm ≤ rsrp 255 - not known or not detectable detectable or if the current serving cell is not a EUTRA cell
AT+CESQ=?	Test command returns the supported range of values of the parameters **<rxlev>, <ber>, <rscp>, <ecno>, <rsrq>, <rsrp>.**

+CESQ – Extended Signal Quality	
Reference	3GPP TS 27.007

5.4.4.38. Primary Notification Event Reporting - +CPNER

+CPNER – Primary Notification Event Reporting	
AT+CPNER=[<reporting>]	Set command enables and disables reporting of primary notification events when received from the network with unsolicited result code **+CPNERU: (see format below)**. Primary notification events used for public warning systems like ETWS (Earthquake and Tsunami Warning Systems). Parameter: **<reporting>** - integer type, controlling reporting of primary notification events. 0 - Disable primary notification events. 1 - Enable reporting of primary notification events without security information, unsolicited result code(default) **+CPNERU: <message_identifier>,<serial_number>,<warning_type>** **<message_identifier>** string type in hexadecimal character format. The parameter contains the message identifier (2 bytes) of the primary notification. **<serial_number>** string type in hexadecimal character format. The parameter contains the serial number (2 bytes) of the primary notification. **<warning_type>** string type in hexadecimal character format. The parameter contains the warning type (2 bytes) of the primary notification.
AT+CPNER?	Read command reports the current value of the parameter <reporting>.
AT+CPNER=?	Test command returns supported of <reporting> parameter.
Example	AT+CPNER? +CPNER: 1 OK
Reference	3GPP TS 27.007

5.4.5. Mobile Equipment Errors

5.4.5.1. 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

+CMEE - Report Mobile Equipment Error	
	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

5.4.6. Voice Control

5.4.6.1. DTMF Tones Transmission - +VTS

+VTS – DTMF Tones Transmission	
AT+VTS=<dtmf>[,<duration>]	Execution command allows the transmission of DTMF tones. Parameters: **<dtmf>** - string of DTMF tones**,** i.e. ASCII characters in the set **(0-9), #,*,(A-D),P**; a length of the string can be at most 255; it allows the user to send a sequence of DTMF tones, each of them with a duration that 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 command operates in voice mode only (see **+FCLASS**). Note: the character P does not correspond to any DTMF tone, but it is interpreted as a pause of 3 seconds between the preceding and succeeding DTMF string elements
AT+VTS=?	Test command provides the list of the supported format in **<dtmf>** and the list of supported **<duration>** in the format: (list of supported format of <dtmf>)[,(list of supported <duration>)]
Reference	3GPP TS 27.007 and TIA IS-101

5.4.6.2. 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

5.4.7. Commands For Packet Domain

5.4.7.1. GPRS Mobile Station Class - +CGCLASS

+CGCLASS – GPRS Mobile Station Class	
AT+CGCLASS=[<class>]	Set command is used to set the MT to operate according to the specified mode of operation. Parameter: **<class>** "A" – Class-A mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode) (factory default) "B" – Class-B mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode) "CG" – Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode) "CC" – Class-C mode of operation in CS only mode (A/Gb mode), or CS (Iu mode) Note: the setting is saved in NVM(and available on following reboot).
AT+CGCLASS?	Read command returns the mode of operation set by the TE. format: **+CGCLASS: <class>**
AT+CGCLASS=?	Test command reports the range for the parameter **<class>**.
Reference	3GPP TS 27.007

5.4.7.2. PS Attach Or Detach - +CGATT

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

+CGATT - PS attach or detach	
	OK
Reference	3GPP TS 27.007

5.4.7.3. Packet domain Event Reporting - +CGEREP

+CGEREP – Packet domain 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 **TA** or the network. **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**> - controls the effect on buffered codes when <mode> 1 or 2 is entered: 0 - TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 or 2 is entered. 1 - TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered (OK response shall be given before flushing the codes). **Unsolicited Result Codes** The following unsolicited result codes and the corresponding events are defined: **+CGEV: REJECT <PDP_type>, <PDP_addr>** A network request for PDP context activation occurred when the **TA** was unable to report it to the **TE** with a +**CRING** unsolicited result code and was automatically rejected. **+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]** The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to **TA.** **+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]** The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to **TA.** **+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]** The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to **TA.**

+CGEREP – Packet domain Event Reporting	
	+CGEV: NW DETACH The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME DETACH** The mobile equipment has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME CLASS <class>** The mobile equipment has forced a change of MS class. The highest available class is reported (see **+CGCLASS**)
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.
Example	AT+CGEREP=? +CGEREP: (0-2),(0,1)
Reference	3GPP TS 27.007

5.4.7.4. 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 network registration status for Packet Service, 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>[,<AcT>,<rac>]]** where: **<stat>** - registration status (see above for values) **<lac>** - location area code(2G, 3G) or tracking area code(4G) in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>** - cell ID in hexadecimal format. **<AcT>**: access technology of the registered network: 0 GSM 2 UTRAN 3 GSM w/EGPRS 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA 7 E-UTRAN **<rac>**: string type; one byte routing area code(2G, 3G) or Mobile Management Entity code(4G) in hexadecimal format Note: **<lac>, <ci>, <AcT>** and **<rac>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CGREG?	Read command returns the status of result code presentation mode **<n>** and the

+CGREG - GPRS Network Registration Status	
	integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format: **+CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]]** **Note**: **<lac>, <ci>, <AcT>** and **<rac>** are reported only if **<mode>=2** and the mobile is registered on some network cell. **Note:** 4G/3G only products like LE922A6-A1 does not support GSM access technology. **Note:** 4G only products like LE922A6-E1 does not support GSM and UTRA access technology. **Note**: **<lac>** and**<rac>** values will change **<tac>** and **<mme_code>** values in LTE.
AT+CGREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

5.4.7.5. Printing IP Address - +CGPIAF

+CGPIAF Printing IP Address Format	
AT+CGPIAF = **[<IPv6_AddressFormat>** **[,<IPv6_SubnetNotation>** **[,<IPv6_leadingZeros>** **[,<IPv6_compressZeros>]]]]**	**Description:** Set command decides what the format to print IPv6 address parameter. Parameters: **<IPv6_AddressFormat>** - decides the IPv6 address format. Relevant for all AT command parameters, that can hold an IPv6 address. 0 – Use IPv4-like dot-notation. IP addresses, and subnetwork mask if applicable, are dot-separated. 1 – Use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space. **<IPv6_SubnetNotation>** - decides the subnet-notation for <remote address and subnet mask> Setting does not apply if IPv6 address format <IPv6_AddressFormat> = 0. 0 – Both IP address, and subnet mask are started explicitly, separated by a space. 1 – The printout format is applying /(forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation. **<IPv6_LeadingZeros>** - decides whether leading zeros are omitted or not. Setting does not apply if IPv6 address format <IPv6_AddressFormat> = 0. 0 – Leading zeros are omitted. 1 – Leading zeros are included. **<IPv6_CompressZeros>** - decides whether 1-n instances of 16-bit- zero-values are replaced by only "::". This applies only once. Setting does not apply if IPv6 address format <IPv6_AddressFormat> = 0. 0 – No zero compression. 1 – Use zero compression.
AT+CGPIAF?	Read command returns the current parameter setting.

AT+CGPIAF=?	Test command returns values supported as compound parameter setting.
Example	AT+CGPIAF=0,0,0,0 OK AT#SGACT=1,1 #SGACT: 252.1.171.171.205.205.239.224.0.0.0.0.0.0.0.1 OK AT+CGPIAF=1,0,0,0 OK AT#SGACT=1,1 #SGACT: FC01:ABAB:CDCD:EFE0:0:0:0:1 OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.7.6. Define PDP Context - +CGDCONT

+CGDCONT - Define PDP Context	
+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]]]]]]	Set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, **<cid>** Parameters: **<cid>** - (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 "PPP" - Point to Point Protocol "IPV6" - Internet Protocol version 6 "IPV4V6" - Virtual <PDP_type> introduced to handle dual IP stack UE capability **NOTE : Only IP, IPV6 and IPV4V6 values are supported for EPS(LTE) services.** **<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 empty (**“”**) 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.When **+CGPIAF** is supported, it’s settings can influence the format of this parameterreturned with the read form of **+CGDCONT**. **NOTE : For EPS(LTE), this field is omitted.** **<d_comp>** - a numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065 [61]) 0 - off (default) 1 - on 2 - V.42bis **<h_comp>** - numeric parameter that controls PDP header compression. 0 - off (default)

+CGDCONT - Define PDP Context	
	1 - on (manufacturer preferred compression) 2 - RFC1144 (applicable for SNDCP only) 3 - RFC2507 4 - RFC3095 (applicable for PDCP only) **<IPv4AddrAlloc> -** integer type; controls how the MT/TA requests to get the IPv4 address information 0 - (default) IPv4 address allocation through NAS signalling 1 - IPv4 address allocated through DHCP <**emergency indication**> - a numeric parameter used to indicate whether the PDP context is for emergencybearer services or not. 0 - (default) PDP context is not for emergency bearer services 1 - PDP context is for emergency bearer services <**P-CSCF_discovery**> - a numeric parameter influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L. 0 - (default) Preference of P-CSCF address discovery not influenced by +CGDCONT 1 - Preference of P-CSCF address discovery through NAS Signalling 2 - Preference of P-CSCF address discovery through DHCP <**IM_CN_Signalling_Flag_Ind**>: a numeric parameter used to indicate to the network whether the PDPcontext is for IM CN subsystem-related signalling only or not. 0 - (default) UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 - UE indicates that the PDP context is for IM CN subsystem-related signalling only Note: a special form of the Set command, **+CGDCONT=<cid>**, causes the values for context number **<cid>** to become undefined. Note : if emergence indication is enabled, this profile can not be used attached profile.
AT+CGDCONT?	Read command returns the current settings for each defined context in the format: **+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]][<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]][...]]**
AT+CGDCONT=?	Test command returns values supported as a compound value.
Example	AT+CGDCONT=1,”IP”,”APN”,”10.10.10.10”,0,0,0,0,0.0 OK

+CGDCONT - Define PDP Context	
	AT+CGDCONT? +CGDCONT: 1,”IP”,“APN”,”10.10.10.10”,0,0,0,0,0,0 OK AT+CGDCONT=? +CGDCONT: (1-16),"IP",,,(0-2),(0-4),(0-1),(0-1),(0-2),(0-1) +CGDCONT: (1-16),"PPP",,,(0-2),(0-4),(0-1),(0-1),(0-2),(0-1) +CGDCONT: (1-16),"IPV6",,,(0-2),(0-4),(0-1),(0-1),(0-2),(0-1) +CGDCONT: (1-16),"IPV4V6",,,(0-2),(0-4),(0-1),(0-1),(0-2),(0-1) OK
Reference	3GPP TS 27.007

5.4.7.7. 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 specify a minimum acceptable profile, 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 0 - 3 (default 0) **<delay>** - delay class 0 - 4 (default 0) **<reliability>** - reliability class 0 - 5 (default 0) **<peak>** - peak throughput class 0 - 9 (default 0) **<mean>** - mean throughput class 0 ~ 18, 31 (default 0) If a value 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. If no PDP context defined, it has no effect and **OK** result code returned.
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 **OK** 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)
Example	AT+CGQMIN? +CGQMIN: 1,0,0,0,0,0 AT+CGQMIN=1,0,0,3,0,0 OK 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) +CGQMIN: "IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

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

+CGQREQ – Quality Of Service Profile (Requested)	
AT+CGQREQ= **[<cid>** **[,<precedence>** **[,<delay>** **[,<reliability>** **[,<peak>** **[,<mean>]]]]]]**	Set command allows specify Quality of Service Profile that 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 0 - 3 (default 0) **<delay>** - delay class 0 - 4 (default 0) **<reliability>** - reliability class 0 - 5 (default 0) **<peak>** - peak throughput class 0 - 9 (default 0) **<mean>** - mean throughput class 0 - 18, 31 (default 0) If a value 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 defined, it has no effect and **OK** result code 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)**
Example	AT+CGQREQ? +CGQREQ: 1,0,0,0,0,0 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) +CGQREQ: "IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.7.9. 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>** **[,<Source statistics**	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 (default value)

descriptor> [,<Signalling indication>]]]]]]]]]]]]]]	**<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1 - 568 576 - 11520 **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1 - 568 576 - 8640 8700 - 42200 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1 - 568 576 - 11520 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1 - 568 576 - 8640 8700 - 42200 **<Delivery order>** - SDU Delivery order 0 - no 1 – yes 2 – subscribed value (default value) **<Maximum SDU size**> - Maximum SDU size in octets 0 - subscribed value (default 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” (default value) “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" (default value) "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8" **<Delivery of erroneous SDUs>** - Delivery of erroneous SDUs 0 - no 1 - yes 2 - no detect 3 - subscribed value (default value) **<Transfer delay >** - Transfer delay (milliseconds) 0 - subscribed value (default value) 10 - 150 200 - 950 1000 - 4000 **<Traffic handling priority >** - Traffic handling priority 0 - subscribed value (default value) 1 - 3 **<Source Statistics Descriptor>** - Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - Characteristics of SDUs is unknown (default value) 1 - Characteristics of SDUs corresponds to a speech source **<Signalling Indication>** - Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the **<Traffic class>** is specified as interactive. 0 - PDP context is not optimized for signalling (default value) 1 - PDP context is optimized for signalling **<PDP_type>** (see **+CGDCONT** command).

	Note: a special form of the Set command, **+CGEQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined. Note: the current settings are stored in NVM. Note: set command can modify the 2G QoS according to 3GPP 23.107 (see **+CGQREQ**).
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>,<Source statistics descriptor>,<Signalling indication><CR><LF>]** **[+CGEQREQ:…]** 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: **+CGQEQREQ: <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), (list of supported <Source statistics descriptor>s), (list of supported <Signalling indication>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",0,0,0,0,0 OK AT+CGEQREQ=? **+CGEQREQ:** "IP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200), (0-568,576-11520), (0-568,576-8640,8700-42200),(0-2),(0.10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0

	-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQREQ**: "PPP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQREQ:** "IPV6",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200), (0-568,576-11520), (0-568,576-8640,8700-42200),(0-2),(0.10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQREQ:** "IPV4V6",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200), (0-568,576-11520), (0-568,576-8640,8700-42200),(0-2),(0.10- 1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.7.10. 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>**	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 (default value) **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s) 0 - subscribed value (default value) 1 - 568, 576 - 11520 **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s)

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signalling indication>]]]]]]]]]	0 - subscribed value (default value) 1 - 568 576 - 8640, 8700 - 42200 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s) 0 - subscribed value (default value) 1 - 568 576 - 11520 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s) 0 - subscribed value (default value) 1 - 568 576 - 8640 8700 - 42200 **<Delivery order>** SDU Delivery oreder 0 - no 1 - yes 2 - subscribed value (default value) **<Maximum SDU size>** Maximum SDU size in octets 0 - subscribed value (default 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” (default value) “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” (default value) “5E2” “1E2” “5E3” “4E3”

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	"1E3" "1E4" "1E5" "1E6" "6E8" **<Delivery of erroneous SDUs>** Delivery of erroneous SDUs 0 - no 1 - yes 2 - no detect 3 - subscribed value (default value) **<Transfer delay >** Transfer delay (milliseconds) 0 - subscribed value (default value) 10 - 150 200 - 950 1000 - 4000 **<Traffic handling priority >** Traffic handling priority 0 - subscribed value (default value) 1 - 3 **<Source Statistics Descriptor>** Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the <Traffic class> is specified as conversational or streaming. 0 - Characteristics of SDUs is unknown (default value) 1 - Characteristics of SDUs corresponds to a speech source **<Signalling Indication>** Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the <Traffic class> is specified as interactive. 0 - PDP context is not optimized for signalling (default value) 1 - PDP context is optimized for signalling <PDP_type> (see +CGDCONT command). Note: a special form of the Set command, **+CGEQMIN=<cid>** causes the requested profile for context number **<cid>** to become undefined.
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>< Source Statistics Descriptor >< Signalling Indication ><CR><LF>]** **[+CGEQMIN:…]** If no PDP context has been defined, it has no effect and **OK** result code is returned.

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
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: **+CGEQMIN: <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),(list of supported <Source statistics descriptor>s) ,(list of supported < Signalling indication>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 **AT+CGEQMIN=?** **+CGEQMIN:** "IP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQMIN**: "PPP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQMIN**: "IPV6(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQMIN**: "IPV4V6(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1)
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.7.11. 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.

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
	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).
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 AT+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

5.4.7.12. Set Mode of Operator for EPS - +CEMODE

+CEMODE – Set mode of operation for EPS.	
AT+CEMODE=[<mode>]	Set command configures the mode of operation for EPS **Parameter:** **<mode>:** a numeric parameter which indicates the mode of operation 0 - PS mode 2 of operation 1 - CS/PS mode 1 of operation 2 - CS/PS mode 2 of operation 3 - PS mode 1 of operation Note**:** The definition for UE modes of operation can be found in 3GPP TS 24.301 [83] Other values are reserved and will result in an ERROR response to the set command.

+CEMODE – Set mode of operation for EPS.	
AT+CEMODE?	Read command returns the currently configured values, in the format: **+CEMODE**: **< mode >** **Note:** The read command will return right values after set command. But effectively the mode of operation changes after power cycle.
AT+CEMODE =?	Test command returns the supported range of values of parameters < mode> **+CEMODE**: (0-3)
Example	AT+CEMODE=1 OK AT+CEMODE? +CEMODE: 1 OK

5.4.7.13. 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). It is only for the testing purpose. Please use #SGACT command to take advantage of data service on this module. 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. If any defined profile is failed during activating/deactiving, stop activating/deactivating and reponse ERROR. Note: Execute command responses Error as executing +CGACT=0 without +CGACT=1 or +CGACT=1,1. Note: at least three <cid>s can be activated at the same time.
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)**

+CGACT - PDP Context Activate Or Deactivate	
Example	AT+CGACT=1,1 OK AT+CGACT? +CGACT: 1,1 OK
Reference	3GPP TS 27.007

5.4.7.14. 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: <cid>,<PDP_addr>[<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+CGPADDR = +CGPADDR: 1,"10.76.2.254"

+CGPADDR - Show PDP Address	
	+CGPADDR: 2,"" +CGPADDR: 3,"" OK
Reference	3GPP TS 27.007

5.4.7.15. Modify PDP Context - +CGCMOD

+CGCMOD – Modify PDP context	
AT+CGCMOD=[<cid>[,<cid>[,…]]]	The execution command is used to modify the specified PDP context (s) with repect to QoS profiles and TFTs. Possible Response(s): OK ERROR If no <**cid*i***> is specified the command modifies all active contexts. Parameters: <**cid*i***>: a numeric parameter which specifies a particular PDP context .
AT+CGCMOD?	Read command returns ERROR.
AT+CGCMOD=?	Test command returns a list of defined **<cid>**s.
Example	+CGCMOD: (list of <cid>s associated with active contexts) AT+CGCMOD? ERROR AT+CGCMOD = OK AT+CGCMOD =? +CGCMOD: OK AT+CGACT=1,1 OK AT+CGCMOD=? +CGCMOD: (1) OK AT+CGCMOD = OK AT+CGCMOD? ERROR

+CGCMOD – Modify PDP context	
Note	It is only used secondary PDP is activated.
Reference	3GPP TS 27.007

5.4.7.16. Define EPS Quality Of Service - +CGEQOS

+CGEQOS – Define EPS Quality Of Service	
AT+CGEQOS= **[<cid>** **[,<QCI> [,<DL_GBR>,** **<UL_GBR>** **[,<DL_MBR>,<UL_MBR]]]]**	This The set command allows the TE to specify the EPS Quality of Service parameters <**cid**>, <**QCI**>, [<**DL_GBR**> and <**UL_GBR**>] and [<**DL_MBR**> and <**UL_MBR**>] for a PDP context or Traffic Flows. When in UMTS/GPRS the MT applies a mapping function to UTMS Quality of Service This The set command allows the TE to specify the EPS Quality of Service parameters <**cid**>, <**QCI**>, [<**DL_GBR**> and <**UL_GBR**>] and [<**DL_MBR**> and <**UL_MBR**>] for a PDP context or Traffic Flows. When in UMTS the MT applies a mapping function to UTMS/GPRS Quality of Service **Possible Response(s):** +CME ERROR: <err> The set command allows the TE to specify the EPS Quality of Service parameters <**cid**>, <**QCI**>, [<**DL_GBR**> and <**UL_GBR**>] and [<**DL_MBR**> and <**UL_MBR**>] for a PDP context or Traffic Flows. When in UMTS/GPRS the MT applies a mapping function to UTMS Quality of Service. Refer subclause 9.2 for <err> values. A special form of the set command, **+CGEQOS= <cid>** causes the values for context number <**cid**> to become undefined. **<cid>** a numeric parameter which specifies a particular EPS Traffic Flows definition in EPS and a PDP Context. definition in UMTS/GPRS. **<QCI>** a numeric parameter specifies a class of EPS QoS. (see 3GPP TS 23.203 [85]) 0 - QCI is selected by network (default value) 1 - 4 value range for guranteed bit rate Traffic Flows 5 - 9 value range for non-guarenteed bit rate Traffic Flows **<DL_GBR>** a numeric parameter who indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) 0 - 150000 (default value : 0) **<UL_GBR>** a numeric parameter who indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) 0 - 50000 (default value : 0) **<DL_MBR>** a numeric parameter, indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) 0 - 150000 (default value : 0)

	<UL_MBR> a numeric parameter, indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) 0 - 50000 (default value : 0)
AT+CGEQOS?	The read command returns the current settings for each defined QoS. **+CGEQOS:<cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<CR>>LF>+CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][…]]**
AT+CGEQOS=?	The test command returns the ranges of the supported parameters. **+CGEQOS: (range of supported <cid>s) ,(list of supported <QCI>s) ,(list of supported <DL_GBR>s), (list of supported <UL_GBR>s), (list of supported <DL_MBR>s) ,(list of supported <UL_MBR>s)**
Example	AT+CGEQOS =? +CGEQOS: (1-16),(0-9),(0-150000),(0-50000),(0-150000),(0-50000)
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.7.17. PDP Context Read Dynamic Parameters - +CGCONTRDP

+CGCONTRDP PDP Context Read Dynamic Parameters	
AT+CGCONTRDP=[<cid>]	The execution command returns the relevant information: **<bearer_id>, <apn>, <ip_addr>, <subnet_mask>,<gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>** and **<P-CSCF_sec_addr>** for a non- secondary PDP Context established by the network with the primary context identifier <**cid**>. If the context can't be found an **ERROR** response is returned. If the parameter <**cid**> omitted, the relevant information for all established PDP contexts returned. **Possible response(s):** **+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<ip_addr>, <subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>]]]]][<CR><LF>+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<ip_addr>, <subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<PCSCF_prim_addr>[,<PCSCF_sec_addr>]]]]][…]]** NOTE**:** The dynamic part of the PDP context will only exist if established by the network. The test command returns a list of <cid>s associated with active contexts. **Defined values:** **<cid> -** a numeric parameter specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and used in other PDP context-related commands. **<bearer_id> -** a numeric parameter identifies the bearer, EPS Bearer in

	EPS and NSAPI in UMTS/GPRS. **<APN> -** a string parameter which is a logical name that was used to select the GGSN or the external packet data network. **<ip_addr> -** a string parameter shows the IP Address of the MT. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8" for IPv6. If the MT has dual stack capabilities the string shows first the dot separated IPv4 Address followed by the dot Separated IPv6 Global Prefix Address. The IPv4 address and the IPv6 address parameters are separated by space: "a1.a2.a3.a4 a1:a2:a3:a4:a5:a6:a7:a8" **<subnet_mask> -** a string parameter shows the subnet mask for the IP Address of the MT. The string given as dot-separated numeric (0-255) parameters. If the MT has dual stack capabilities the string shows the dot separated IPV4 subnet mask followed by the dot Separates IPV6 subnet mask. The subnet masks are separates by space. **<gw_addr> -** a string parameter shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Gateway address followed by the dot separated IPV6 Gateway Address. The gateway addresses are separated by space. **<DNS_prim_addr> -** a string parameter which shows the IP Address of the primary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server. **<DNS_sec_addr> -** a string parameter which shows the IP address of the secondary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server. **<P_CSCF_prim_addr> -** a string parameter which shows the IP Address of the primary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 primary Address of P-CSCF Server. **<P_CSCF_sec_addr> -** a string parameter which shows the IP Address of the secondary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of P-CSCF Server.
AT+CGCONTRDP?	Read command returns ERROR.
AT+CGCONTRDP=?	**+CGCONTRDP: (list of <cid>s associated with active contexts)**
Example	AT+CGACT=1,1

	OK AT+CGCONTRDP=? +CGCONTRDP: (1) AT+CGCONTRDP =1 +CGCONTRDP: 1,5,lte.ktfwing.com,"10.52.202.76",,"211.219.86.1","168.126.63.1"
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.7.18. Traffic Flow Template Read Dynamic Parameters - +CGTFTRDP

+CGTFTRDP Traffic Flow Template Read Dynamic Parameters	
AT+CGTFTRDP= [<cid>]	The execution command returns the relevant information about Traffic Flow Template of <**cid**> together with the additional network assigned values when established by the network. If the context can't be found, an ERROR response is returned. If the parameter <**cid**> omitted, the Traffic Flow Templates for all established PDP contexts returned. Parameters of both network and MT/TA initiated PDP contexts returned. **Possible Response(s):** **+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header(ipv6)>,<destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label ipv6)>, <direction>, <NW packet filter Identifier>[<CR><LF>** **+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>,<NW packet filter Identifier> […]]** **<cid>:** a numeric parameter which specifies a particular PDP context definition or Traffic Flows definition (see +CGDCONT command). The following parameters are defined in 3GPP TS 23.060 [47] - **<packet filter identifier>:** a numeric parameter. The value range is from 1 to 16. **<evaluation precedence index>:** a numeric parameter. The value range is from 0 to 255. **<source address and subnet mask>:** string type. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 **or** "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6. <protocol number (ipv4) / next header (ipv6)>: a numeric parameter, value range from 0 to 255.

	<destination port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t". **<source port range>:**string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t". **<ipsec security parameter index (spi)>:** numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF. **<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>:** string type. The string given as dot-separated numeric (0-255) parameters on the form "t.m". **<flow label (ipv6)>:** numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only. **<direction>** a numeric parameter which specifies the transmission direction in which the Packet Filter shall be applied. 0 - Pre Release 7 TFT Filter (see 3GPP TS 24.008 [8], table 10.5.162) 1 - Uplink 2 - Downlink 3 - Bidirectional (Used for Uplink and Downlink) **<NW packet filter Identifier>** a numeric parameter. In EPS the value is assigned by the network when established 1 – 16 NOTE: Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations listed on 3GPP TS 23.060 [47].
AT+CGTFTRDP=?	**+CGTFTRDP: (list of <cid>s associated with activecontexts) The test command returns a list of <cid>s associated with active contexts.**
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.7.19. EPS Quality of Service Read Dynamic Parameters - +CGEQOSRDP

+CGEQOSRDP EPS Quality Of Service Read Dynamic Parameters	
AT+CGEQOSRDP= [<cid>]	The execution command returns the Quality of Service parameters <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>]of the established PDP Context associated to the provided context identifier <cid>. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the Quality of Service parameters for all established PDP contexts are returned. **Possible Response(s):** **+CGEQOSRDP: <cid>, <QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<CR>> LF>+CGEQOSRDP: <cid>, <QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][…]]**

	Defined values: **<cid>:** a numeric parameter which specifies a particular Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS. **<QCI>:** a numeric parameter that specifies a class of EPS QoS. (see 3GPP TS 23.203 [85]) 0 - QCI is selected by network 1 – 4 guranteed bit rate Traffic Flows 5 – 9 non-guarenteed bit rate Traffic Flows. **<DL_GBR>:** a numeric parameter, which indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) **<UL_GBR>:** a numeric parameter which indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) **<DL_MBR>:** a numeric parameter which indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83]) **<UL_MBR>:** a numeric parameter which indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])**NOTE:** Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations listed on 3GPP TS 23.060 [47].
AT+CGEQOSRDP=?	**+CGEQOSRDP: (list of <cid>s associated with activecontexts)** The test command returns a list of <**cid**>s associated with active contexts. Parameters of both network and MT/TA initiated PDP contexts will be returned.
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.8. Commands For Battery Charger

5.4.8.1. 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 1 - **ME** has a battery connected, and charger pin is being powered 2 - **ME** does not have a battery connected 3 - Recognized power fault, calls inhibited **<bcl>** - battery charge level 0 - battery is exhausted, or **ME** does not have a battery connected 25 - battery charge remained is estimated to be 25% 50 - battery charge remained is estimated to be 50% 75 - battery charge remained is estimated to be 75% 100 - battery is fully charged. Note: There is not charger pin. So, **<bcs>=1** will never appear. Note: without battery/power connected on **VBATT** pins or during a power fault the unit is not working, therefore values **<bcs>=2** and **<bcs>=3** will never appear.
AT+CBC=?	Test command returns parameter values supported as a compound value. **+CBC: (0-3),(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

5.5. 3GPP TS 27.005 AT Commands for SMS and CBS

5.5.1. General Configuration

5.5.1.1. Select Message Service - +CSMS

+CSMS - Select Message Service	
AT+CSMS= <service>	Set command selects messaging service <**service**>. It returns the types of messages supported by the **ME**: Parameter: <**service**> 0 - The syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2 version 4.7.0 (factory default) 1 - The syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2+ version. Set command returns the types of messages supported by the **ME**: **+CSMS: <mt>,<mo>,<bm>** where: <**mt**> - mobile terminated messages support 0 - type not supported 1 - type supported <**mo**> - mobile originated messages support 0 - type not supported 1 - type supported <**bm**> - broadcast type messages support 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 (see above) <**mt**> - mobile terminated messages support (see above) <**mo**> - mobile originated messages support (see above) <**bm**> - broadcast type messages support (see above)
AT+CSMS=?	Test command reports the supported value of the parameter <**service**>.
Example	AT+CSMS=1 +CSMS: 1,1,1 OK

+CSMS - Select Message Service	
	AT+CSMS? +CSMS: 1,1,1,1 OK
Reference	3GPP TS 27.005; 3GPP TS 23.040; 3GPP TS 23.041

5.5.1.2. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	
AT+CPMS= <memr>[,<memw> [,<mems>]]	Set command selects memory storages **<memr>**, **<memw>** and **<mems>** to be used for reading, writing, sending and storing SMs. Parameters: **<memr>** - memory from which messages are read and deleted "ME" – SMS memory storage in Flash "SM" – SIM SMS memory storage (default) "SR" – Status Report message storage (in SIM EF-SMSR file exists, otherwise in the RAM non-volatile memory) Note: "SR" non-volatile memory is cleared when another SIM card is inserted. It is kept, even after a reset, while the same SIM card is inserted. **<memw>** - memory to which writing and sending operations are made "SM" – SIM SMS memory storage (default) "ME" – SMS memory storage in Flash **<mems>** - memory to which received SMs are preferred to be stored "SM" – SIM SMS memory storage (default) "ME" – SMS memory storage in Flash The command returns the memory storage status in the format: **+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>,<totals>** where: **<usedr>** - number of SMs stored into **<memr>** **<totalr>** - max number of SMs that **<memr>** can contain **<usedw>** - number of SMs stored into **<memw>** **<totalw>** max number of SMs that **<memw>** can contain **<useds>** - number of SMs stored into **<mems>** **<totals>** - max number of SMS that **<mems>** can contain
AT+CPMS?	Read command reports the message storage status in the format: **+CPMS: <memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>, <mems>,<useds>,<totals>** Where **<memr>**, **<memw>** and **<mems>** are the selected storage memories for reading, writing and storing respectively.

+CPMS - Preferred Message Storage	
AT+CPMS=?	Test command reports the supported values for parameters **<memr>**, **<memw>** and **<mems>**
Example	AT+CPMS? +CPMS: “ME”,27, 50, “ME”,27, 50, “SM”,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 (You have 1 out of 255 SMS SIM positions occupied)
Reference	3GPP TS 27.005

5.5.1.3. 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 23.040 and 3GPP TS 23.041 (factory 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

5.5.2. Message Configuration

5.5.2.1. Service Center Address - +CSCA

+CSCA -Service Center Address	
AT+CSCA= <number> [,<type>]	Set command sets the Service Center Address to be used for mobile originated SMS transmissions. Parameter: **<number>** - SC phone number in the format defined by **<type>** **<type>** - the type of number 129 - national numbering scheme 145 - international numbering scheme (contains the character “+”)

+CSCA -Service Center Address	
	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: <number>,<type>** Note: if SCA is not present the device reports an error message.
AT+CSCA=?	Test command returns the **OK** result code.
Example	AT+CSCA="821029190903",145 OK AT+CSCA? +CSCA: "+821029190903",145 OK
Reference	3GPP TS 27.005

5.5.2.2. 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 for storing and sending SMs when the text mode is used (**AT+CMGF=1**) Parameters: **<fo>** - first octet of 3GPP TS 23.040 SMS-SUBMIT or SMS-DELIVER, in integer format (default 17, i.e. SMS-SUBMIT with validity period in relative format). As first octet of a PDU has the following bit field description (**bit[7]bit[6]bit[5]bit[4]bit[3]bit[2]bit[1]bit[0]**): **bit[1]bit[0]**: Message Type Indicator, 2-bit field describing the message type; [00] - SMS-DELIVER; [01] - SMS-SUBMIT (default) ; **bit[2]**: Reject Duplicates, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]); **bit[4]bit[3]**: Validity Period Format, 2-bit field indicating whether or not the Validity Period field is present (default is [10]): [00] - Validity Period field *not present* [01] - Validity Period field present in *enhanced format* (i.e. quoted time-string type, see below) [10] - Validity Period field present in *relative format* (i.e. integer type, see below) [11] - Validity Period field present in *absolute format* (i.e. quoted time-string type, see below)

+CSMP - Set Text Mode Parameters	
	bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report (default is [0]); [0] - MS is not requesting a status report [1] - MS is requesting a status report **bit[6]**: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]); **bit[7]**: Reply Path, 1-bit field indicating the request for Reply Path (default is [0]); [0] - Reply Path not requested [1] - Reply Path requested <**vp**> - depending on <**fo**> setting: a) if <**fo**> asks for a *Not Present* Validity Period, <**vp**> can be any type and it will be not considered; b) if <**fo**> asks for a Validity Period in *relative format*, <**vp**> shall be integer type (default 167, i.e. 24 hours); 0..143 - (<**vp**> + 1) x 5 minutes 144..167 - 12 hours + ((<**vp**> - 143) x 30 minutes) 168..196 - (<**vp**> - 166) x 1 day 197..255 - (<**vp**> - 192) x 1 week c) if <**fo**> asks for a Validity Period in *absolute format*, <**vp**> shall be quoted time-string type (see **+CCLK**) d) if <**fo**> asks for a Validity Period in *enhanced format*, <**vp**> shall be the quoted hexadecimal representation (string type) of 7 octets, as follows: • the first octet is the **Validity Period Functionality Indicator**, indicating the way in which the other 6 octets are used; let's consider its bit field description: **bit[7]**: extension bit [0] - there are no more VP Functionality Indicator extension octets to follow **bit[6]**: Single Shot SM; [0] - the SC is not required to make up to one delivery attempt [1] - the SC is required to make up to one delivery attempt **bit[5]bit[4]bit[3]**: reserved [000] **bit[2]bit[1]bit[0]**: Validity Period Format [000] - No Validity Period specified [001] - Validity Period specified as for the relative format. The following octet contains the VP value as described before; all the other octets are 0's. [010] - Validity Period is relative in integer representation. The following octet contains the VP value in the range 0 to 255, representing 0 to 255 seconds; all the other octets are 0's. [011] - Validity Period is relative in semi-octet representation. The following 3 octets contain the relative time in Hours, Minutes and Seconds, giving the length of the validity period counted from when the SMS-SUBMIT is received by the SC; all the other octets are 0's.

+CSMP - Set Text Mode Parameters	
	<pid> - 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0). **<dcs>** - depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme Note: the current settings are stored through **+CSAS** Note: **<vp>**, **<pid>** and **<dcs>** default values are loaded from first SIM *SMS Parameters* profile, if present. If it is not present, then the default values are those above indicated.
AT+CSMP?	Read command reports the current setting in the format: **+CSMP: < fo>,<vp>,<pid>,<dcs>** Note: if the Validity Period Format (**<fo>**'s **bit[4]bit[3]**) is [00] (i.e. *Not Present*), **<vp>** is represented just as a quoted empty string (“”).
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 Set the parameters for an outgoing message with validity period in enhanced format: the **<vp>** string actually codes 24 hours of validity period. AT+CSMP=9,“01A80000000000” OK Set the parameters for an outgoing message with validity period in enhanced format: the **<vp>** string actually codes 60 seconds of validity period. AT+CSMP=9,“023C0000000000” OK Set the parameters for an outgoing message with validity period in enhanced format: the **<vp>** string actually codes 29 hours 85 minutes 30 seconds of validity period. AT+CSMP=9,“03925803000000” OK
Reference	3GPP TS 27.005; 3GPP TS 23.040; 3GPP TS 23.038

5.5.2.3. Show Text Mode Parameters - +CSDH

+CSDH - Show Text Mode Parameters	
AT+CSDH=[<show>]	Set command controls whether detailed header information is shown in text mode (**AT+CMGF=1**) result codes.

+CSDH - Show Text Mode Parameters	
	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

5.5.2.4. Select Cell Broadcast Message Types - +CSCB

+CSCB -Select Cell Broadcast Message Types	
AT+CSCB= **[<mode>[,<mids>** **[,<dcss>]]]**	Set command selects which types of Cell Broadcast Messages are to be received by the device. Parameters: **<mode>** 0 - the message types defined by **<mids>** and **<dcss>** are accepted (factory default) 1 - the message types defined by **<mids>** and **<dcss>** are rejected **<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? +CSCB: 1, “”, “” OK (all CBMs are accepted, none is rejected) AT+CSCB=0,“0,1,300-315,450”,“0-3” OK
Reference	3GPP TS 27.005, 3GPP TS 23.041, 3GPP TS 23.038.

5.5.2.5. 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 non-volatile memory.

+CSAS - Save Settings	
	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**>. Note: If parameter is omitted the settings are saved in the non-volatile memory.
AT+CSAS=?	Test command returns the possible range of values for the parameter <**profile**>.
Reference	3GPP TS 27.005

5.5.2.6. Restore Settings - +CRES

+CRES - Restore Settings	
AT+CRES [=<profile>]	Execution command restores message service settings saved by **+CSAS** command from either NVM or 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 NVM, regardless the value of <**profile**>. Note: If parameter is omitted the command restores message service settings from NVM.
AT+CRES=?	Test command returns the possible range of values for the parameter <**profile**>.
Reference	3GPP TS 27.005

5.5.2.7. 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 link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed and the parameter <n> is automatically reset to 0: the feature is disabled. 2 - Keep link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed but the parameter <n> remains set to 2: the feature is still enabled.

+CMMS – More Message to Send	
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

5.5.2.8. 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 will use to send MO SMS messages. Parameters: **<service>** -a numeric parameter which indicates the service or service preference to be used. 0 - Packet Domain 1 - Circuit switched (factory default) 2 - Packet Domain preferred (use circuit switched if Packet Domain is not available) 3 - Circuit switched preferred(use Packet Domain if circuit switched not available) Note: If SMS transfer via Packet Domain fails, <service> parameter are automatically reset to Circuit switched.
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

5.5.3. Message Receiving And Reading

5.5.3.1. 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 behaviour of the device on how the receiving of new messages from the network is indicated to the **DTE**. 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, otherwise forward them directly to the **TE**. 2 - Buffer unsolicited result codes in the TA in case the **DTE** is busy and flush them to the TE after reservation. Otherwise, forward them directly to the TE. 3 - if **<mt>** is set to 1, the hardware ring line enabled for 1 second when a SMS is received while the module is in online data mode.

+CNMI - New Message Indications To Terminal Equipment	
	<mt> - result code indication reporting for SMS-DELIVER 0 - No SMS-DELIVER indications are routed to the TE and message is stored. 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: <memr>,<index>** where: **<memr>** - 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. **<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 converted in the currently selected character set (see +CSCS) **<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 23.040 ***<pid>*** - Protocol Identifier ***<dcs>*** - Data Coding Scheme **<sca>** - Service Centre address, string type, converted in the currently selected character set (see +CSCS) ***<length>*** - text length **<data>** - TP-User-Data • If **<dcs>** indicates that 3GPP TS 23.038 default alphabet is used and **<fo>** indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set (bit 6 of **<fo>** is 0), each character of GSM/WCDMA alphabet

+CNMI - New Message Indications To Terminal Equipment	
	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 3GPP TS 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 **DTE** 2 - New Cell Broadcast Messages are sent to the **DTE** with the unsolicited result code: **(PDU Mode)** **+CBM: <length><CR><LF><PDU>** where: **<length>** - PDU length **<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 3GPP TS 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) **<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

+CNMI - New Message Indications To Terminal Equipment	
	<**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, represented in the currently selected character set (see +CSCS) <**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: <memr>,<index>** where: <**memr**> - memory storage where the new message is stored "SR" <**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..3** is entered (**OK** response shall be given before flushing the codes) 1 - **TA** buffer of unsolicited result codes defined within this command is cleared when <**mode**>**=1..3** is entered.
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
Note	**DTR** signal is ignored, hence the indication is sent even if the **DTE** is inactive (**DTR** signal is **Low**). In this case the unsolicited result code may be lost so if MODULE remains active while **DTE** is not, at **DTE** start-up is suggested to check whether new messages have reached the device meanwhile with command **AT+CMGL=0** that lists the new messages received.

5.5.3.2. List Messages - +CMGL

+CMGL - List Messages	
AT+CMGL [=<stat>]	Execution command reports the list of all the messages with status value **<stat>** stored into **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS). 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 **<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 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

+CMGL - List Messages	
	<stat> - message status **<oa/da>** - originator/destination address, string type , represented in the currently selected character set (see +CSCS) **<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 3GPP TS 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>,<ra>,<tora>,<scts>,<dt>,<st>** where **<index>** - message position in the storage **<stat>** - message status **<fo>** - first octet of the message PDU **<mr>** - message reference number **<ra>** - recipient address, string type , represented in the currently selected character set (see **+CSCS**) **<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 Note: If parameter is omitted the command returns the list of SMS with "**REC UNREAD**" status.
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"

+CMGL - List Messages	
	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

5.5.3.3. Read Message - +CMGR

+CMGR - Read Message	
AT+CMGR= <index>	Execution command reports the message with location value **<index>** from **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS). Parameter: **<index>** - message index. 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 23.040.

+CMGR - Read Message	
	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>,[<vp>],* *<sca>,<tosca>,<length>]*<CR><LF><data>** Output format for message delivery confirm: **+CMGR: <stat>,<fo>,<mr>,<ra>,<tora>,<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 **<ra>** - recipient address, string type, represented in the currently selected character set (see **+CSCS**) **<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 ***<pid>*** - Protocol Identifier ***<dcs>*** - Data Coding Scheme ***<vp>*** - depending on SMS-SUBMIT **<fo>** setting: Refer to 3GPP TS 23.040 TP-Validity-Period a) Not Present if <**fo**> tells that the Validity Period Format is **Not Present** b) Integer type if <**fo**> tells that the Validity Period Format is **Relative** (default 167) c) Quoted time-string type if <**fo**> tells that the Validity Period Format is **Absolute** d) Quoted hexadecimal representation of 7 octets if <**fo**> tells that the Validity Period Format is **Enhanced**. **<oa>** - Originator address, string type represented in the currently selected character set (see +CSCS) **<da>** - Destination address, string type represented in the currently selected character set (see +CSCS) **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one

+CMGR - Read Message	
	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 3GPP TS 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: in both cases if status of the message is 'received unread', status in the storage changes to 'received read'.
AT+CMGR=?	Test command returns the **OK** result code
Example	AT+CMGF=0 OK AT+CMGR=1 OK +CMGR: 2,,21 0791280192919030116 40A8110516529700000A709027A794E77B95C2E 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

5.5.3.4. 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. Acknowledge with +CNMA is possible only if the +CSMS parameter is set to 1(+CSMS=1) when a +CMT or +CDS indication is show. If no acknowledgement is given within the network timeout, an RP-ERROR is sent to the network, the <mt> and <ds> parameters of the +CNMI command are then reset to zero (do not show new message indication). Either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the

+CNMA – New Message Acknowledgement	
	network is possible. 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>
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 0681600058542600048098060 0F170110370537284… Send positive acknowledgement to the network. AT+CNMA=0 OK Message is received from network. +CMT: “”,70 0681600058542600048098060 0F170110370537284… Send negative acknowledgement (Unspecified error) to the network. AT+CNMA=2,3<CR> > 00FF00 <Ctrl-Z> OK

+CNMA – New Message Acknowledgement	
	(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

5.5.4. Message Sending And Writing

5.5.4.1. 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 PDU to be sent in bytes (excluding the SMSC address octets). 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 **DCD** signal shall be in **ON** state while PDU is given. Note: the echoing of given characters back from the TA is controlled by echo command **E**

+CMGS - Send Message	
	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 **+CSCA** is used, in this case, the SMSC Type-of-Address octet shall not be present in the **PDU**. 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: <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: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.
(Text Mode) **AT+CMGS=<da>[,<toda>]**	**(Text Mode)** Execution command sends to the network a message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +CSCS). **<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 current **<dcs>** (see +CSMP) indicates that 3GPP TS 23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM/WCDMA alphabet, according to 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used.

+CMGS - Send Message	
	- if current **<dcs>** (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see +CSMP) indicates that 3GPP TS 23.040 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. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) Note: the **DCD** signal shall be in **ON** state while text is entered. Note: the echoing of entered characters back from the TA is controlled by echo command **E** 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: <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: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued. Note: it is possible to send a concatenation of at most 10 SMs; the maximum number of chars depends on the **<dcs>**: 1520 chars if 3GPP TS 23.038 default alphabet is used, 1330 chars if 8-bit is used, 660 chars if UCS2 is used
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 OK AT+CMGS=18 > 08812801009901025911550B811020905512F90000A704F4F29C0E +CMGS: 124 OK Set text mode AT+CMGF=1

+CMGS - Send Message	
	OK AT+CSMP=17,167,0,0 OK AT+CMGS="01090255219",129 >TEST MESSAGE +CMGS:125 OK
Reference	3GPP TS 27.005

5.5.4.2. Send Message From Storage - +CMSS

+CMSS - Send Message From Storage	
AT+CMSS= <index>[,<da> [,<toda>]]	Execution command sends to the network a message that is already stored in the **<memw>** storage (see **+CPMS**) at the location **<index>**. Parameters: **<index>** - location value in the message storage **<memw>** of the message to send **<da>** - destination address, string type represented in the currently selected character set (see **+CSCS**); 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: (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. If message sending fails for some reason, an error code is reported: **+CMS ERROR:<err>** Note: to store a message in the **<memw>** storage see command **+CMGW.** Note: care must be taken to ensure that during the command execution, which may take several seconds, no other **SIM** interacting commands are issued.
AT+CMSS=?	Test command returns 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...

+CMSS - Send Message From Storage	
	+CMGW: 28 OK AT+CMSS=28 +CMSS: 136 OK
Reference	3GPP TS 27.005

5.5.4.3. Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	
(PDU Mode) **AT+CMGW=** **<length>** **[,<stat>]**	**(PDU Mode)** Execution command writes in the **<memw>** 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 **<memw>**. 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 **<memw>** memory storage a new message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +CSCS).

+CMGW - Write Message To Memory	
	<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 "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 current **<dcs>** (see +CSMP) indicates that 3GPP TS 23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM/WCDMA alphabet, according to 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used. - if current **<dcs>** (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see +CSMP) indicates that 3GPP TS 23.040 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. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) Note: the **DCD** signal shall be in ON state while text is entered. Note: the echoing of entered characters back from the TA is controlled by echo command **E** 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 **<memw>**. If message storing fails for some reason, an error code is reported.

+CMGW - Write Message To Memory	
	Note: care must be taken to ensure that during the command execution, no other SIM interacting commands are issued. Note: it is possible to save a concatenation of at most 10 SMs; the maximum number of chars depends on the **<dcs>**: 1520 chars if 3GPP TS 23.038 default alphabet is used, 1330 chars if 8-bit is used, 660 chars if UCS2 is used
AT+CMGW=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.005
Example	AT+CMGF=0 Set PDU mode OK AT+CMGW=18 > 088128010099010259115508811020905512F90000A704F4F29C0E +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 OK
Note	To avoid malfunctions is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

5.5.4.4. Delete Message - +CMGD

+CMGD - Delete Message	
AT+CMGD= <index> [,<delflag>]	Execution command deletes from memory **<memr>** the message(s). Parameter: **<index>** - message index in the selected storage **<memr>** **<delflag>** - an integer indicating multiple message deletion request. 0 (or omitted) - delete message specified in **<index>** 1 - delete all read messages from **<memr>** storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched 2 - delete all read messages from **<memr>** storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched 3 - delete all read messages from **<memr>** storage, sent and unsent mobile originated messages, leaving unread messages untouched 4 - delete all messages from **<memr>** storage.

+CMGD - Delete Message	
	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)]**
Example	AT+CMGD=? +CMGD: (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=10 Delete message in 10th record OK AT+CMGD=1,4 Delete all messages OK
Reference	3GPP TS 27.005

5.5.5. 3GPP2 AT Commands for SMS

The commands in this section are valid only if #SMSFORMAT is set to 1.

5.5.5.1. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	
AT+CPMS=<memr>[,<memw>]	Set command selects memory storages **<memr>**, **<memw>** to be used for reading, writing, sending and storing SMs. Parameters: **<memr>** - memory from which messages are read and deleted "ME" – SMS memory storage into module "SM" – SIM SMS memory storage (default) **<memw>** - memory to which writing and sending operations are made "ME" – SMS memory storage into module "SM" – SIM SMS memory storage (default) The command returns the memory storage status in the format: **+CPMS: <usedr>,<totalr>,<usedw>,<totalw>** where: **<usedr>** - number of SMs stored into **<memr>** **<totalr>** - max number of SMs that **<memr>** can contain **<usedw>** - number of SMs stored into **<memw>** **<totalw>** max number of SMs that **<memw>** can contain
AT+CPMS?	Read command reports the message storage status in the format: **+CPMS: <memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>**

+CPMS - Preferred Message Storage	
	where **<memr>**, **<memw>** are the selected storage memories for reading, writing and storing respectively.
AT+CPMS=?	Test command reports the supported values for parameters **<memr>**, **<memw>**
Example	AT+CPMS=? +CPMS: (“ME”,“SM”),(“ME”,“SM”) OK AT+CPMS? +CPMS: “ME”,5,99, “ME”,5,99 OK AT+CPMS=“ME”, “ME” +CPMS: 5,99,5,99 OK AT+CPMS? +CPMS: “ME”,5,99, “ME”,5,99 OK AT+CPMS=“SM”, “SM” +CPMS: 2,20,2,20 OK AT+CPMS? +CPMS: “SM”,2,20,“SM”,2,20 OK

5.5.5.2. Set Text Mode Parameters - +CSMP

+CSMP - Set Text Mode Parameters	
AT+CSMP= **[<callback_addr>** **[,<tele_id >** **[,<priority>** **[,<enc_type >]]]]**	Set command is used to select values for additional parameters for storing and sending SMs when the text mode is used (**AT+CMGF=1**) Parameters: **<callback_addr>** - Callback address. Note: The maximum length is 32 characters Note: Initially, this parameter is null. Some carrier networks discard SMS's without a callback number. Therefore, we recommend that customer setup callback number using AT+CSMP command. **<tele_id>** - Teleservice ID 4097 - page 4098 - SMS message (factory default) **<priority>** - Priority

+CSMP - Set Text Mode Parameters	
	0 - Normal (factory default) 1 - Interactive 2 - Urgent 3 - Emergency **<enc_type>** - data coding scheme: 0 - 8-bit Octet 2 - 7-bit ASCII (factory default) 4 - 16-bit Unicode Note: the current settings are stored through **+CSAS**
AT+CSMP?	Read command reports the current setting in the format: **+CSMP: < callback_addr >,<tele_id >,< priority >,< enc_type >**
AT+CSMP=?	Test command returns the **OK** result code.
Example	AT+CSMP=? OK AT+CSMP? +CSMP: “”,4098,0,2 OK AT+CSMP=“1234567890”,4097,1,2 OK AT+CSMP? +CSMP: “1234567890”,4097,1,2 OK

5.5.5.3. Save Settings - +CSAS

+CSAS - Save Settings	
AT+CSAS [=<profile>]	Execution command saves settings made by, +**CSMP** command in local non-volatile memory Parameter: **<profile>** 0,1 - it saves the settings to NVM. Note: If parameter is omitted the settings are saved to profile 0 in the non-volatile memory.
AT+CSAS=?	Test command returns the possible range of values for the parameter **<profile>**.
Example	AT+CSAS=? +CSAS: (0,1) OK AT+CSAS OK AT+CSAS=1

+CSAS - Save Settings	
	OK AT+CSAS=0 OK

5.5.5.4. Restore Settings - +CRES

+CRES - Restore Settings	
AT+CRES [=<profile>]	Execution command restores message service settings saved by **+CSAS** command from NVM. Parameter: **<profile>** 0,1 - it restores message service settings from NVM. Note: If parameter is omitted the command restores message service settings from Profile 0 in the non-volatile memory.
AT+CRES=?	Test command returns the possible range of values for the parameter **<profile>**.
Example	AT+CRES=? +CRES: (0,1) OK AT+CRES=0 OK AT+CRES=1 OK

5.5.5.5. New Message Indications To Terminal Equipment - +CNMI

+CNMI - New Message Indications To Terminal Equipment	
AT+CNMI=[<mt>]	Set command selects the behaviour of the device on how the receiving of new messages from the network is indicated to the **DTE**. Parameter: **<mt>** - The information written in italics will be present depending on +**CSDH** last setting. Unsolicited result codes buffering option 0 - No Indication (factory default) 1 - Indicate like below **+CMTI: <memr>,<index>** **<memr>** - memory storage where the new message is stored "ME" **<index>** - location on the memory where SMS is stored. 2 - Indicate like below (**PDU Mode**) **+CMT: ,<length><CR><LF><pdu>**

+CNMI - New Message Indications To Terminal Equipment	
	<length> - PDU length **<pdu>** - PDU Message **<pdu>:** **<orig_num><date><tele_id><priority><enc_type><udh><length><data>** where: **<orig_num> : <addr_len><tooa><address>** **<addr_len>** : Octets length of address field(1 Octet : <tooa> and <address>). **<tooa>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<date>** : Serivce center time stamp (6 Octets : YYMMDDHHMMSS). **<tele_id>** : Teleservice ID (2 Octets). **<priority>** : Priority(1 Octet). **<enc_type>** : Encoding type(1 Octet). **<udh>** : User data header (1 Octet). **<length>** : Refer to below **Note** (1 Octet). **<data>** : User data of message. Note: In **<pdu>:** **<orig_num><date><tele_id><priority><enc_type><udh><length><data>,** If user data header**<udh>** is present, If encoding type is 7bit ASCII, **<length>** value is the sum of the number of septets in user data and the number of septets in user data header (including any padding). Otherwise, **<length>** value is the sum of the number of octets in user data and the number of octets in user data header. If user data header**<udh>** is not present, If encoding type is 7bit ASCII, **<length>** value is the number of septets in user data. Otherwise, **<length>** value is the number of octets in user data. (**TEXT Mode**) **+CMT:** **<orig_num>,<callback>,<date>[,<tooa>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]<CR><LF><data>** **<orig_num>** - Origination number. **<callback>** - Callback number. **<date>** - Received date in form as "YYYYMMDDHHMMSS". **<tooa>** - Type of <**orig_num**>. **<tele_id>** - Teleservice ID.

+CNMI - New Message Indications To Terminal Equipment	
	4097 - page 4098 - SMS message 4099 - voice mail notification 262144 - voice mail notification **<priority>** - Priority. 0 - Normal (factory default) 1 - Interactive 2 - Urgent 3 - Emergency **<enc_type>** - Encoding type of message. 0 - 8-bit Octet 2 - 7-bit ASCII 4 - 16-bit Unicode **<udh>** - User data header 0 - Not present the user data header 1 - Present the user data header **<length>** - Length of message. **<data>** - Message data. (Indicates the new voice mail count, if <tele_id> is voice mail notification) Note : Regardless of <mt>, a message is saved in SMS memory storage.
AT+CNMI?	Read command returns the current parameter settings for **+CNMI** command in the form: **+CNMI: <mt>**
AT+CNMI=?	Test command reports the supported range of values for the **+CNMI** command parameters.
Example	AT+CNMI=? +CNMI: (0-2) OK AT+CNMI=1 OK AT+CNMI? +CNMI: 1 OK +CMTI:“ME”,98 AT+CNMI=2 OK AT+CNMI? +CNMI: 2 OK +CMT: “My Number”,“My Number”,20141023165007,129,4098,0,2,0,8 TEST SMS

5.5.5.6. List Messages - +CMGL

+CMGL - List Messages	
AT+CMGL [=<stat>]	Execution command reports the list of all the messages with status value **<stat>** stored into **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS). 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>,"",<length><CR><LF><pdu>** Case of received message from base station : **<PDU>:** **<orig_num><date><tele_id><priority><enc_type><udh><length><data>** Case of sending message to base station: **<PDU>:** **<da><callback><tele_id><priority><enc_type><udh><length><data>** where: **<orig_num> : <addr_len><tooa><address>** **<addr_len>** : Octets length of address field(1 Octet : <tooa> and <address>). **<tooa>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<da> : <addr_len><toda><address>** **<addr_len>** : Octets length of address field(1 Octet : <toda> and <address>). **<toda>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<callback> : <addr_len><toca><address>** **<addr_len>** : Octets length of address field(1 Octet : <toca> and <address>). **<toca>** : Type of address(1 Octet).

+CMGL - List Messages	
	<addres> : Address digits with representation of semi-octets. **<date>** : Serivce center time stamp (6 Octets : YYMMDDHHMMSS). **<tele_id>** : Teleservice ID (2 Octets). **<priority>** : Priority (1 Octet). **<enc_type>** : Encoding type (1 Octet). **<udh>** : User data header (1 Octet). **<length>** : Refer to below **Note** (1 Octet). **<data>** : User data of message. Note: If user data header**<udh>** is present, If encoding type is 7bit ASCII, **<length>** value is the sum of the number of septets in user data and the number of septets in user data header (including any padding). Otherwise, **<length>** value is the sum of the number of octets in user data and the number of octets in user data header. If user data header**<udh>** is not present, If encoding type is 7bit ASCII, **<length>** value is the number of septets in user data. Otherwise, **<length>** value is the number of octets in user data. where: **<index>** - message position in the memory storage list. **<stat>** - status of the message **<length>** - length of the PDU in bytes **<pdu>** - message in PDU format **(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): If there is at least a **Received** message to be listed the representation format is: **+CMGL:** **<index>,<stat>,<orig_num>,<callback>,<date>*[,<tooa>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]*<CR><LF> <data>**

+CMGL - List Messages	
	If there is at least a **Sent** or an **Unsent** message to be listed the representation format is: **+CMGL:** **<index>,<stat>,<da>,<callback>,*[*,<*toda*>,<*tele_id*>,<*priority*>,<*enc_type*>,<*udh*>,<*length*>*]*<CR><LF><data>** Where **<orig_num>** - Origination number. **<callback>** - Callback number. **<date>** - Received date in form as "YYYYMMDDHHMMSS". **<tooa>** - Type of <**orig_num**>. **<*toda*>** - Type of <**da**>. **<*tele_id*>** - Teleservice ID. 4097 - page 4098 - SMS message 4099 - voice mail notification 262144 - voice mail notification **<*priority*>** - Priority. 0 - Normal (factory default) 1 - Interactive 2 - Urgent 3 - Emergency **<*enc_type*>** - Encoding type of message. 0 - 8-bit Octet 2 - 7-bit ASCII 4 - 16-bit Unicode **<*udh*>** - User data header 0 - Not present the user data header 1 - Present the user data header **<*length*>** - Length of message. **<data>** - Message data. (Indicates the new voice mail count, if <tele_id> is voice mail notification) Note: If a message is present when +CMGL="ALL" is used it will be changed status from **REC UNREAD** to **REC READ**.
AT+CMGL=?	Test command returns a list of supported **<stat>**s
Example	**(PDU Mode)** Case of received message from base station: AT+CMGL=1 +CMGL: 13,1,"",51 0681104139430614102315582010020202002 4C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 OK 06 <addr_len: 6byte> 81 <type_addr: 129>

+CMGL - List Messages	
	1041394306 <Origination number: 0114933460> 141023155820 <Date: 14/10/23,15:58:20> 1002 <Teleservice_id: 4098(decimal)> 02 <priority: urgent > 02 <encoding_type: 7-bit ASCII > 00 <udh: Not present user data header > 24 <data_len: 36> C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E 10 <user_data: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa> Else: AT+CMGL=2 +CMGL: 31,2,“”,23 07801091346554F307801091346554F310020000000A61616161616161616161 OK 07 <addr_len: 7byte> 81 <type_addr:129> 1091346554F3 <Destination_addr: 01194356453> 07 <addr_len: 7byte> 81 <type_addr:129> 1096224658F1 <Callback_Number: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: 8-bit Octet > 00 <udh: Not present user data header > 0A <data_len: 10> 6161616161616161616 <data: aaaaaaaaaa> AT+CMGF=0 OK AT+CMGF? +CMGF: 0 OK AT+CMGL=? (0-4) OK AT+CMGL=4 +CMGL: 0,2,“”,19 0681104139430606811041394306100200000006313233343536 +CMGL: 1,2,“”,22 06811041394306068110413943061002000000093132333435363637 37 +CMGL: 2,2,“”,25 0681104139430606811041394306100200000000C3131323233343434343434

+CMGL - List Messages	
	+CMGL: 3,2,“”,28 06811041394306068110413943061002000000F6166666173646565656565656565 565 OK **(Text Mode)** AT+CMGF=1 OK AT+CMGF? +CMGF: 1 OK AT+CMGL=? (“REC UNREAD”,“REC READ”,“STO UNSENT”,“STO SENT”,“ALL”) OK AT+CMGL=“ALL” +CMGL: 0,“STO UNSENT”,“My Number”,“My Number”, 123456 +CMGL: 1, “STO UNSENT”,“My Number",“My Number”, 123456677 +CMGL: 2, “STO UNSENT”,“My Number",“My Number”, 112234444444 +CMGL: 3, “STO UNSENT”,“My Number",“My Number”, affasdeeeeeeeee OK

5.5.5.7. Read Message - +CMGR

+CMGR - Read Message	
AT+CMGR= <index>	Execution command reports the message with location value **<index>** from **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS). Parameter: **<index>** - message index. The output depends on the last settings of command **+CMGF** (message format to be used) **(PDU Mode)** If there is at least one message to be listed the representation format is: **+CMGR:<stat>,"",<length><CR><LF><PDU>** Case of received message from base station : **<PDU>:** **<orig_num><date><tele_id><priority><enc_type><udh><length><data>**

+CMGR - Read Message	
	Case of sending message to base station: **<PDU>:** **<da><callback><tele_id><priority><enc_type><udh><length><data>** where: **<orig_num> : <addr_len><tooa><address>** **<addr_len>** : Octets length of address field(1 Octet : <tooa> and <address>). **<tooa>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<da> : <addr_len><toda><address>** **<addr_len>** : Octets length of address field(1 Octet : <toda> and <address>). **<toda>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<callback> : <addr_len><toca><address>** **<addr_len>** : Octets length of address field(1 Octet : <toca> and <address>). **<toca>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<date>** : Serivce center time stamp (6 Octets: YYMMDDHHMMSS). **<tele_id>** : Teleservice ID (2 Octets). **<priority>** : Priority(1 Octet). **<enc_type>** : Encoding type(1 Octet). **<udh>** : User data header (1 Octet). **<length>** : Refer to below **Note**(1 Octet). **<data>** : User data of message. Note: If user data header**<udh>** is present, If encoding type is 7bit ASCII, **<length>** value is the sum of the number of septets in user data and the number of septets in user data header (including any padding). Otherwise, **<length>** value is the sum of the number of octets in user data and the number of octets in user data header. If user data header**<udh>** is not present, If encoding type is 7bit ASCII, **<length>** value is the number of septets in user data. Otherwise, **<length>** value is the number of octets in user data.

+CMGR - Read Message	
	where <**stat**> - status of the message 0 - new message 1 - read message 2 - stored message not yet sent 3 - stored message already sent <**length**> - length of the PDU in bytes. <**pdu**> - message in PDU format **(Text Mode)** Output format for received messages (the information written in *italics* will be present depending on **+CSDH** last setting)*:* Output format for message delivery confirm: **+CMGR:** **<stat>,<orig_num>,<callback>,<date>*[,<tooa>,<tele_id>,<priority>,<enc_type>,<udh>,<length>*]<CR><LF><data>** If there is either a **Sent** or an **Unsent** message in location <index> the output format is: **+CMGR:** **<stat>,<da>,<callback>*[,<toda>,<tele_id>,<priority>,<enc_type>,<udh>,<length>*]<CR><LF><data>** 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 <**orig_num**> - Origination number. <**callback**> - Callback number. <**date**> - Received date in form as "YYYYMMDDHHMMSS". <***tooa***> - Type of <**orig_num**>. <***toda***> - Type of <**da**>. <***tele_id***> - Teleservice ID. 4097 - page 4098 - SMS message 4099 - voice mail notification 262144 - voice mail notification <***priority***> - Priority. 0 - Normal (factory default) 1 - Interactive 2 - Urgent 3 - Emergency <***enc_type***> - Encoding type of message.

+CMGR - Read Message	
	0 - 8-bit Octet 2 - 7-bit ASCII 4 - 16-bit Unicode **<*udh*>** - User data header 0 - Not present the user data header 1 - Present the user data header **<*length*>** - Length of message. **<data>** - Message data. (Indicates the new voice mail count, if <tele_id> is voice mail notification)
AT+CMGR=?	Test command returns the **OK** result code
Example	**(PDU Mode)** Case of received message from base station: AT+CMGR=29 +CMGR: 1,“”,51 0681104139430614102315582010020202002 4C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 OK 06 <addr_len: 6byte> 81 <type_addr: 129> 1041394306 <Origination number: 0114933460> 141023155820 <Date: 14/10/23,15:58:20> 1002 <Teleservice_id: 4098(decimal)> 02 <priority: urgent > 02 <encoding_type: 7-bit ASCII > 00 <udh: Not present user data header > 24 <data_len: 36 > C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 <user_data: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa> Else: AT+CMGR=31 +CMGR: 2,“”,23 07801091346554F307801091346554F310020000000A6161616161616161616161 OK 07 <addr_len: 7byte> 81 <type_addr:129> 1091346554F3 <Destination_addr: 01194356453> 07 <addr_len: 7byte> 81 <type_addr:129> 1096224658F1 <Callback_Number: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: 8-bit Octet >

+CMGR - Read Message	
	00 <udh: Not present user data header > 0A <data_len: 10> 61616161616161616161 <data: aaaaaaaaaa> **(Text Mode)** AT+CSDH=1 OK AT+CMGR=1 +CMGR: “REC READ”, “0114933460”, “01149334690”, 20140109180259, 129, 4098,0,2,0,12 TEST MESSAGE OK AT+CMGR=4 +CMGR: “STO UNSENT”,“0114933460”,“0114933460”,,129,4098,0,0,0,12 TEST MESSAGE OK

5.5.5.8. Send Message - +CMGS

+CMGS - Send Message	
(PDU Mode) **AT+CMGS= <length>**	**(PDU Mode)** Execution command sends to the network a message. 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. Parameter: **<length>** - length of the PDU to be sent in bytes (excluding the Destination Address octets). 5..183 Note: the echoing of given characters back from the TA is controlled by echo command **E** 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. 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:

+CMGS - Send Message	
	+CMGS: <mr> where **<mr>** - message reference number. Note: If message sending fails for some reason, an error code is reported. Note: The maximum number of characters in a MO SMS message shall be 70 if 16 bit Unicode character encoding is used. The maximum number of characters in a MO SMS message shall be 140 if 8bit character encoding is used. The maximum number of characters in a MO SMS message shall be 160 if 7bit character encoding is used.
Example	**(PDU Mode)** AT+CMGF=0 OK AT+CMGS=36 >07811091346554F307811096224658F1100200001662626262626262626262626262626262626262626262 +CMGS: 4 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <Destination_address:01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129> 1096224658F1 <callback_address:01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: octet > 00 <udh: Not present user data header > 16 <data_len: 22> 626262626262626262626262626262626262626262 <user_data: bbbbbbbbbbbbbbbbbbbbbb> AT+CMGS=32 >07811091346554F307811091346554F3100202020014C3870E1C3870E1C387162C58B162C58B1620 +CMGS: 3 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <destination_address:01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129>

+CMGS - Send Message	
	1091346554F3 <callback_address: 01194356453> 1002 <Teleservice_id: 4098(decimal)> 02 <priority: ungent > 02 <encoding_type: 7-bit ASCII > 00 <udh: Not present user data header > 14 <data_len: 20> C3870E1C3870E1C387162C58B162C58B1620 <user_data: aaaaaaaaaabbbbbbbbbb> Note: If user data header<udh> is present, If encoding type is 7bit ASCII, <data_len> value is the sum of the number of septets in user data and the number of septets in user data header (including any padding). Otherwise, <data_len> value is the sum of the number of octets in user data and the number of octets in user data header. If user data header<udh> is not present, If encoding type is 7bit ASCII, <data_len> value is the number of septets in user data. Otherwise, <data_len> value is the number of octets in user data.
(Text Mode) **AT+CMGS=<da>[,<toda>]**	**(Text Mode)** Execution command sends to the network a message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +CSCS); ASCII characters in the set (0 9), #,*; Maximum length is 32 characters **<toda>** - type of destination address 129 - number in national format 145 - number in international format (contains the "+") 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: **+CMGS: <mr>** where **<mr>** - message reference number. Note: if message sending fails for some reason, an error code is reported. Note: To discard SMS, press the "ESC" key, an "OK" response will be returned.

+CMGS - Send Message	
	Note: The maximum number of characters in a MO SMS message shall be 70 if 16 bit Unicode character encoding is used. The maximum number of characters in a MO SMS message shall be 140 if 8bit character encoding is used. The maximum number of characters in a MO SMS message shall be 160 if 7bit character encoding is used.
AT+CMGS=?	Test command returns 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	**(Text Mode)** AT+CMGF=1 OK AT+CMGS="9194547830" > Test SMS +CMGS: 1 OK

5.5.5.9. Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	
(PDU Mode) **AT+CMGW= <length> [,<stat>]**	**(PDU Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameter: **<length>** - length in bytes of the PDU to be written. (excluding the Destination Address octets) 5..183 **<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 **<memw>**.

+CMGW - Write Message To Memory	
	If message storing fails for some reason, an error code is reported. Note: The maximum number of characters in a MO SMS message shall be 70 if 16 bit Unicode character encoding is used. The maximum number of characters in a MO SMS message shall be 140 if 8bit character encoding is used. The maximum number of characters in a MO SMS message shall be 160 if 7bit character encoding is used.
Example	**<PDU Mode>** AT+CMGF=0 OK AT+CMGW=36 >07811091346554F307811096224658F1100200000016626262626262626262626262626262626262626262 +CMGW: 4 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <Destination_address: 01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129> 1096224658F1 <callback_address: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: octet > 00 <udh: Not present user data header > 16 <data_len: 22> 62626262626262626262626262626262626262626262 <user_data: bbbbbbbbbbbbbbbbbbbbbb> Note: If user data header<udh> is present, If encoding type is 7bit ASCII, <data_len> value is the sum of the number of septets in user data and the number of septets in user data header (including any padding). Otherwise, <data_len> value is the sum of the number of octets in user data and the number of octets in user data header. If user data header<udh> is not present, If encoding type is 7bit ASCII, <data_len> value is the number of septets in user data. Otherwise, <data_len> value is the number of octets in user data.
(Text Mode) **AT+CMGW[=<da>[,<toda>[,<stat>]]]**	**(Text Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameters:

+CMGW - Write Message To Memory	
	<da> - destination address, string type represented in the currently selected character set (see +CSCS); ASCII characters in the set (0 9), #,*; Maximum length is 32 characters **<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 "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)** Note: the echoing of entered characters back from the TA is controlled by echo command **E** 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 **<memw>**. If message storing fails for some reason, an error code is reported. Note: To discard SMS, press the "ESC" key, an "OK" response will be returned. Note: The maximum number of characters in a MO SMS message shall be 70 if 16 bit Unicode character encoding is used. The maximum number of characters in a MO SMS message shall be 140 if 8bit character encoding is used. The maximum number of characters in a MO SMS message shall be 160 if 7bit character encoding is used.
AT+CMGW=?	Test command returns the **OK** result code.
Example	**(Text Mode)** AT+CMGW=? OK

+CMGW - Write Message To Memory	
	AT+CMGF=1 OK AT+CMGW > Test message > Ctrl+Z must be used to write message +CMGW: 1 OK AT+CMGW="9194397977" > Test SMS +CMGW: 2 OK AT+CMGW="9194397977",129 > Test SMS +CMGW: 3 OK
Note	To avoid malfunctions is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

5.6. Telit Custom AT Commands

5.6.1. General Configuration AT Commands

5.6.1.1. Network Selection Menu Availability - +PACSP

+PACSP – Network Selection Menu Availability	
AT+PACSP?	Read command returns the current value of the <mode> parameter in the format: **+PACSP<mode>** **where:** **<mode>** - PLMN mode bit (in CSP file on the SIM) 0 - restriction of menu option for manual PLMN selection. 1 - no restriction of menu option for Manual PLMN selection
AT+PACSP=?	Test command returns the OK result code.

5.6.1.2. Manufacturer Identification - #CGMI

#CGMI - Manufacturer Identification	
AT#CGMI	Execution command returns the device manufacturer identification code with command echo.
AT#CGMI=?	Test command returns the **OK** result code.

#CGMI - Manufacturer Identification	
Example	AT#CGMI #CGMI: Telit OK

5.6.1.3. Model Identification - #CGMM

#CGMM - Model Identification	
AT#CGMM	Execution command returns the device model identification code with command echo.
AT#CGMM=?	Test command returns the **OK** result code.

5.6.1.4. Revision Identification - #CGMR

#CGMR - Revision Identification	
AT#CGMR	Execution command returns device software revision number with command echo.
AT#CGMR=?	Test command returns the **OK** result code.

5.6.1.5. Product Serial Number Identification - #CGSN

#CGSN - Product Serial Number Identification	
AT#CGSN	Execution command returns the product serial number, identified as the IMEI of the mobile, with command echo.
AT#CGSN=?	Test command returns the **OK** result code.

5.6.1.6. International Mobile Subscriber Identity (IMSI) - #CIMI

#CIMI - International Mobile Subscriber Identity (IMSI)	
AT#CIMI	Execution command returns the international mobile subscriber identity, identified as the IMSI number, with command echo.
AT#CIMI=?	Test command returns the **OK** result code.
Example	AT#CIMI #CIMI: 450050209516643 OK

5.6.1.7. 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 #CCID: 89820507021001676 84F

#CCID - Read ICCID	
	OK

5.6.1.8. Service Provider Name - #SPN

#SPN - Service Provider Name	
AT#SPN	Execution command returns the service provider string contained in the SIM field **SPN**, in the format: **#SPN: <spn>** where: **<spn>** - service provider string contained in the SIM field **SPN**, represented in the currently selected character set (see **+CSCS**). Note: if the SIM field SPN is empty, the command returns just the **OK** result code
AT#SPN=?	Test command returns the **OK** result code.

5.6.1.9. Update PLMN List - #PLMNUPDATE

#PLMNUPDATE – Update PLMN List	
AT#PLMNUPDATE=[<action>,<MCC>,<MNC>[,<PLMNname>]]	Set command adds a new entry or updates an existing entry of the module PLMN list. Parameter: **<action>** - command action 0 - remove the entry with selected <MCC> and <MNC>. Parameter <PLMNname> will be ignored 1 - update the entry with selected <MCC> and <MNC> if it is already present, otherwise add it. 2 – remove all entries. Parameters <MCC> and <MNC> are not used in this case. **<MCC>** - Mobile Country Code. String value, length 3 digits. **<MNC>** - Mobile Network Code. String value, min length 2 digits, max length 3 digits. **<PLMNname>** - Name of the PLMN; string value, max length 30 characters. NOTE: the entries will be saved in NVM. NOTE: this command supports up to 30 entries. NOTE: entries added or updated with **#PLMNUPDATE** are effective only if **#PLMNMODE** is set to 2.

#PLMNUPDATE – Update PLMN List	
AT#PLMNUPDATE ?	Read command returns the list of entries added or updated with set command, in the format: **#PLMNUPDATE**: **<MCC>,<MNC>,<PLMNname>** **#PLMNUPDATE**: **<MCC>,<MNC>,<PLMNname>** **…** **OK** NOTE: the entries are in increasing order by MCC and MNC
AT#PLMNUPDATE =?	Test command returns the range of **<action>** parameter and the maximum length of **<MCC>**, **<MNC>** and **<PLMNname>** parameters.

5.6.1.10. PLMN List Selection - #PLMNMODE

#PLMNMODE – PLMN List Selection	
AT#PLMNMODE=[<mode>]	Set command selects the list of PLMN names to be used currently Parameter: **<mode>** 1 – disable PLMN list updates set with **#PLMNUPDATE** command (factory default) 2 – enable PLMN list updates set with **#PLMNUPDATE** command. Note: **<mode>** parameter is saved in NVM
AT#PLMNMODE?	Read command reports whether the currently used list of PLMN names is fixed or not, in the format: **#PLMNMODE: <mode>** (**<mode>** described above)
AT#PLMNMODE=?	Test command returns the supported range of values for parameter **<mode>**.

5.6.1.11. Display PIN Counter - #PCT

#PCT - Display PIN Counter	
AT#PCT	Execution command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, depending on **+CPIN** requested password in the format: **#PCT: <n>** where: **<n>** - 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.

#PCT - Display PIN Counter	
AT#PCT=?	Test command returns the OK result code.
Example	AT+CPIN? +CPIN: SIM PIN OK AT#PCT *Check PIN remained counter* #PCT: 3 OK AT+CPIN=1111 *Input incorrect PIN number* +CME ERROR: incorrect password AT#PCT #PCT: 2

5.6.1.12. Software Shut Down - #SHDN

#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: The maximum time to shutdown the device, completely is 25 seconds.
AT#SHDN=?	Test command returns the OK result code.

5.6.1.13. Fast Power Down - #FASTSHDN

#FASTSHDN – Configure fast Power down	
AT#FASTSHDN=[<mode>[,<pin>]]	Set command configure fast power down Parameter: **<mode>** - enables/disables fast power down. 0 – disables (factory default) 1 – enables on GPIO event **<pin>** - GPIO number used for fast power down event monitoring. Valid range is “any input pin”(see “Hardware User’s Guide”) This parameter used when **<mode>** is 1. Module enter power off autonomously if fast power down is enabled and event monitoring GPIO goes to low after modem boot done. Note: All configured value applied after reboot.

#FASTSHDN – Configure fast Power down	
	Note: All configured value stored in NVM and available on following reboot. Note: **It has highest priority than other functions when fast power down enabled and GPIO is used as fast power down event monitoring. Customer should not use GPIO for other function**.
AT#FASTSHDN	Execution command for perform immediately fast power down regardless to the GPIO status or enabled status.
AT#FASTSHDN?	Read command returns the saved value in the format: **#FASTSHDN: <mode>,<pin>**
AT#FASTSHDN=?	Test command returns the range for the parameters **<mode>** and **<pin>**

5.6.1.14. Extended Reset - #Z

#Z - Extended reset	
AT#Z=<profile>	Set command loads both base section and extended section of the specified user profile stored with AT&P. Parameter **<profile>** 0 – user profile 0 1 – user profile 1
AT#Z=?	Test command tests for command existence.

5.6.1.15. Periodic Reset - #ENHRST

#ENHRST – Periodic Reset	
AT#ENHRST=<mod>[,<delay>]	Set command enables/disables the unit reset after <**delay**> minutes. Parameters: <**mod**> 0 – disables the unit reset (factory default) 1 – enables the unit reset only for one time 2 – enables the periodic unit reset <**delay**> - time interval after that the unit reboots; numeric value in minutes Note: the settings are saved automatically in NVM only if old or new mod is 2. Any change from 0 to 1 or from 1 to 0 is not stored in NVM Note: the particular case AT#ENHRST=1,0 causes the immediate module reboot. In this case if AT#ENHRST=1,0 follows an AT command that stores some parameters in NVM, it is recommended to insert a delay of at least 5 seconds before to issue AT#ENHRST=1,0, to permit the complete NVM storing. Note: maximum <**delay**> value is 2184 mins
AT#ENHRST?	Read command reports the current parameter settings for #EHNRST command in the format:

#ENHRST – Periodic Reset	
	#**EHNRST**: < **mod** >[,<**delay**>,<**remainTime**>] <**remainTime**> - time remaining before next reset
AT#ENHRST=?	Test command reports supported range of values for parameters <**mod**> and <**delay**>.
Example	AT#ENHRST=1,60 …. Module reboots after 60 minutes … AT#ENHRST=1,0

5.6.1.16. Wake From Alarm Mode - #WAKE

AT#WAKE – Wake From Alarm Mode	
AT#WAKE =[<opmode>]	Execution command stops any eventually present alarm activity and, if the module is in **alarm mode**, it exits the **alarm mode** and enters the **normal operating mode**. Parameter: **<opmode>** - operating mode 0 - normal operating mode; the module exits the **alarm mode**, enters the **normal operating mode**, any alarm activity is stopped (e.g. alarm tone playing) and an **OK** result code is returned. Note: the **alarm mode** is indicated by status **ON** of hardware pin **CTS** and by status **ON** of pin **DSR**; the power saving status is indicated by a **CTS - OFF** and **DSR - OFF** status; the **normal operating status** is indicated by **DSR - ON**. Note: 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 SM, 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. Note: if #**WAKE=0** command is issued after an alarm has been set with **+CALA** command, but before the alarm has expired, it will answer **OK** but have no effect.
AT#WAKE?	Read command returns the **operating status** of the device in the format: **#WAKE: <status>** where: <**status**> 0- normal operating mode 1- alarm mode or normal operating mode with some alarm activity.

AT#WAKE – Wake From Alarm Mode	
AT#WAKE=?	Test command returns the OK result code.

5.6.1.17. Temperature Monitor - #TEMPMON

#TEMPMON - Temperature Monitor	
AT#TEMPMON= <mod> [,<urcmode> [,<action> [,<hyst_time> [,<GPIO>]]]]	Set command sets the behavior of the module internal temperature monitor. Parameters: **<mod>** 0 - sets the command parameters. 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. **(Default 0)** 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=4**) 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) 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 sav ed 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>**, **<urc mode>**, **<action>**, **<hyst_time>** and **<GPIO>**
Note	The following table is describing the temperature levels.

	Extreme Temperature Lower Bound(*) **-40°C** **Operating Temperature Lower Bound(*)** **-40°C** **Operating Temperature** **Operating Temperature Upper Bound(*)** **+85°C** **Extreme Temperature Upper Bound(*)** **+85°C** (*) Due to temperature measurement uncertainty there is a tolerance of +/-2°C The automatic power off is deferred in case of an Emergency Call

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

#GPIO - General Purpose Input/Output Pin Control	
AT#GPIO=[<pin>, <mode>[,<dir> [,<save]]]	Execution command sets the value of the general purpose output pin **GPIO<pin>** according to **<dir>** and **<mode>** parameter. Not all configuration for the three parameters are valid. 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 - no meaning if **<dir>=2, 3, 4, 5, 6** - ALTERNATE FUNCTION 1 - no meaning if **<dir>=0** - INPUT - output pin set to 1 (**High**) if **<dir>=1** - OUTPUT - no meaning if **<dir>=2, 3, 4, 5, 6** - ALTERNATE FUNCTION 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 - Reports a no meaning value if **<dir>=2** - ALTERNATE FUNCTION 3 - if **<dir>=0** – INPUT, enable Pull-Up 4 - if **<dir>=0** – INPUT, enable Pull-Down **<dir>** - GPIO pin direction 0 - pin direction is INPUT 1 - pin direction is OUTPUT 2,3,4,5,6,7 - pin direction is Alternate Function ALT1, ALT2, ALT3, ALT4, ALT5, ALT6 respectively (see Note). **<save>** - GPIO pin save configuration 0 – pin configuration is not saved 1 – pin configuration is saved Note: when <save> is omitted the configuration is stored only if user set or reset ALTx function on <dir> parameter. Note: if values of **<dir>** is set in output and save omitted then it is set automatically

#GPIO - General Purpose Input/Output Pin Control	
	in input on next power cycle. 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: "ALT1" value is valid only for following pins: **GPIO6**: alternate function is "DAC Output" "ALT2" value is valid for all GPIOs: alternate function is "Alarm pin" "ALT3" value is valid for all GPIOs as "TempMon Pin" "ALT4" value is valid for all GPIOs as "AD_Det Pin" "ALT5" value is valid for all GPIOs as "AD_Rep Pin" "ALT6" value is valid for all GPIOs as "Fast power down". This value is only possible to set by #FASTSHDN (see #FASTSHDN) Note: while using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and shall be avoid. Note: GPIO6 is also configured as DAC pin (ALT1 function) with the command **#DAC.** Note: Alarm Pin can be also configured through **#ALARMPIN** command. Note: AD_Det pin and AD_Rep pin can be also configured through **#GSMAD** command.
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 If <mode> = 3,4 the out format is **#GPIO: <dir>,<stat>,<mode>[<CR><LF>#GPIO: <dir>,<stat>,<mode>[…]]** Note: <dir> is 6 if GPIO is used as fast power down monitoring pin.

#GPIO - General Purpose Input/Output Pin Control	
AT#GPIO=?	Test command reports the supported range of values of the command parameters **<pin>**, **<mode>, <dir>**, **<save>**
Example	AT#GPIO=3,0,1 OK AT#GPIO=3,2 #GPIO: 1,0 OK AT#GPIO=4,1,1 OK AT#GPIO=5,0,0 OK AT#GPIO=6,2 #GPIO: 0,1 OK

5.6.1.19. Alarm Pin - #ALARMPIN

#ALARMPIN – Alarm Pin	
AT#ALARMPIN= <pin>	Set command sets the GPIO pin for the ALARM pin Parameters: **<pin>** defines which GPIO shall be used as ALARM pin. For the < **pin** > actual range check the “Hardware User Guide”. Default value is 0, which means no ALARM pin set. Note: the setting is saved in NVM Note: ALARM pin function of a GPIO corresponds to ALT2 function of the GPIO. So it can be also set through AT#GPIO command, ALT2 function.
AT#ALARMPIN?	Read command returns the current parameter settings for #ALARMPIN command in the format: #ALARMPIN: **<pin>**
AT#ALARMPIN=?	Test command reports the supported range of values for parameter <pin>.

5.6.1.20. 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)

#SLED - STAT_LED GPIO Setting	
	with the following timings: • not registered : always on • registered in idle: blinking 1s on and 2s off • registered in idle with powersaving : blinking time depends on network condition in order to minimize power consumption 3 - GPIO is turned on and off alternatively, with period defined by the sum **<on_duration>** + **<off_duration>** 4 - GPIO handled by Module Software with the following timings: • not registered : blinking 0,5s on and 0,5s off • registered in idle: blinking 300ms on and 2,7s off • registered in idle with powersaving: blinking time depends on network condition in order to minimize power consumption <**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:** when module boot the **STAT_LED** GPIO always tied **High** and holds this value until the first NVM reading.
AT#SLED?	Read command returns the **STAT_LED** GPIO current setting, in the 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>**.

5.6.1.21. 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.

5.6.1.22. LED Pin Control - #LEDEN

#LEDEN – LED Pin Control	
AT#LEDEN= <state>	Set command High/Low for the LED Pin Control. If High, LED will operate. Parameter: **<state>**

#LEDEN – LED Pin Control	
	0 – Low LED Pin (factory default) 1 – High LED Pin
AT#LEDEN?	Read command reports current setting value , in the format: **#LEDEN: <state>**
AT#LEDEN=?	Test command reports the range of supported values for parameter **<state>**

5.6.1.23. 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. Note: if +CNMI=**3,1** command is issued and the module is in a GPRS connection, a 1 sec. pulse is generated on **RI** pin, no matter if the **RI** pin response is either enabled or not.
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.
AT#E2SMSRI=?	Reports the range of supported values for parameter **<n>**
Example	AT#E2SMSRI=50 OK

5.6.1.24. Event Ring Indicator - #E2RI

AT#E2RI – Event Ring Indicator	
AT#E2RI=<event_mask>,<duration>	Set command enables/disables the Ring Indicator pin response to one or more events. If an event has been enabled, a negative going pulse is generated when event happens. The duration of this pulse is determined by the value of **<duration>**. Parameters: : **<event_mask>** 0 – disables all events hexadecimal number representing the list of events: 1 – Power Saving Mode (same as **AT#PSMRI=<duration>**) 2 – Socket Listen (same as **AT#E2SLRI=<duration>**)

AT#E2RI – Event Ring Indicator	
	4 – OTA firmware upgrade (same as **AT#OTASETRI=<duration>**) 8 – MT SMS has been received (same as **AT#E2SMSRI=<duration>**) 10 – +CREG will change status 20 – +CGREG will change status 40 – #QSS become 2 (SIM INSERTED and PIN UNLOCKED) 80 – MO SMS has been delivered 100 – Jamming Detection & Reporting (JDR) The hexadecimal number is actually a bit mask, where each bit, when set/not set, indicates that the corresponding event has been enabled/disabled. **<duration>** 0 - disables RI pin response. (factory default) 50..1150 - the duration in ms of the pulse generated Note: The values set by the command are stored in the profile extended section and they don't depend on the specific AT instance. Note: Enabling JDR event when the Enhanced Jamming Detection & Reporting is not supported <event_mask> value 100 is for backward compatibility Note: OTA firmware upgrade not supported <event_mask> value 4 is for backward compatibility
AT#E2RI?	Read command reports a line for each event and the duration in ms of the pulse generated, in the format: **#E2RI: <event_mask>,<duration>**
AT#E2RI=?	Test command returns supported values of parameters **<event_mask>** and **<duration>**

5.6.1.25. 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 for LE922A6 2 - available for LE922A6 3 - available for LE922A6 **<mode>** - required action 2 - query ADC value

#ADC - Read Analog/Digital Converter Input	
	<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><CR><LF>#ADC: <value>**
AT#ADC=?	Test command reports the supported range of values of the command parameters **<adc>**, **<mode>** and **<dir>**.

5.6.1.26. 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.

5.6.1.27. 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: 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 ouptput pin: we maintain this value only for backward compatibility, but trying to set its state raise the result code "**ERROR**" (not yet implemented) 5 – **RTS** (Ready To Send). This is not an ouptput pin: we maintain this value only for backward compatibility, but trying to set its state raise the result code "**ERROR**" **<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>**.

5.6.1.28. 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**" (not yet implemented)

#V24 - V24 Output Pins Control	
	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 the actual state of the pin.
AT#V24?	Read command returns actual state for all the pins in the format: **#V24: <pin1>,<state1>[<CR><LF>** **#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**>.

5.6.1.29. Auto-Attach Property - #AUTOATT

#AUTOATT – Auto-Attach Property	
AT#AUTOATT= [<auto>]	Set command enables/disables the TE auto-attach property for PS domain. Parameter: <**auto**> 0 - disables auto-attach property for PS domain 1 - enables auto-attach property for PS domain (factory default): after the command **#AUTOATT=1** has been issued (and at every following startup) the terminal will automatically try to attach to the packet domain service.
AT#AUTOATT?	Read command reports whether the auto-attach property is currently enabled or not, in the format: **#AUTOATT: <auto>**
AT#AUTOATT=?	Test command reports available values for parameter <**auto**>.

5.6.1.30. 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/LTE-related information. Parameter:

#MONI – Cell Monitor	
	<number> **<GSM>** 0…6 – it is the ordinal number of the cell, in a neighbour of the serving cell (default 0, serving cell). 7 – it is a special request to obtain GSM-related information from the whole set of seven cells in the whole set of seven cells in the neighbour of the serving cell. **<WCDMA>** 0 – it is the active set 1 – it is the candidate set 2 – it is the synchronized neighbour set 3 – it is the asynchronized neighbour set 4 – it is the ranked neighbour set(cells which are not suitable cells to camp on) 7 – it is a special request to obtain information from the whole set of detected cells in the neighbour list of the serving cell. 5…6 – it is not available **<LTE>** 0 – it is the serving cell 1 – it is the intra-frequency cells 2 – it is the inter-frequency cells 3 – it is the WCDMA neighbour cells 4 – it is the GSM neighbour cells 5…7 – it is not available Note: issuing AT#MONI<CR> indicates the following GSM/WCDMA/LTE-related information for selected cell and dedicated channel(if exists). 1. If the last setting done by #MONI is in the range [0..6], the output format is as follows: a) When extracting data for the serving cell and the network name is known the format is: **(GSM)** #MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm>dbm TA: <timadv> **(WCDMA)** #MONI: <netmame> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm>dbm DRX:<drx> SCR:<scr> **(LTE)** #MONI: <netmame> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm DRX:<drx> b) When the network name is unknown, the format is: **(GSM)**

#MONI – Cell Monitor	
	#MONI: Cc:<cc> Nc:<nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm>dbm TA: <timadv> **(WCDMA)** #MONI: Cc:<cc> Nc:<nc> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm>dbm DRX:<drx> SCR:<scr> **(LTE)** #MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm DRX:<drx> c) When extracting data for an adjacent cell, the format is: **(GSM)** #MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm>dbm **(WCDMA)** #MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr> **(LTE)** (E-UTRAN intra-frequency and inter-frequency cells) #MONI: RSRP:<rsrp> RSRQ:<rsrq> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm 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 <lac> - localization area code <tac> - Tracking Area Code <id> - cell identifier (hexadecimal character format) <arfcn> - assigned radio channel <uarfcn> - UMTS assigned radio channel <earfcn> - E-UTRAN 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 <drx> - Discontinuous reception cycle length <scr> - Scrambling code <rsrp> - Reference Signal Received Power <rsrq> - Reference Signal Received Quality Note: TA: <timadv> is reported only for the serving cell. 2. If the last setting done by #MONI is 7, the execution command produces a table-like formatted output, as follows:

#MONI – Cell Monitor	
	(GSM network) a) First row reports the identifying name of the 'columns' #MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN<CR><LF> b) Second row reports a complete set of GSM-related information for the serving cell: #MONI: S: <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value> <timadv> <qual> <netname><CR><LF> c) 3rd to 8th rows report a reduced set of GSM-related information for the cells in the neighbours: #MONI: N<n> <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value>[<CR><LF>] where: <C1value> - C1 reselection parameter <C2value> - C2 reselection parameter other parameters as before **(WCDMA network)** a) First row reports a set of information for the serving cell: #MONI: <netname> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id>EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> DRX:<drx> SCR:<scr> b) the other rows report a set of information for all detected neighbour cells: #MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr> See above for parameters description. When the last setting done is AT#MONI=7, then the Read command indicates the above information for each of the cells in the neighbour of the serving cell, formatting them in a sequence of <CR><LF>-terminated strings. Currently, it is available in case of GSM network.
AT#MONI=?	Test command indicates the maximum number of cells, in a neighbour of the serving cell excluding it, from which we can extract GSM/WCDMA/LTE-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.

5.6.1.31. Compressed Cell Monitor - #MONIZIP

#MONIZIP – Compressed Cell Monitor	
AT#MONIZIP[= [<number>]]	Set command sets one cell out of seven, in a neighbour of the serving cell including it, from which extract GSM/WCDMA/LTE-related information. Parameter: <number> **<GSM>** 0…6 – it is the ordinal number of the cell, in a neighbour of the serving cell (default 0, serving cell). 7 – it is a special request to obtain GSM-related information from the whole set of seven cells in the whole set of seven cells in the neighbour of the serving cell. **<WCDMA>** 0 – it is the active set 1 – it is the candidate set 2 – it is the synchronized neighbour set 3 – it is the asynchronized neighbour set 4 – it is the ranked neighbour set(cells which are not suitable cells to camp on) 7 – it is a special request to obtain information from the whole set of detected cells in the neighbour list of the serving cell. 5…6 – it is not available **<LTE>** 0 – it is the serving cell 1 – it is the intra-frequency cells 2 – it is the inter-frequency cells 3 – it is the WCDMA neighbour cells 4 – it is the GSM neighbour cells 5…7 – it is not available Note: issuing AT#MONIZIP<CR> indicates the following GSM/WCDMA/LTE-related information for selected cell and dedicated channel(if exists). a) When extracting data for the serving cell format is: **(GSM)** #MONIZIP: <cc><nc>,<bsic>,<qual>,<lac>,<id>,<arfcn>,<dBm>, <timadv> **(WCDMA)** #MONIZIP: <cc><nc>,<psc>,<rscp>,<lac>,<id>,<ecio>,<uarfcn>, <dBm>dbm,<drx>,<scr> **(LTE)** #MONIZIP: <netmame>,<rsrp>,<rsrq>,<tac>,<id>,<earfcn>,<dBm>,<drx> b) When extracting data for an adjacent cell(or active set cell), the format is: **(GSM)**

#MONIZIP – Compressed Cell Monitor	
	#MONIZIP: <lac>,<id>,<arfcn>,<dBm> **(WCDMA)** #MONIZIP: <psc>,<rscp>,<ecio>,<uarfcn>,<scr> **(LTE)** (E-UTRAN intra-frequency and inter-frequency cells) #MONIZIP: <rsrp>,<rsrq>,<id>,<earfcn>,<dBm> 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 <lac> - localization area code <tac> - Tracking Area Code <id> - cell identifier (hexadecimal character format) <arfcn> - assigned radio channel <uarfcn> - UMTS assigned radio channel <earfcn> - E-UTRAN 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 <drx> - Discontinuous reception cycle length <scr> - Scrambling code <rsrp> - Reference Signal Received Power <rsrq> - Reference Signal Received Quality Note: TA: <timadv> is reported only for the serving cell. When the last setting done is AT#MONI=7, the execution command produces a table-like format is as follows. Currently, it is available in case of GSM network and WCDMA network. **(GSM)** a. First row reports a complete set of GSM-related information for the serving cell: #MONIZIP: <bsic>,<lac>,<id>,<arfcn>,<dBm>,<C1value>,<C2value>, <timadv>,<qual>,<cc>,<nc>,<CR><LF> b. 2nd to 7th rows report a reduced set of GSM-related information for the cells in the neighbours: #MONIZIP: <bsic>,<lac>,<id>,<arfcn>,<dBm>,<C1value>,<C2value> [<CR><LF>] Where: <C1value> - C1 reselection parameter

#MONIZIP – Compressed Cell Monitor	
	<C2value> - C2 reselection parameter Other parameters as before **(WCDMA)** a. First row reports a set of information for the serving cell: #MONIZIP: <netname>,<psc>,<rscp>,<lac>,<id>,<ecio>,<uarfcn>, <dBm>,<drx>,<scr> b. the other rows report a set of information for all detected neighbour cells: #MONIZIP: <psc>,<rscp>,<ecio><uarfcn>,<src> See above for parameters description.
AT#MONIZIP=?	Test command indicates the maximum number of cells, in a neighbour of the serving cell excluding it, from which we can extract GSM/WCDMA/LTE-related information, along with the ordinal number of the current selected cell, in the format: #MONIZIP: (<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 #MONIZIP.

5.6.1.32. Modem Status - #MSTATUS

#MSTATUS – Modem Status	
AT#MSTATUS	Execution command indicates about the current operational status of the modem, in the format: #MSTATUS: Elapsed Time: **<cid1>,<etime1>,<cid2>,<etime2>,…** LTE band: **<lband>** MM: **<mmstate>,<mmsubstate>** GMM: **<gmmstate>,<gmmsubstate>** EMM: **<emmstate>,<emmsubstate>** OK where: **<cid>** - PDP context identifier PDP context identifiers which are configured by +CGDCONT **<etime>** - elapsed time for PDP context activation hh:mm:ss where: hh : hour mm : minute

#MSTATUS – Modem Status	
	ss : second 0 means that PDP context is not activated and not registered in the network. <**lband**> - LTE band <**mmstate**> - MM states 0: NULL 3: LOCATION UPDATE INITIATED 5: WAIT FOR OUTGOING MM CONNECTION 6: CONNECTION ACTIVE 7: IMSI DETACH INITIATED 8: PROCESS CM SERVICE PROMPT 9: WAIT FOR NETWORK COMMAND 10: LOCATION UPDATE REJECTED 13: WAIT FOR RR CONNECTION LU 14: WAIT FOR RR CONNECTION MM 15: WAIT FOR RR CONNECTION IMSI DETACH 17: REESTABLISHMENT INITIATED 18: WAIT FOR RR ACTIVE 19: IDLE 20: WAIT FOR ADDITIONAL OUTGOING MM CONNECTION 21: WAIT FOR RR CONNECTION REESTABLISHMENT 22: WAIT FOR REESTABLISH DECISION 23: LOCATION UPDATING PENDING 25: RR CONNECTION RELEASE NOT ALLOWED <**mmsubstate**> - MM sub-states 0: NULL SUBSTATE 1: NO IMSI 2: PLMN SEARCH 3: LIMITED SERVICE 4: ATTEMPTING TO UPDATE 5: LOCATION UPDATE NEEDED 6: NO CELL AVAILABLE 7: PLMN SEARCH NORMAL SERVICE 8: NORMAL SERVICE 9: ECALL INACTIVE <**gmmstate**> - GMM states 0: NULL 1: DEREGISTERED 2: REGISTERED INITIATED 3: REGISTERED 4: DEREGISTERED INITIATED 5: RA_UPDATING INITIATED 6: SERVICE REQUEST INITIATED <**gmmsubstate**> - GMM sub-states 0: NORMAL SERVICE 1: LIMITED SERVICE 2: ATTACH NEEDED 3: ATTEMPTING TO ATTACH

#MSTATUS – Modem Status	
	4: NO IMSI 5: NO CELL AVAILABLE 6: PLMN SEARCH 7: SUSPENDED 8: UPDATE NEEDED 9: ATTEMPTING TO UPDATE 10: ATTEMPTING TO UPDATE MM 11: IMSI DETACH INITIATED 12: NULL SUBSTATE **<emmstate>** - EMM states 0: NULL 1: DEREGISTERED 2: REGISTERED INITIATED 3: REGISTERED 4: TRACKING AREA UPDATING_INITIATED 5: SERVICE REQUEST INITIATED 6: DEREGISTERED INITIATED 7: INVALID STATE **<emmsubstate>** - EMM sub-states This parameter depend on the EMM Status is “DEREGISTERD”. 0: NO_IMSI 1: PLMN_SEARCH 2: ATTACH_NEEDED 3: NO_CELL_AVAILABLE 4: ATTEMPTING_TO_ATTACH 5: NORMAL_SERVICE 6: LIMITED_SERVICE 7: EMM_DEGEGISTERED_WAITING_PDN_CONN_REQ This parameter depend on the EMM Status is “REGISTERD”. 0: NORMAL_SERVICE 1: UPDATE_NEEDED 2: ATTEMPTING_TO_UPDATE 3: NO_CELL_AVAILABLE 4: PLMN_SEARCH 5: LIMITED_SERVICE 6: ATTEMPTING_TO_UPDATE_MM 7: IMSI_DETACH_INITIATED 8: WAITING_FOR_ESM_ISR_STATUS
AT#MSTATUS=?	Test command returns the OK result code.

5.6.1.33. HSDPA Channel Quality Indication - #CQI

#CQI –Channel Quality Indication	
AT#CQI	Execution command indicates channel quality indication in the form: #CQI: <cqi> Where <cqi> - cqi value

#CQI –Channel Quality Indication	
	0-30 31 – unknown or not detectable Note: Values are valid only if the module is registered on a WCDMA network with HSDPA/HSUPA established. There will be no CQI if HSDPA/HSUPA is not established. Note: This command is not supported in LTE-only variants.
AT#CQI=?	Test command returns the supported range of values of the parameters <cqi>.

5.6.1.34. Packet Service Network Type - #PSNT

#PSNT – Packet Service Network Type	
AT#PSNT=<mode>	Set command enables/disables unsolicited result code for packet service network type (PSNT). **Parameter:** **<mode>** 0 - disable PSNT unsolicited result code (factory default) 1 - enable PSNT unsolicited result code 2 - PSNT unsolicited result code enabled; read command reports HSUPA and HSDPA related info. **Note: <mode>** parameter setting is stored in NVM.
AT#PSNT?	Read command reports the <mode>,<nt> and HSUPA and HSDPA related info in the format: (<mode> = 2) #PSNT: <mode>,<nt>,<is_hsupa_available>, is_hsupa_used>,<is_hsdpa_available>,<is_hsdpa_used> (<mode> = 0 or <mode> = 1) #PSNT: <mode>,<nt> **Where:** **<mode>** 0 - PSNT unsolicited result code disabled 1 - PSNT unsolicited result code enabled 2 - PSNT unsolicited result code enabled; read command reports HSUPA and HSDPA related info **<nt>** - network type 0 - GPRS network 1 - EGPRS network 2 - WCDMA network 3 - HSDPA network 4 - LTE network 5 - unknown or not registered

#PSNT – Packet Service Network Type	
	6 - HSPA+ network 7 - DC-HSPA+ network **<is_hsupa_available>** - HSUPA available 0 – HSUPA is not supported by network 1 – HSUPA is supported by network **<is_hsupa_used>** - HSUPA used 0 – HSUPA is not in use 1 – HSUPA is in use **<is_hsdpa_available>** - HSDPA available 0 – HSDPA is not supported by network 1 – HSDPA is supported by network **<is_hsdpa_used>** - HSPA used 0 – HSDPA is not in use 1 – HSDPA is in use **Note:** when the type of network is HSPA, the indication is certainly valid during traffic, while it could be not valid in idle because it depends on network broadcast parameters. **Note:** 4G/3G only products like LE922A6-A1 does not support GSM access technology**.** They can support only <**nt**> 2,3,4,5,6,7 except <**nt**> 0,1. **Note:** 4G only products like LE922A6-E1 does not support GSM and UTRA access technology and this command supports only hsdpa and hsupa, so it could not be performed on 4G only products.
AT#PSNT=?	Test command returns the range of supported **<mode>**s.

5.6.1.35. Read Current Network Status - #RFSTS

#RFSTS – Read current network status	
AT#RFSTS	Execution command reads current network status, in the format: **(GSM network)** **#RFSTS:** **<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,<RR>,<NOM>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>**

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>]

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 (In traffic only)
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(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)
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

(LTE Network)
#RFSTS:

#RFSTS – Read current network status

<PLMN>,<EARFCN>,<RSRP>,<RSSI>,<RSRQ>,<TAC>,<RAC>,[<TXPWR>],<DRX>,<MM>,<RRC>,<CID>,<IMSI>,[<NetNameAsc>],<SD>,<ABND>

Parameter	E-UTRAN Example	description
PLMN	"262 25"	Country code and operator code(MCC, MNC)
EARFCN	6400	E-UTRAN Assigned Radio Channel
RSRP	-99	Reference Signal Received Power
RSSI	-76	Received Signal Strength Indication
RSRQ	-7	Reference Signal Received Quality
TAC	40A5	Tracking Area Code
RAC	255	Routing Area Code
TXPWR	0	Tx Power (In traffic only)
DRX	64	Discontinuous reception cycle Length(cycle length : display using ms)
MM	19	Mobility Management
RRC	0	Radio Resource Control
CID	0000007	Cell ID(Hexadecimal character format).
IMSI	“262011242110776”	International Mobile Station ID
NetNameAsc	" Telekom.de "	Operation Name, Quoted string type or “” if network name is unknown
SD	3	Service Domain (0: No Service, 1: CS only, 2: PS only, 3: CS+PS)
ABND	20	Active Band (1..63) 3GPP TS 36.101

Note: nSAT - Number of active set, Maximum is 6.
Note: If nSAT value is 1, it means that active set number 1. Module does not display after parameters of nSAT.
Note: TXPWR of GSM network means 1 tx burst
Note: MM - Mobility Management States (for debug purpose only)
0 - NULL
3 - LOCATION_UPDATE_INITIATED
5 - WAIT_FOR_OUTGOING_MM_CONNECTION
6 - CONNECTION_ACTIVE
7 - IMSI_DETACH_INITIATED
8 - PROCESS_CM_SERVICE_PROMPT
9 - WAIT_FOR_NETWORK_COMMAND
10 - LOCATION_UPDATE_REJECTED
13 - WAIT_FOR_RR_CONNECTION_LU
14 - WAIT_FOR_RR_CONNECTION_MM
15 - WAIT_FOR_RR_CONNECTION_IMSI_DETACH
17 - REESTABLISHMENT_INITIATED
18 - WAIT_FOR_RR_ACTIVE

#RFSTS – Read current network status	
	19 - IDLE 20 - WAIT_FOR_ADDITIONAL_OUTGOING_MM_CONNECTION 21 - WAIT_FOR_RR_CONNECTION_REESTABLISHMENT 22 - WAIT_FOR_REESTABLISH_DECISION 23 - LOCATION_UPDATING_PENDING 24 - IMSI DETACH PENDING 25 - CONNECTION_RELEASE_NOT_ALLOWED **Note:** RR- Radio Resource States (for debug purpose only) 0 - INACTIVE 1 - GOING_ACTIVE 2 - GOING_INACTIVE 3 - CELL_SELECTION 4 - PLMN_LIST_SEARCH 5 - IDLE 6 - CELL_RESELECTION 7 - CONNECTION_PENDING 8 - CELL_REESTABLISH 9 - DATA_TRANSFER 10 - NO_CHANNELS 11 - CONNECTION_RELEASE 12 - EARLY_CAMPED_WAIT_FOR_SI 13 - W2G_INTERRAT_HANDOVER_PROGRESS 14 - W2G_INTERRAT_RESELECTION_PROGRESS 15 - W2G_INTERRAT_CC_ORDER_PROGRESS 16 - G2W_INTERRAT_RESELECTION_PROGRESS 17 - WAIT_FOR_EARLY_PSCAN 18 - GRR 19 - G2W_INTERRAT_HANDOVER_PROGRESS 21 - W2G_SERVICE_REDIRECTION_IN_PROGRESS 22 - RESET 29 - FEMTO 30 - X2G_RESEL 31 - X2G_RESEL_ABORTED 32 - X2G_REDIR 33 - G2X_REDIR 34 - X2G_CGI 35 - X2G_CCO_FAILED 36 - X2G_CCO_ABORTED 37 - X2G_CCO_FAILED_ABORTED 40 - RR_CELL_SELECTED_ACQUIRE_SI 41 - RR_STATE_MAX <**RRC**> - Radio Resource Control state for 3G (for debug purpose only)

#RFSTS – Read current network status	
	0 - IDLE 2 - CELL FACH 3 - CELL DCH 4 - CELL PCH 5 - URA PCH **<RRC>** - Radio Resource Control state for 4G (for debug purpose only) 0 - IDLE 2 - CELL DCH
AT#RFSTS=?	Test command returns the OK result code.

5.6.1.36. Serving Cell Information - #SERVINFO

#SERVINFO – Serving Cell Information	
AT#SERVINFO	Execution command reports information related serving cell, in the format: **<GSM>** #SERVINFO: <B-ARFCN>,<dBM>,<NetNameAsc>,<NetCode>, ,<BSIC>,<LAC>,<TA>,<GPRS>[,[<PB-ARFCN>],[<NOM>], <RAC>,[PAT]] **<WCDMA>** #SERVINFO: <UARFCN>, <dBM>, <NetNameAsc>,<NetCode>, <PSC>,<LAC>,<DRX>,<SD>,<RSCP>, <NOM>,<RAC> **<LTE>** #SERVINFO:<EARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<PhysicalCellId>,<TAC>,<DRX>,<SD>,<RSRP> 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

#SERVINFO – Serving Cell Information	
	<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 <UARFCN> - UMTS ARFCN of the serving cell <PSC> - Primary Synchronisation 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 <TAC> - Tracking Area Code <RSRP> - Reference Signal Received Power
AT#SERVINFO=?	Test command returns the OK result code.

5.6.1.37. Dialling Mode - #DIALMODE

#DIALMODE – Dialing Mode	
AT#DIALMODE=[<mode>]	Set command sets dialing modality. Parameter: **<mode>** 0 – (voice call only) **OK** result code is received as soon as it starts remotely ringing (factory default) 1 – (voice call only) **OK** result code is received only after the called party answers. Any character typed aborts the call and **OK** result code is received. 2 – (voice call and data call) the following custom result codes are received, monitoring step by step the call status: **DIALING** (MO in progress) **RINGING** (remote ring) **CONNECTED** (remote call accepted) **RELEASED** (after ATH) **DISCONNECTED** (remote hang-up) Any character typed before the **CONNECTED** message aborts the call Note: The setting is saved in NVM and available on following reboot.

#DIALMODE – Dialing Mode	
AT#DIALMODE?	Read command returns current **ATD** dialling mode in the format: **#DIALMODE: <mode>**
AT#DIALMODE=?	Test command returns the supported range of values for parameter **<mode>**.

5.6.1.38. Automatic Call - #ACAL

#ACAL – Automatic Call	
AT#ACAL=[<mode>]	Set command enables/disables the automatic call function. Parameter: **<mode>** 0 - disables the automatic call function (factory default) 1 - enables the automatic call function. If enabled (and **&D2** has been issued), the transition **OFF/ON** of **DTR** causes an automatic call to the first number (position 0) stored in the internal phonebook. Note: type of call depends on the last issue of command **+FCLASS**.
AT#ACAL?	Read command reports whether the automatic call function is currently enabled or not, in the format: **#ACAL: <mode>** where **<mode>** 0 - automatic call function disabled 1 - automatic call function from internal phonebook enabled 2 - automatic call function from “SM” phonebook enabled (by AT#ACALEXT) 3 - automatic call function from “ME” phonebook enabled (by AT#ACALEXT) Note: as a consequence of the introduction of the command **#ACALEXT** (Extended Automatic Call) it is possible that the Read Command returns a value supported by **#ACALEXT** but **NOT** supported by **#ACAL**. **AT#ACAL?** **#ACAL : 2** **OK** Due to this possible situation it is strongly recommended not to use contemporaneously both commands.
AT#ACAL=?	Test command returns the supported range of values for parameter **<mode>**.
Note	See **&Z** to write and **&N** to read the number on module internal phonebook.

5.6.1.39. Extended Automatic Call - #ACALEXT

#ACALEXT – Extended Automatic Call	
AT#ACALEXT=[<mode>,<index>]	Set command enables/disables the extended automatic call function. Parameters: **<mode>** 0 - disables the automatic call function (factory default) 1 - enables the automatic call function from internal phonebook enabled. 2 - enables the automatic call function from "SM" phonebook enabled. 3 - enables the automatic call function from "ME" phonebook enabled. **<index>** - it indicates a position in the currently selected phonebook. If the extended automatic call function is enabled and **&D2** has been issued, the transition **OFF/ON** of **DTR** causes an automatic call to the number stored in position **<index>** in the selected phonebook. Note: type of call depends on the last issue of command **+FCLASS**.
AT#ACALEXT?	Read command reports either whether the automatic call function is currently enabled or not, and the last <index> setting in the format: **#ACALEXT: <mode>,<index>**
AT#ACALEXT=?	The range of available positions in a phonebook depends on the selected phonebook. This is the reason why the test command returns three ranges of values: the first for parameter **<mode>**, the second for parameter **<index>** when is chosen the internal phonebook, the third for parameter **<index>** when "SM" is the chosen phonebook
Note	Issuing **#ACALEXT** causes the **#ACAL <mode>** to be changed. Issuing **AT#ACAL=1** causes the **#ACALEXT <index>** to be set to default. It is recommended to NOT use contemporaneously either **#ACALEXT** and **#ACAL**
Note	See **&Z** to write and **&N** to read the number on module internal phonebook.

5.6.1.40. Extended Call Monitoring - #ECAM

#ECAM – Extended Call Monitoring	
AT#ECAM=[<onoff>]	This command enables/disables the call monitoring function in the ME. Parameter: **<onoff>** 0 – disables call monitoring function. (factory default) 1 – enables call monitoring function; the ME informs about call events, such as incoming call, connected, hang up etc. using the following unsolicited indication: **#ECAM: <ccid>,<ccstatus>,<calltype>,,,[<number>,<type>]** Where: **<ccid>** - call ID

#ECAM – Extended Call Monitoring	
	<ccstatus> - call status 0 - idle 1 - calling (MO) 2 - connecting (MO) 3 - active 4 - hold 5 - waiting (MT) 6 - alerting (MT) 7 - busy 8 - retrieved 9 - CNAP (Calling Name Presentation) information (MT) **<calltype>** - call type 1 - voice 2 - data **<number>** - called number (valid only for **<ccstatus>=1**) **<type>** - type of **<number>** 129 - national number 145 - international number Note: the unsolicited indication is sent along with usual codes (**OK**, **NO CARRIER**, **BUSY**...).
AT#ECAM?	Read command reports whether the extended call monitoring function is currently enabled or not, in the format: **#ECAM: <onoff>**
AT#ECAM=?	Test command returns the list of supported values for **<onoff>**.

5.6.1.41. SMS Overflow - #SMOV

#SMOV - SMS Overflow	
AT#SMOV= [<mode>]	Set command enables/disables the SMS overflow signalling function. Parameter: **<mode>** 0 - disables SMS overflow signalling function (factory default) 1 - enables SMS overflow signalling function; when the maximum storage capacity has reached, the following network initiated notification is send: **#SMOV: <memo>** where **<memo>** is a string indicating the SMS storage that has reached maximum capacity: "SM" – SIM Memory "ME" – NVM SMS storage
AT#SMOV?	Read command reports whether the SMS overflow signalling function is currently enabled or not, in the format:

#SMOV - SMS Overflow	
	#SMOV: <mode>
AT#SMOV=?	Test command returns the supported range of values of parameter **<mode>**.
Example	AT#SMOV? #SMOV: 0 OK

5.6.1.42. Mailbox Numbers - #MBN

#MBN - Mailbox Numbers	
AT#MBN	Execution command returns the mailbox numbers stored on SIM, if this service is provided by the SIM. The response format is: **[#MBN: <index>,<number>,<type>[,<text>][,mboxtype][<CR><LF>** **#MBN: <index>,<number>,<type>[,<text>][,mboxtype][…]]]** where: **<index>** - record number **<number>** - string type mailbox number in the format **<type>** **<type>** - type of mailbox number octet in integer format 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command +CSCS **<mboxtype>** - the message waiting group type of the mailbox, if available: "VOICE" - voice "FAX" - fax "EMAIL" - electronic mail "OTHER" - other Note: if all queried locations are empty (but available), no information text lines will be returned.
AT#MBN=?	Test command returns the **OK** result code.

5.6.1.43. 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 start-up, the presentation of the status of the **message waiting indicators**, as they are currently stored on

#MWI - Message Waiting Indication	
	SIM.**(Factory default)** 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 start-up 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>**. **<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 whether 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>**.

5.6.1.44. GSM and UMTS Audio Codec - #CODEC

#CODEC – Audio Codec	
AT#CODEC= **[<codec>]**	Set command sets the GSM and UMTS audio codec mode. Parameter: **<codec>** 0 - all the codec modes are enabled (factory default) 1..255 - sum of integers each representing a specific codec mode: 1 - **FR**, full rate mode enabled (Not applicable for LE922A6 A1) 2 - **EFR**, enhanced full rate mode enabled (Not applicable for LE922A6 A1) 4 - **HR**, half rate mode enabled (Not applicable for LE922A6 A1) 8 - **AMR-FR**, AMR full rate mode enabled (Not applicable for LE922A6 A1) 16 - **AMR-HR**, AMR half rate mode enabled (Not applicable for LE922A6 A1) 32 - **FAWB**, full rate AMR wideband mode enabled (Not applicable for LE922A6 A1) 64 - **UAMR2**, UMTS AMR version 2 mode enabled 128 - **UAWB**, UMTS AMR wideband mode enabled Note: the full rate mode is added by default to any setting in the SETUP message (as specified in ETSI 04.08), but the call drops if the network assigned codec mode has not been selected by the user. Note: AT#CODEC=4 and AT#CODEC= 16 are not recommended; better using AT#CODEC=5 and AT#CODEC=24 respectively Note: the setting 0 is equivalent to the setting 255. Note: The codec setting is saved in the profile parameters. Note: This command is not supported in LTE-only variants.
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>**

5.6.1.45. 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 PS attach or after WCDMA/LTE registration. **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)

#NITZ – Network Timezone	
	1..15 - as a sum of: 1 - enables automatic date/time updating 2 - enables Full Network Name applying (not supported by LE) 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) (factory default is 7) **<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/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>**.

5.6.1.46. Clock management - #CCLK

AT#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:

AT#CCLK – Clock Management	
	"yy/MM/dd,hh:mm:ss±zz,d" **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); The range for dd (day) depends both on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31) Trying to enter an out of range value will raise an error **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 **d** – number of hours added to the local TZ because of Daylight Saving Time (summertime) adjustment; range is 0-2.
AT#CCLK?	Read command returns the current setting of the real-time clock, in the format **<time>.** Note: if the time is set by the network but the DST information is missing, or the time is set by +CCLK command, then the <time> format is: **"yy/MM/dd,hh:mm:ss±zz"**
AT#CCLK=?	Test command returns the **OK** result code.
Example	AT#CCLK="15/04/14,22:30:00+00,1" OK AT#CCLK? +CCLK: “15/04/14,22:30:00+00,1” OK

5.6.1.47. Clock Mode - #CCLKMODE

AT#CCLKMODE – Clock Mode	
AT#CCLKMODE =<time>	Set command enables the local time or the UTC time in AT+CCLK and AT#CCLK commands and in #NITZ URC. Parameter: <**mode**>- time and date mode

AT#CCLKMODE – Clock Mode	
	0 - Local time + local time zone offset (default) 1 – UTC time + local time zone offset Note: the setting is saved automatically in NVM
AT#CCLKMODE?	Read command reports whether the local time or the UTC time is enabled, in the format: #CCLKMODE: <**mode**> (<**mode**> described above)
AT#CCLKMODE=?	Test command reports the supported range of values for parameter <**mode**>
Example	at#cclkmode? #CCLKMODE: 0 OK #NITZ: 15/03/05,15:20:33+04,0 at+cclk? +CCLK: "15/03/05,15:20:37+04" OK at#cclkmode=1 OK at+cclk? +CCLK: "15/03/05,14:20:45+04" OK at#cclkmode? #CCLKMODE: 1 OK #NITZ: 15/03/05,14:20:53+04,0 at+cclk? +CCLK: "15/03/05,14:20:55+04" OK at#cclkmode=0 OK at+cclk? +CCLK: "15/03/05,15:20:59+04" OK

5.6.1.48. Select Band - #BND

#BND - Select Band	
AT#BND= **<GSM band>** **[,<UMTS band>** **[,<LTE band>]]**	Set command selects the current GSM , UMTS and LTE bands. Parameter **<GSM band>**: 0 - GSM 900MHz + DCS 1800MHz (default value depending on product) 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 + GSM 900MHz + DCS 1800MHz + PCS 1900MHz **<UMTS band>**: 0 - 2100MHz (FDD I) (default value depending on product) 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) (default value depending on product) 7 - 1700MHz (FDD IV) 8 - 2100MHz (FDD I) + 850MHz (FDD V) 9 - 2100MHz (FDD I) + 900MHz (FDD VIII) + 850MHz (FDD V) 10 - 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) 11 - 2100MHz (FDD I) + 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) + 900MHz (FDD VIII) 12 - 2100MHz (FDD I) + 1800MHz (FDD III) + 850MHz (FDD V) + 900MHz (FDD VIII) 13 - 1800MHz (FDD III) 14 - 2100MHz (FDD I) + 1800MHz (FDD III) + 850MHz (FDD V) 15 - 1800MHz (FDD III) + 850MHz (FDD V) <**LTE band**> 1 B1 4 B3 40 B7 80000 B20 80044 B3+B7+B20 (default value depending on product) 8000000 B28 8000000000 B40 8008000045 B1+B3+B7+B28+B40 (default value depending on product) Note: This setting is maintained even after power off. <GSM band>, <UMTS band> parameter is decimal value.

#BND - Select Band	
	<LTE band> parameter is hex value. Note: not all products support all the values of parameter **<band>**: please refer to test command to find the supported range of values. Note: not all products support all the values of parameter **<UMTS band>**: please refer to test command to find the supported range of values. Note: not all products support all the values of parameter **<LTE band>**: please refer to test command to find the supported range of values. Note: for 4G only product use fixed unused value 0 for **<band>** and **< UMTS band>** parameters. Note: for 4G/3G only product use fixed unused value 0 for **<band>** parameter. Note: for 4G/2G only product use fixed unused value 0 for **< UMTS band>** parameter.
AT#BND?	Read command returns the current selected band in the format: **#BND: <GSM band>, < UMTS band>,<LTE band>**
AT#BND=?	Test command returns the supported range of values of parameters **<GSM band>**, **< UMTS band> and <LTE band>**.

5.6.1.49. 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 – 2 : dummy values (It has no effect and is included only for backward compatibility) Factory default value is 2. Note: The function of #BND command included #AUTOBND Command. If you are needed the #AUTOBND function, you can be done Using the command #BND.
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>**.

5.6.1.50. Skip Escape Sequence - #SKIPESC

#SKIPESC - Skip Escape Sequence	
AT#SKIPESC=[<mode>]	Set command enables/disables skipping the escape sequence +++ while transmitting during a data connection. Parameter: **<mode>** 0 - doesn't skip the escape sequence; its transmission is enabled (factory default). 1 - skips the escape sequence; its transmission is not enabled. Note: in case of an FTP connection, the escape sequence is not transmitted, regardless of the command setting. Note: This command effect only on UART. No effect on USB
AT#SKIPESC?	Read command reports whether escape sequence skipping is currently enabled or not, in the format: **#SKIPESC: <mode>**
AT#SKIPESC=?	Test command reports supported range of values for parameter **<mode>**.

5.6.1.51. Escape Sequence Guard Time - #E2ESC

#E2ESC - Escape Sequence Guard Time	
AT#E2ESC=[<gt>]	Set command sets a guard time in seconds for the escape sequence in GPRS to be considered a valid one (and return to on-line command mode). Parameter: **<gt>** 0 - no guard time (factory default) 1..10 - guard time in seconds Note: if the Escape Sequence Guard Time is set to a value different from zero, it overrides the one set with **S12**.
AT#E2ESC?	Read command returns current value of the escape sequence guard time, in the format: **#E2ESC: <gt>**
AT#E2ESC=?	Test command returns the **OK** result code.

5.6.1.52. PPP-GPRS Connection Authentication Type - #GAUTH

#GAUTH PPP-GPRS Connection Authentication Type	
AT#GAUTH=[<type>]	Set command sets the authentication type used in PDP Context Activation regardless of triggering by internal or external. **Parameter:** **<type>** 0 - no authentication

	1 - PAP authentication (factory default) 2 - CHAP authentication **Note:** if the settings on the server side (the host application) of the PPP are not compatible with the AT#GAUTH setting, then the PDP Context Activation will use no authentication.
AT#GAUTH?	Read command reports the current authentication type, in the format: **#GAUTH: <type>**
AT#GAUTH=?	Test command returns the range of supported values for parameter **<type>**.
Note	
Example	AT#GAUTH=1 OK AT#GAUTH? #GAUTH: 1 OK AT#GAUTH=? #GAUTH: (0-2) OK
Reference	

5.6.1.53. PPP-GPRS Parameters Configuration - #GPPPCFG

#GPPPCFG – PPP-GPRS Parameters Configuration	
AT#GPPPCFG= <hostIPaddress> [,<unused_A>] [,<unused_B>]]	Set command sets one parameter for a dial-up connection Parameters: **<hostIPadress>** - **Host IP address** that is assigned to the PPP server side(the host application); String type, it can be any valid IP address in the format: "XXX.XXX.XXX.XXX" Note: if **<hostIPaddress>="000.000.000.000"**(factory default), host address is not included in the IPCP Conf Req and the host address choice is left to the peer
AT#GPPPCFG?	Read command reports the current PPP-GPRS connection parameters in the format: **#GPPPCFG: <hostIPaddress>,<unused_A>,<unused_B>**
AT#GPPPCFG=?	Test command returns the range of supported values for parameters **#GPPPCFG: (25),(0)**

5.6.1.54. RTC Status - #RTCSTAT

#RTCSTAT - RTC Status

#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. Note: RTC Status flag is distinguished by NV value between Power-off and Reboot.
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>**

5.6.1.55. 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 - periodic activation of the antenna detection algorithm; detection is started every **<interval>** period, using **<detGPIO>** for detection; if the algorithm detects a change in the antenna status the module is notified by URC **#GSMAD** (see format below) 2 - instantaneous activation of the antenna detection algorithm; if the algorithm detects a change in the antenna status the module is notified by URC (see format below); this instantaneous activation doesn't affect a periodic activation eventually started before. This modality is obsolete and is maintained only for backward compatibility. We suggest to use the modality 3 URC 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).

	3 - instantaneous activation of the antenna detection algorithm as modality 2 but in this case the command doesn't return until the algorithm ended. The returned value is the antenna <presence> status just detected. Format: AT#GSMAD=3 #GSMAD: <presence> OK This instantaneous activation doesn't affect a periodic activation eventually started before, then the output format would be: AT#GSMAD=3 #GSMAD: <presence> OK #GSMAD: <presence> // URC resulting of previous #GSMAD=1 **<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. For the <detGPIO> actual range see Test Command **<repGPIO>** - defines which GPIO shall be used by the Antenna Detection algorithm to report antenna condition. It has meaning only if **<mod>** is 1. For the **<repGPIO>** actual range see Test Command. 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>**

5.6.1.56. 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.

5.6.1.57. 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). Note: the command reports the SIM status change after the <mode> has been set to 2. We suggest to set <mode>=2 and save the value in the user profile, then power off the module. The proper SIM status will be available at the next power on.
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

5.6.1.58. SIM Detection Mode - #SIMDET

#SIMDET - SIM Detection Mode	
AT#SIMDET= <mode>	Set command specifies the SIM Detection mode Parameter: **<mode>** - SIM Detection mode 0 - ignore SIMIN pin and simulate the status 'SIM Not Inserted' 1 - ignore SIMIN pin and simulate the status 'SIM Inserted' 2 - automatic SIM detection through SIMIN Pin (default) Note: with Sim-On-Chip products, **#SIMDET** allows to switch between internal and external SIM, as described below: 0 - switch to internal SIM 1 - switch to external SIM, ignore SIMIN pin. 2 - automatic external SIM detection through SIMIN Pin (default). NOTE: with **#SIMDET**=1, although SIMIN pin is ignored, SIM removal is detected

#SIMDET - SIM Detection Mode	
AT#SIMDET?	Read command returns the currently selected Sim Detection Mode in the format: **#SIMDET: <mode>,<simin>** where: **<mode>** - SIM Detection mode, as before **<simin>** - SIMIN pin real status 0 - SIM not inserted 1 - SIM inserted
AT#SIMDET=?	Test command reports the supported range of values for parameter **<mode>**

5.6.1.59. SIM Presence Status - #SIMPR

#SIMPR – SIM Presence status	
AT#SIMPR= **[<mode>]**	Set command enables/disables the SIM Presence Status unsolicited indication in the ME. This command reports also the status of the remote SIM, if the SAP functionality is supported and has been enabled. Parameter: **<mode>** - type of notification 0 - disabled (factory default) 1 - enabled; the ME informs at every (local and remote) SIM status change through the following unsolicited indication: **#SIMPR: <SIM>,<status>** where: **<SIM>** - local or remote SIM 0 - local SIM 1 - remote SIM **<status>** - current SIM status 0 - SIM NOT INSERTED 1 - SIM INSERTED
AT#SIMPR?	Read command reports whether the unsolicited indication #SIMPR is currently enabled or not, along with the local and remote SIM status, in the format: **#SIMPR: <mode>,0,<status><CR><LF>** **#SIMPR: <mode>,1,<status>** If SAP functionality is not supported or enabled the remote SIM status will always be 0.
AT#SIMPR=?	Test command reports the range for the parameter **<mode>**

5.6.1.60. GPIO SIMIN Configuration - #SIMINCFG

#SIMINCFG – SIMIN pin configuration	
AT#SIMINCFG=	Set command sets GPIO SIMIN inserted level.

#SIMINCFG – SIMIN pin configuration	
[<gpio_pin >] **,<presence_status>**	Parameters: **<gpio_pin>** - GPIO SIMIN pin value **<presence_status>** - Status of the SIMIN pin to detect the presence of the SIM 0 - SIMIN to GND when the SIM is inserted (default) 1 - SIMIN to GND when the SIM is NOT insterted
AT#SIMINCFG?	Read command returns the current setting values. **#SIMINCFG: <presence_status>**
AT#SIMINCFG=?	Test command reports **<gpio_pin>** value and the supported range of parameters **<presence_status>.**
Example	The SIM is inserted in card slot. The SIMIN is GND when SIM is inserted. AT#SIMINCFG? #SIMINCFG: 0 OK AT#SIMPR? #SIMPR: 0, 0, 1 #SIMPR: 0, 1, 0 OK Remove SIM card AT#SIMPR? #SIMPR: 0, 0, 0 #SIMPR: 0, 1, 0 OK The SIM is inserted in card slot. The SIMIN is GND when SIM is not inserted. AT#SIMINCFG=,1 OK AT#REBOOT OK AT#SIMINCFG? #SIMINCFG: 1 OK AT#SIMPR? #SIMPR: 0, 0, 1 #SIMPR: 0, 1, 0 OK

#SIMINCFG – SIMIN pin configuration	
	Remove SIM card AT#SIMPR? #SIMPR: 0, 0, 0 #SIMPR: 0, 1, 0 OK

5.6.1.61. Network Scan Timer - #NWSCANTMR

#NWSCANTMR - Network Scan Timer	
AT#NWSCANTMR= [<tmr>]	Set command sets the Network Scan Timer that is used by the module to schedule the next network search when it is without network coverage (no signal). Parameter: **<tmr>** - timer value in units of seconds 5 ~ 30 - time in seconds (default 5 secs.)
AT#NWSCANTMR	Execution command reports time, in seconds, when the next scan activity will be executed. The format is: **#NWSCANTMREXP: <time>** Note: if **<time>** is zero it means that the timer is not running
AT#NWSCANTMR?	Read command reports the current parameter setting for **#NWSCANTMR** command in the format: **#NWSCANTMR: <tmr>**
AT#NWSCANTMR=?	Test command reports the supported range of values for parameter **<tmr>.**
Note	How much time it takes to execute the network scan depends either on how much bands have been selected and on network configuration (mean value is 5 seconds).

5.6.1.62. Command Mode Flow Control - #CFLO

AT#CFLO – Command Flow Control	
AT#CFLO= <enable>	Set command enables/disables the flow control in command mode. If enabled, current flow control is applied to both data mode and command mode. Parameter: <**enable**> - 0 – disable flow control in command mode <default value> 1 – enable flow control in command mode Note: Setting value is saved in the profile Note: This behavior is valid only for Main UART port. In case of USB port, flow control always enabled indpendent of this setting.

AT#CFLO – Command Flow Control	
AT#CFLO?	Read command returns current setting value in the format **#CFLO: <enable>**
AT#CFLO=?	Test command returns the range of supported values for parameter <**enable**>

5.6.1.63. I2C data via GPIO - #I2CWR

#I2CWR – Write to I2C	
AT#I2CWR= <sdaPin>, <sclPin>, <deviceId>, <registerId>, <len>	This command is used to Send Data to an I2C peripheral connected to module GPIOs **<sdaPin>**: GPIO number for SDA . Valid range is “any input/output pin” (see “Hardware User’s Guide”.) **<sclPin>**: GPIO number to be used for SCL. Valid range is “any output pin” (see “Hardware User’s Guide”). **<deviceId>**: address of the I2C device, without the LSB used for read\write command, 10 bit addressing supported. Value has to be written in hexadecimal form (without 0x). **<registerId>**: Register to write data to , range 0..255. Value has to be written in hexadecimal form (without 0x). **<len>**: number of data to send. Valid range is 1-254. The module responds to the command with the prompt '>' and awaits 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). Data shall be written in Hexadecimal Form. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Example if CheckAck is set and no Ack signal was received on the I2C bus **E.g.** AT#I2CWR=2,3,30,10,14 > 00112233445566778899AABBCCDD<ctrl-z> OK Set GPIO2 as SDA, GPIO3 as SCL; Device I2C address is 0x20; 0x10 is the address of the first register where to write I2C data; 14 data bytes will be written since register 0x10

#I2CWR – Write to I2C	
	NOTE: At the end of the execution GPIO will be restored to the original setting (check AT#GPIO Command) NOTE: device address, register address where to read from\ write to, and date bytes have to be written in hexadecimal form without 0x. NOTE: Command will not work if **<sdaPin>** or **<sclPin>** is used as #FASTSHDN. (see #FASTSHDN)
AT#I2CWR=?	Test command returns the range of each parameter**.**

5.6.1.64. I2C data from GPIO - #I2CRD

#I2CRD – Read from I2C	
AT#I2CRD= <sdaPin>, <sclPin>, <deviceId>, <registerId>, <len>	This command is used to Read Data from an I2C peripheral connected to module GPIOs **<sdaPin>**: GPIO number for SDA . Valid range is "any input/output pin" (see "Hardware User's Guide".) **<sclPin>**: GPIO number to be used for SCL. Valid range is "any output pin" (see "Hardware User's Guide"). **<deviceId>**: address of the I2C device, without the LSB used for read\write command, 10 bit addressing supported. Value has to be written in hexadecimal form (without 0x). **<registerId>**: Register to read data from , range 0..255. Value has to be written in hexadecimal form (without 0x). **<len>**: number of data to receive. Valid range is 1-254. Data Read from I2C will be dumped in Hex: **E.g.** AT#I2CRD=2,3,30,10,14 #I2CRD: 00112233445566778899AABBCCDD OK NOTE: If data requested are more than data available in the device, dummy data (normally 0x00 or 0xff) will be dumped. NOTE: At the end of the execution GPIO will be restored to the original setting (check AT#GPIO Command) NOTE: device address, register address where to read from\ write to, and date bytes have to be written in hexadecimal form without 0x.

#I2CRD – Read from I2C	
	NOTE: Command will not work if **<sdaPin>** or **<sclPin>** is used as #FASTSHDN. (see #FASTSHDN)
AT#I2CRD=?	Test command returns the range of each parameter**.**

5.6.1.65. Show 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: <cid>,<PDP_addr>[<CR><LF>#CGPADDR: <cid>, <PDP_addr>[…]]** **Parameters:** **<cid>** - a numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). If no **<cid>** specified, the addresses for all defined contexts are returned. 1 - 5 **<PDP_addr>** - a string that identifies the terminal in an 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#CGPADDR = #CGPADDR: 1,"10.76.2.254" #CGPADDR: 2,"" #CGPADDR: 3,""

#CGPADDR - Show PDP Address	
	OK
Reference	3GPP TS 27.007

5.6.1.66. 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: **<ChargerState>** - battery charger state 0 - charger not connected 1 - charger connected and charging 2 - charger connected and charge completed **<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. NOTE: '1' and '2' at <ChargerState> is not supported.
AT#CBC=?	Test command returns the **OK** result code.

5.6.1.67. Report concatenated SMS indexes - #CMGLCONCINDEX

#CMGLCONCINDEX – Report concatenated SMS indexes	
AT#CMGLCONCINDEX	The command will report a line for each concatenated SMS containing: **#CMGLCONCINDEX: N,i,j,k,...** where **N** is the number of segments that form the whole concatenated SMS **i,j,k** are the SMS indexes of each SMS segment , 0 if segment has not been received If no concatenated SMS is present on the SIM, only **OK** result code will be returned.
AT#CMGLCONCINDEX=?	Test command returns **OK** result code.
Example	AT#CMGLCONCINDEX #CMGLCONCINDEX: 3,0,2,3 #CMGLCONCINDEX: 5,4,5,6,0,8 OK

5.6.1.68. Reboot - #REBOOT

#REBOOT - Reboot	
AT#REBOOT	Execution command reboots the module.
AT#REBOOT=?	Test command returns the OK result code.
Example	AT#REBOOT=? OK AT#REBOOT OK

5.6.1.69. Hardware Identification - #HWREV

#HWREV – Hardware revision	
AT#HWREV	Execution command returns the device Hardware revision identification code without command echo.
AT#HWREV=?	Test command returns the **OK** result code.

5.6.1.70. Connected line identification restriction - #COLR

#COLR – Connected line identification restriction	
AT#COLR=[<n>]	Set command interrogate, activate or deactivate of the COLR service on the network. Parameter: **<n>** 0 – interrogate 1 – activate 2 – deactivate
AT#COLR?	Read command returns the presentation status of the COLR service on the network. **#COLR: <n>** **<n>** 0 – COLR not provisioned 1 – COLR provisioned 2 – unknown (e.g. no network, etc.)
AT#COLR=?	Test command returns supported parameters **<n>**

5.6.1.71. Enhanced call tone disable - #ECTD

#ECTD – Enhanced call tone disable	
AT#ECTD=[<type>]	Set command sets to disable related with call tone according to **<type>** parameter: Parameter: **<type>**

#ECTD – Enhanced call tone disable	
	0 – Not disable call tones (factory default) 1 – Call end tone
AT#ECTD?	Read command returns the current type of disabled call tone: **#ECTD: <type>**
AT#ECTD=?	Test command reports the range for the parameter **<type>**.

5.6.1.72. Call Forwarding Flags - #CFF

#CFF – Call Forwarding Flags	
AT#CFF=<enable>	Set command enables/disables the presentation of the call forwarding flags URC. **Parameter:** **<enable>** 0 – Disable the presentation of the #CFF URC (default value) 1 – Enable the presentation of the #CFF URC each time the call forward configuration is changed. This parameter is saved in the profile configuration. Unconditional (CFU) SS setting is changed or checked and, at startup, the presentation of the status of the call forwarding flags, as they are currently stored on SIM. The URC format is: **#CFF: <status>,<fwdtonum>** where: **<status>** 0 – CFU disabled 1 – CFU enabled **< fwdtonum >** - number incoming calls are forwarded to
AT#CFF?	Read command reports whether the presentation of the call forwarding flags URC is currently enabled or not, and, if the flags field is present in the SIM, the current status of the call forwarding flags as they are currently stored on SIM, and the number incoming calls are forwarded to. The format is: **#CFF: <enable>[,<status>,<fwdtonum>]**
AT#CFF=?	Test command returns the range of available values for parameter **<enable>**.

5.6.1.73. Codec Information - #CODECINFO

#CODECINFO – Codec Information	
AT#CODECINFO[=<format>[,<mode>]]	This command is both a set and an execution command. Set command enables/disables codec information reports depending on the parameter **<mode>**, in the specified **<format>**.

#CODECINFO – Codec Information	
	Parameters: **<format>** 0 - numeric format (default) 1 - textual format **<mode>** 0 - disable codec information unsolicited report (default) 1 - enable codec information unsolicited report only if the codec changes 2 - enable short codec information unsolicited report only if the codec changes If **<mode>=1** the unsolicited channel mode information is reported in the following format: (if **<format>=0**) **#CODECINFO: <codec_used>,<codec_set>** (if **<format>=1**) **#CODECINFO: <codec_used>,<codec_set1>** **[,<codec_set2>[..[,codec_setn]]]** If **<mode>=2** the unsolicited codec information is reported in the following format: **#CODECINFO: <codec_used>** The reported values are described below. Execution command reports codec information in the specified **<format>**. (if **<format>=0**) **#CODECINFO: <codec_used>**,**<codec_set>** (if **<format>=1**) **#CODECINFO: <codec_used>**,**<codec_set1>** **[,<codec_set2>[..[,codec_setn]]]** The reported values are: (if **<format>=0**) **<codec_used>** - one of the following channel modes: 0 – no TCH 1 - full rate speech 1 on TCH 2 - full rate speech 2 on TCH 4 - half rate speech 1 on TCH 8 - full rate speech 3 – AMR on TCH 16 - half rate speech 3 – AMR on TCH

#CODECINFO – Codec Information	
	128 - full data 9.6 129 - full data 4.8 130 - full data 2.4 131 - half data 4.8 132 - half data 2.4 133 - full data 14.4 134 - full rate AMR wide band 135 - UMTS AMR version 2 136 - UMTS AMR wide band **<codec_set>** 1..255 - 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 - FAMR, AMR full rate mode enabled 16 - HAMR, AMR half rate mode enabled 32 - FR-AMR-WB, full rate AMR wide band 64 - UMTS-AMR-V2, UMTS AMR version 2 128 - UMTS-AMR-WB, UMTS AMR wide band (if **<format>=1**) **<codec_used>** - one of the following channel modes: None - no TCH FR - full rate speech 1 on TCH EFR - full rate speech 2 on TCH HR - half rate speech 1 on TCH FAMR - full rate speech 3 – AMR on TCH HAMR - half rate speech 3 – AMR on TCH FD96 - full data 9.6 FD48 - full data 4.8 FD24 - full data 2.4 HD48 - half data 4.8 HD24 - half data 2.4 FD144 - full data 14.4 FAWB - full rate AMR wide band UAMR2 - UMTS AMR version 2 UAWB - UMTS AMR wide band **<codec_set*n*>** FR - full rate mode enabled EFR - enhanced full rate mode enabled HR - half rate mode enabled FAMR - AMR full rate mode enabled HAMR - AMR half rate mode enabled FAWB, full rate AMR wide band UAMR2 - UMTS AMR version 2

#CODECINFO – Codec Information	
	UAWB - UMTS AMR wide band Note: The command refers to codec information in speech call and to channel mode in data call. Note: if AT#CODEC is 0, the reported codec set for **<format>=0** is 255 (all codec). Note: LE922A6 A1 model does not support GSM mode. Note: This command is not supported in LTE-only variants.
AT#CODECINFO?	Read command reports **<format>** and **<mode>** parameter values in the format: **#CODECINFO: <format>,<mode>**
AT#CODECINFO=?	Test command returns the range of supported **<format>** and **<mode>**.

5.6.1.74. Subscriber number - #SNUM

#SNUM – Subscriber Number	
AT#SNUM=<index>,<number>[,<alpha>]	Set command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file. Parameter: **<index>** - record number The number of record in the EFmsisdn depends on the SIM. If only **<index>** value is given, then delete the EFmsisdn record in location **<index>** is deleted. **<number>** - string containing the phone number **<alpha>** - alphanumeric string associated to **<number>.** Default value is empty string (“”), otherwise, the used character set should be the one selected with **+CSCS.** The string could be written between quotes, the number of characters depends on the SIM. If empty string is given (""), the corresponding **<alpha>** will be an empty string. Note: the command return ERROR if EFmsisdn file is not present in the SIM or if MSISDN service is not allocated and activated in the SIM Service Table (see 3GPP TS 11.11).
AT#SNUM=?	Test command returns the **OK** result code

5.6.1.75. Extended Numeric Error report - #CEER

#CEER – Extended Numeric Error Report	
AT#CEER	Execution command causes the TA to return a numeric code in the format **#CEER: <code>** which should offer the user of the TA a report of the reason for

#CEER – Extended Numeric Error Report

- the failure in the last unsuccessful call setup (originating or answering);
- the last call release;
- the last unsuccessfull PS attach or unsuccessful PDP context activation;
- the last PS detach or PDP context deactivation.

Note: if none of the previous conditions has occurred since power up then 31 is reported (i.e. **Normal unspecified**, see below)
Note: Cause values classification
0 – 127 : Cause values to follow the 3GPP 24.008 Annex H.
224 – 260 : GPRS related error values.
240 – 255 : Telit internal values.
161 – 179 : LE922A6 specific values.

<code> values as follows

Value	Diagnostic
0	No error
1	Unassigned (unallocated) number
3	No route to destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized
58	Bearer capability not presently available

#CEER – Extended Numeric Error Report

63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than ACMmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with protocol state
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Interworking, unspecified
GPRS related errors	
224	MS requested detach
225	NWK requested detach
226	Unsuccessful attach cause NO SERVICE
227	Unsuccessful attach cause NO ACCESS
228	Unsuccessful attach cause GPRS SERVICE REFUSED
229	PDP deactivation requested by NWK
230	PDP deactivation cause LLC link activation Failed
231	PDP deactivation cause NWK reactivation with same TI
232	PDP deactivation cause GMM abort
233	PDP deactivation cause LLC or SNDCP failure
234	PDP unsuccessful activation cause GMM error
235	PDP unsuccessful activation cause NWK reject
236	PDP unsuccessful activation cause NO NSAPI available
237	PDP unsuccessful activation cause SM refuse
238	PDP unsuccessful activation cause MMI ignore
239	PDP unsuccessful activation cause Nb Max Session Reach
256	PDP unsuccessful activation cause wrong APN
257	PDP unsuccessful activation cause unknown PDP address or type
258	PDP unsuccessful activation cause service not supported
259	PDP unsuccessful activation cause QOS not accepted
260	PDP unsuccessful activation cause socket error
Other custom values	
240	FDN is active and number is not in FDN

#CEER – Extended Numeric Error Report			
		241	Call operation not allowed
		252	Call barring on outgoing calls
		253	Call barring on incoming calls
		254	Call impossible
		255	Lower layer failure
		LE922A6 internal values	
		161	RR release indication
		162	RR random access failure
		163	RRC release indication
		164	RRC close session indication
		165	RRC open session failure
		166	Low level failure
		167	Low level failure no redial allowed
		168	Invalid SIM
		169	No service
		170	Timer T3230 expired
		171	No cell available
		172	Wrong state
		173	Access class blocked
		174	Abort message received
		175	Other cause
		176	Timer T303 expired
		177	No resources
		178	Release pending
		179	Invalid user data
AT#CEER=?	Test command returns **OK** result code.		
Reference	3GPP TS 24.008		

5.6.1.76. Extended error report for Network Reject cause - #CEERNET

#CEERNET – Extended error report for Network reject cause			
AT#CEERNET	Execution command causes the TA to return a numeric code in the format **#CEERNET: <code>** which should offer the user of the TA a report for the last mobility management(GMM/MM) or session management(SM) procedure not accepted by the network and a report of detach or deactivation causes from network. **<code>** values as follows		
		Value	**Diagnostic**
		2	IMSI UNKNOWN IN HLR
		3	ILLEGAL MS
		4	IMSI UNKNOWN IN VISITOR LR
		5	IMEI NOT ACCEPTED

#CEERNET – Extended error report for Network reject cause

6	ILLEGAL ME
7	GPRS NOT ALLOWED
8	OPERATOR DETERMINED BARRING(SM cause failure)/ GPRS AND NON GPRS NOT ALLOWED(GMM cause failure)
9	MS IDENTITY CANNOT BE DERIVED BY NETWORK
10	IMPLICITLY DETACHED
11	PLMN NOT ALLOWED
12	LA NOT ALLOWED
13	ROAMING NOT ALLOWED
14	GPRS NOT ALLOWED IN THIS PLMN
15	NO SUITABLE CELLS IN LA
16	MSC TEMP NOT REACHABLE
17	NETWORK FAILURE
20	MAC FAILURE
21	SYNCH FAILURE
22	CONGESTION
23	GSM AUTHENTICATION UNACCEPTABLE
24	MBMS BEARER CAPABILITIES INSUFFICIENT FOR THE SERVICE
25	LLC OR SNDCP FAILURE
26	INSUFFICIENT RESOURCES
27	MISSING OR UNKNOWN APN
28	UNKNOWN PDP ADDRESS OR PDP TYPE
29	USER AUTHENTICATION FAILED
30	ACTIVATION REJECTED BY GGSN
31	ACTIVATION REJECTED UNSPECIFIED
32	SERVICE OPTION NOT SUPPORTED
33	REQ. SERVICE OPTION NOT SUBSCRIBED
34	SERV.OPTION TEMPORARILY OUT OF ORDER
35	NSAPI ALREADY USED
36	REGULAR DEACTIVATION
37	QOS NOT ACCEPTED
38	CALL CANNOT BE IDENTIFIED(MM cause failure) / ~~SMN~~ NETWORK FAILURE(SM cause failure)
39	REACTIVATION REQUIRED
40	NO PDP CTXT ACTIVATED(GMM cause failure)/ FEATURE NOT SUPPORTED(SM cause

#CEERNET – Extended error report for Network reject cause			
			failure)
		41	SEMANTIC ERROR IN TFT OPERATION
		42	SYNTACTICAL ERROR IN TFT OPERATION
		43	UNKNOWN PDP CNTXT
		44	SEM ERR IN PKT FILTER
		45	SYNT ERR IN PKT FILTER
		46	PDP CNTXT WITHOUT TFT ACTIVATED
		47	MULTICAST GROUP MEMBERSHIP TIMEOUT
		48	RETRY ON NEW CELL BEGIN(if MM cause failure) / ACTIVATION REJECTED BCM VIOLATION(if SM cause failure)
		50	PDP TYPE IPV4 ONLY ALLOWED
		51	PDP TYPE IPV6 ONLY ALLOWED
		52	SINGLE ADDRESS BEARERS ONLY ALLOWED
		63	RETRY ON NEW CELL END
		81	INVALID TRANSACTION IDENTIFIER
		95	SEMANTICALLY INCORRECT MESSAGE
		96	INVALID MANDATORY INFORMATION
		97	MSG TYPE NON EXISTENT OR NOT IMPLEMENTED
		98	MSG TYPE NOT COMPATIBLE WITH PROTOCOL STATE
		99	IE NON_EXISTENT OR NOT IMPLEMENTED
		100	CONDITIONAL IE ERROR
		101	MSG NOT COMPATIBLE WITH PROTOCOL STATE
		111	PROTOCOL ERROR UNSPECIFIED
		112	APN RESTRICTION VALUE INCOMPATIBLE WITH ACTIVE PDP CONTEXT
AT#CEERNET=?	Test command returns **OK** result code.		
Reference	3GPP TS 24.008		

5.6.1.77. Select language - #LANG

#LANG – select language	
AT#LANG=<lan>	Set command selects the currently used language for displaying different messages Parameter: **<lan>** - selected language

#LANG – select language	
	"en" - English (factory default) "it" - Italian "de" - German
AT#LANG?	Read command reports the currently selected <lan> in the format: **#LANG: <lan>**
AT#LANG=?	Test command reports the supported range of values for parameters **<lan>**

5.6.1.78. Periodical FPLMN clearing - #FPLMN

#FPLMN – Periodically FPLMN clearing	
AT#FPLMN= <action>[,<period>]	Periodically delete the Forbidden PLMN list stored inside the SIM card. Parameters: **<action>** : 0 – disable periodic FPLMN clearing (default) 1 – enable periodic FPLMN clearing with period <**period**> 2 – clear FPLMN file on SIM (one shot) 3 – read FPLMN file current content **<period>** : interval in minutes from FPLMN clearing, range 1...60, default value is 60 Note: the disable/enable value set by command is directly stored in NVM.
AT#FPLMN?	Read command returns current disable/enable action values in the format: #FPLMN: **<action>,<period>**
AT#FPLMN=?	Test command returns the list of supported values for each parameter: #FPLMN: (0-3),(1-60)
Example	AT#FPLMN? #FPLMN: 0,60 OK AT#FPLMN=3 #FPLMN: 1,"22803" #FPLMN: 2,"29502" #FPLMN: 3,"29505" #FPLMN: 4,"22802" OK AT#FPLMN=2 OK

	AT#FPLMN=3
	OK
	
	// restore previous FPLMN content
	AT+CRSM=214,28539,0,0,12,22F83092F52092F55022F820
	+CRSM: 144,0
	OK
	
	AT#FPLMN=3
	#FPLMN: 1,”22803”
	#FPLMN: 2,”29502”
	#FPLMN: 3,”29505”
	#FPLMN: 4,”22802”
	
	OK
	
	AT#FPLMN=1,8
	OK
	
	// after less than 8 minutes
	AT#FPLMN=3
	#FPLMN: 1,”22803”
	#FPLMN: 2,”29502”
	#FPLMN: 3,”29505”
	#FPLMN: 4,”22802”
	
	OK
	
	// after more than 8 minutes
	AT#FPLMN=3
	OK
	
	AT#FPLMN?
	#FPLMN: 1,8
	OK
	
	AT#FPLMN=0
	OK

5.6.1.79. Show Call Timers - #SCT

#SCT – Show Call Timers	
AT#SCT	Execution command returns the value stored in USIM field Incoming Call Timer, which contains the accumulated incoming call timer duration value for the current

#SCT – Show Call Timers	
	call and previous calls, and the value stored in the USIM field Outgoing Call Timer, that contains the accumulated outgoing call timer duration value for the current call and previous calls, in the format: **#SCT: <ICT>,<OCT>** where: **<ICT>** - Incoming Call Timer string, in the format: "hh:mm:ss", where hh - hour mm - minute ss - seconds **<OCT>** - Outgoing Call Timer string, in the format: "hh:mm:ss", where hh - hour mm - minute ss - seconds
AT#SCT=?	Test command returns the OK result code.

5.6.1.80. Show Call Information - #SCI

#SCI – Show Call Information	
AT#SCI	Execution command returns the value stored in USIM field Incoming Call Information, which contains the time of the call and duration of the last calls, and the value stored in the USIM field Outgoing Call Information, that contains time of the call and duration of the last calls, in the format: **#SCI:** **<index1>,<number>,<text>,<callTime>,<callDuration>[,<status>]<CR><LF>** **#SCI:** **<index2>,<number>,<text>,<callTime>,<callDuration>[,<status>][…]]]** where: **<index*n*>** - the type of the entry (1: incoming call; 2: outgoing call) **<number>** - string type phone number **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS** **<callTime>** - call time yy/MM/dd,hh:mm:ss±zz, where yy - year MM - month dd - day hh - hour mm - minute ss - seconds ±zz - time zone **<callDuration>** - call duration in the format: "hh:mm:ss", where hh - hour mm - minute

#SCI – Show Call Information	
	ss - seconds <**status**> - only for incoming calls, call status (0: answered: 1: not answered)
AT#SCI=?	Test command returns the OK result code.

5.6.1.81. USB Configuration - #USBCFG

#USBCFG- USB Configuration	
AT#USBCFG=<mode>	Set command sets the USB compostion according to <mode> number given, where: 0 – use 0x1042 composition file 1 – use 0x1040 composition file 2 – use 0x1041 composition file 3 – use 0x1043 composition file 4 – use 0x1044 composition file 5 – use 0x1045 composition file 0x1042: Rndis + DIAG + ADB + NMEA + MODEM + MODEM + AUX 0x1040: DIAG + ADB + RMnet + NMEA + MODEM + MODEM + AUX 0x1041: DIAG + ADB + MBIM +| NMEA + MODEM + MODEM + AUX 0x1043: DIAG + ADB + ECM + NMEA + MODEM + MODEM + AUX 0x1044: MBIM 0x1045: Rndis + DIAG + ADB+NMEA + MODEM + MODEM + AUX + Audio Note: The modem device reset, automatically and new USB composition applied from the next boot up time, if this command is done, successfully. Note: The value stored in file system region whenever Set command executed. Note: Regarding PID_0x1045, USB will enumerlate when sound device is ready state. Note: If USBCFG is 4, it is MBIM only mode. For that reason, you can not change the USB composition. If you want to change the USB composition, please use Main Uart.
AT#USBCFG?	Read command returns the current compostion set by number as detailed in the section above: 0x1042 composition file return 0 0x1040 composition file return 1 0x1041 composition file return 2 0x1043 composition file return 3 0x1044 composition file return 4 0x1045 composition file return 5
AT#USBCFG=?	Test command returns the list of supported values.

5.6.1.82. Request International Mobile station Equipment Identity and Software Version - +IMEISV

+IMEISV – Request International Mobile station Equipment Identity and Software Version	
AT+IMEISV	Execution command returns the International Mobile station Equipment Identity and Software Version Number, identified as the IMEISV of the mobile, without command echo. The IMEISV is composed of the following elements (each element shall consist of decimal digits only): - Type Allocation Code (TAC). Its length is 8 digits; - Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits; - Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.
AT+IMEISV=?	Test command returns **OK** result code.
Reference	3GPP TS 23.003

5.6.1.83. Enable URC of Enhanced Operator Name String - #EONS

#EONS - Enable URC of Enhanced Operator Name String	
AT#EONS=<ena>	Set command enables URC & feature of EONS. Parameter **<ena>**: 0 - Disable URC & Feature of EONS 1 - Enable URC & Feature of EONS **#EONS: <net>** where: **<net>** : Alpha tag of network name Note: Name string can be any network name as well as EONS and sent by its priority. The following order of priority for which “name source” is to be used: 1. EF-SPN. 2. EF-OPL and EF-PNN. 3. CPHS Operator Name String. 4. Name Information received by the NITZ service. 5. Any name stored internal to the ME. 6. Displaying the broadcast MCC-MNC.
AT#EONS?	Read command returns the current selected parameter in the format:

#EONS - Enable URC of Enhanced Operator Name String	
	#EONS: <ena>[, <net>] Note: Name string is shown only when network service is available.
AT#EONS=?	Test command returns the supported range of values of parameters **<ena>**.

5.6.1.84. WCDMA domain selection - #WCDMADOM

#WCDMADOM – WCDMA domain selection	
AT#WCDMADOM =<dom>	This command selects the WCDMA domain. Parameter: **<dom>** 0 – R99 1 – R5 (HSDPA) 2 – R6 (HSUPA) 3 – R7 (HSUPA&HSDPA) 4 – R8 5 – R9 (factory default) 6 – R10 Note: The parameter **<dom>** is saved in the NVM. Need to power cycle the unit for the setting to take effect.
AT#WCDMADOM ?	Read command reports the current selected <**dom**> parameter in the format: **#WCDMADOM: <dom>**
AT#WCDMADOM =?	Test command reports the supported range of value for parameter **<dom>**.

5.6.1.85. Ciphering Indication - #CIPHIND

#CIPHIND – Ciphering Indication	
AT#CIPHIND=[<mode>]	Set command enables/disables unsolicited result code for cipher indication. The cipheri ng indicator feature allows to detect that ciphering is not switched on and to indicate thi s to the user. The ciphering indicator feature may be disabled by the home network ope rator setting data in the SIM/USIM. If this feature is not disabled by the SIM/USIM, th en whenever a connection is in place, which is unenciphered, or changes from ciphered to unenciphered or vice versa, an unsolicited indication shall be given to the user. Parameter: **<mode>** 0 – disable #CIPHIND unsolicited result code (factory default) 1 – enable #CIPHIND unsolicited result code **#CIPHIND: <mode>**
AT#CIPHIND?	Read command reports the current <**mode**>,<**cipher**> and <**SIM/USIM flag**> in the f ormat:

#CIPHIND – Ciphering Indication	
	#CIPHIND: <**mode**>,<**cipher**>,<**SIM/USIM flag**> where **<mode>** 0 – #CIPHIND unsolicited result code disabled 1 – #CIPHIND unsolicited result code enabled **<cipher>** – cipher status 0 – cipher off 1 – cipher on 2 – unknown (missing network information) < **SIM/USIM flag** > – SIM/USIM cipher status indication enabling 0 – disabled 1 – enabled 2 – unknown (flag not read yet)
AT#CIPHIND=?	Test command reports the range for parameter **<mode>**.

5.6.1.86. Non-Access–Stratum Compliance - #NASC

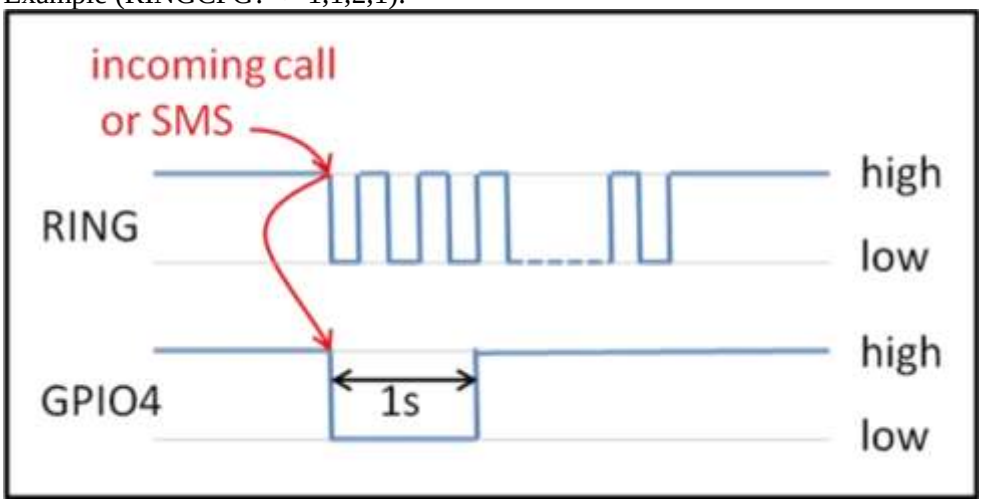
#NASC – Non-Access-Stratum Compliance	
AT#NASC=<mode>	Set command allows to selects NAS compliance. Parameter: **<mode>** – NAS specification-compliant 0 – Forces UE to Release 99 NAS specification-compliant 1 – Forces UE to Release 5 NAS specification-compliant 2 – Forces UE to Release 6 NAS specification-compliant 3 – Forces UE to Release 7 NAS specification-compliant (factory default) 4 – Forces UE to Release 10 NAS specification-compliant 5 – Forces UE to Release 11 NAS specification-compliant Note: The parameter **<mode>** is saved in the NVM. Need to power cycle the unit for the setting to take effect.
AT#NASC	Execution command returns the setting to the default value.
AT#NASC?	Read command reports the current value of the patameter <**mode**> in the format: **#NASC: <mode>**
AT#NASC=?	Test command reports the supported range of value for parameter **<mode>**.

5.6.1.87. User Determined User Busy - #UDUB

#UDUB – User Determined User Busy	
AT#UDUB	Execution command disconnects all active calls (like **ATH** or **AT+CHUP**), but setting the “user busy” cause for disconnection (only if we have an incoming call that has not been answered yet, and that we want to reject).

#UDUB – User Determined User Busy	
AT#UDUB=?	Test command returns the **OK** result code

5.6.1.88. Set RING CFG Parameters - #WKIO

#WKIO – Set RING CFG Parameter	
AT#WKIO=[<Mode> [,<Pin> [,<Trigger>[,<Timer>]]]]	Set command configures the service. **Parameter:** <**Mode**>: Enable/Disable for the feature 0 – Disable (default) 1 – Enable <**Pin**>: Set the outputs line for wakeup detection 0 – Ring Only (default) 1 – Ring & GPIO 4. 2 – GPIO 4 3 – No Pins <**Trigger**>: Line will be Wakeup By 0 – SMS 1 – CALL 2 – SMS or CALL (default) <**Timer**>: Set the time interval for the wakeup line to be at HIGH state range (1-60) Sec. default 1 sec. Example (RINGCFG? -> 1,1,2,1):  Note: 1. To received Pulse in the ring line you need to set AT\R=2 and save profile (the ring wave shape will be Pulse only when call received). 2. To be able to wake up by SMS need to set the command AT#E2SMSRI at power up

#WKIO – Set RING CFG Parameter	
AT#WKIO?	Read command returns the current settings of parameters in the format: **#WKIO: <Mode>,<Pin>,<Trigger>,<Timer>**
AT#WKIO=?	Test command returns the supported values for the RINGCFG parameters: **#WKIO: (0,1),(0-3),(0-2),(1-60)**

5.6.1.89. Manual Closed Subscriber Group Search - #MCSGS

#MCSGS – Manual Closed Subscriber Group Search	
AT#MCSGS	Execution command used to request Manual CSG Search. If CSG search launched successfully returns OK. **Note 1**: if module registered on VPLMN return error: "operation not supported" **Note 2**: if previous powerup/periodic/manual CSG search didn't finished yet return error: "wrong state" **Note 3**: if used inappropriate SIM or file EFCSGL empty return error: "SIM wrong" **Note 4**: periodic CSG search run every 125 min (or 125 min after last successful manual CSG search)
AT#MCSGS?	Read command reports the state of CSG search and CSG registration. #MCSGS:<**CSG_search_state**>,<**CSG_registration_state**> <**CSG_search_state**> 0 – No active CSG search 1 – power-up CSG search 2 – periodic CSG search 3 – manual CSG search <**CSG_registration_state**> 0 – inactive CSG registration 1 – active CSG registration
Note	for AT&T

5.6.1.90. Hang Up Call - #CHUP

#CHUP - Hang Up Call	
AT#CHUP	Execution command ends all active and held calls, also if a multi-party session is running. It also allows disconnecting of a data call from a CMUX instance different from the one that was used to start the data call.
AT#CHUP=?	Test command returns the **OK** result code

5.6.1.91. No Carrier Indication Handling - #NCIH

#NCIH – NO CARRIER Indication Handling	
AT#NCIH=<enable>	Set command enables/disables sending of a **NO CARRIER** indication when a remote call that is ringing is dropped by calling party before it is answered at called party. Parameter: **<enable>** - NO CARRIER indication sending 0 - Disabled (factory default) 1 - Enabled
AT#NCIH?	Read command reports whether the feature is currently enabled or not, in the format: **#NCIH: <enable>**
AT#NCIH=?	Test command returns the supported range of values for parameter **<mode>**.

5.6.1.92. CMUX Mode Set - #CMUXMODE

#CMUXMODE – CMUX Mode Set	
AT#CMUXMODE=<mode>	Set command specifices the CMUX mode Parameters: **<mode>** multiplexer transparency mechanism 0 - Ignore DTR feature is disabled, a transmission of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode**. (default)** 1 – Ignore DTR feature is disabled, a transmission of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode 5 – Ignore DTR feature is enabled, the DCE doesn't care the physical DTR line transitions Note : DLC establishment on Virtual Channel between mode 0 and mode 1 is different. See Telit Multiplxer SW User Guide for the detailed information Note : a software or hardware reset restores the default value. Note : during cmux session the set command will return **ERROR,** only the read and test command can be used.
AT#CMUXMODE?	Read command returns the current value of **<mode> parameter.** **+CMUXMODE: <mode>**
AT#CMUXMODE=?	Test command returns the range of supported values for parameter **<mode>**

5.6.1.93. Dormant Control Command - #CDORM

#CDORM – Dormant control command

#CDORM – Dormant control command	
AT#CDORM= <action> [,<cid>]	Set command used to: 1. Enable/Disable the indication of dormant mode. 2. Fast dormancy When the indication is enabled, an unsolicited report with current status (dormant or active) per packet call will be sent to the DTE. Then, an update report sent to the DTE each time a change detected on status. **Parameters:** **<action>** - 0 - Disable the dormant status unsolicited result code (default). 1 - Enable the dormant status unsolicited result code : **#CDORM: <call_id>,<dormant_status>** Where: **<dormant_status>** - 0 – call is in dormant mode 1 – call is in active mode 2 - Go to dormant(fast dormancy) **<cid>** - PDP context identifier 1..16 - numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) **Note** : Action 1, 2 can use only 3G network
AT#CDORM?	The read command returns the current settings and status. **#CDORM:<unsolicited_status>[,<cid>,<dormant_status>][<CR><LF>** **#CDORM:<unsolicited_status>,<cid>,<dormant_status>[…]]** **OK** **Where: <unsolicited_status>** 0 - Disabled unsolicited indication 1 – Enabled unsolicited indication The default value is 0.
AT#CDORM=?	The test command returns the possible ranges of **<action>** and **<cid>**
Reference	

5.6.1.94. Enable RX Diversity and set DARP - #RXDIV

#RXDIV – enable RX Diversity and set DARP	
AT#RXDIV= <DIV_enable> [,<DARP_mode>]	This command enables/disables the RX Diversity and sets the DARP. Parameters: **<DIV_enable>**

#RXDIV – enable RX Diversity and set DARP	
	RX Diversity 0 – Disable the RX Diversity 1 – Enable RX Diversity(default value). **<DARP_mode>** DARP mode 0 - DARP not supported (default value) (It has no effect and is included only for backward compatibility) 1 - DARP phase 1 Note : The values set by command are directly stored in NVM. They are available at next power on. The LE922A6 A1 module does NOT support GSM tech, so DARP mode is not support.
AT#RXDIV?	Read command reports the currently selected **<DIV_enable>** and **<DARP_mode>**parameters in the format: **#RXDIV:<DIV_enable>,<DARP_mode>**
AT#RXDIV=?	Test command reports the supported range of values for parameters **<DIV_enable>** and **<DARP_mode>**

5.6.1.95. Enable LTE RX Diversity - #LRXDIV

#LRXDIV – Enable LTE RX Diversity	
AT#LRXDIV=<Ldiv_enable>	This command enables or disables LTE Rx Diversity and moves the LTE-RX receiver from the main antenna to the diversity antenna. Parameters: **< Ldiv_enable >** 0 - Disables the LTE RX Diversity. (Only use Rx0) 1 - Enables the LTE RX Diversity. (Use Rx0 and Rx1, Factory default) 2 - Set the RX to the diversity Antenna. (only use Rx1) Note: Rx0 (Main Antenna), Rx1 (Diversity Antenna) Note: The values set by command are directly stored in EFS file. They are available at next power on. (Qualcomm Limitation.) Note: This command only have to use for the purpose of test.
AT#LRXDIV?	Read command reports the currently selected **< Ldiv_enable >** parameters in the format: **#LRXDIV: < Ldiv_enable >**
AT#LRXDIV=?	Test command reports the supported range of values for parameters **<Ldiv_enable>.**

5.6.1.96. Enable Test Mode command in not signalling mode - #TESTMODE

#TESTMODE – Enable Test Mode command in not signalling mode	
AT#TESTMODE=<command>	The command allows setting module in not signalling mode. The functionality has to be first activated by sending **AT#TESTMODE="TM**", which sets the module in Test Mode. Only after this set, **AT#TESTMODE** can be used with the other allowed

#TESTMODE – Enable Test Mode command in not signalling mode

commands. To exit from Test Mode and go back to Operative Mode, the command **AT#TESTMODE ="OM"** has to be sent.

Parameter:
<command >:

- "TM"→ forces the module in Test Mode;
- "OM"→ forces the module in Operative Mode
- "TCH"→starts the non-stop module transmission.
  It enables TX power.
- "ESC"→ exits the current non-stop sequence.
  It must be used to stop TX transmission and RX chain disable.

4G commands:

- "SETLTEBAND <LTE Band>"→ sets the LTE band

LTE Band	Description
3	B 3 (1,800Mhz)
7	B 7 (2,600Mhz)
20	B 20 (800Mhz)

- "LTXBW"→ sets the TX bandwidth to 10MHz.
- "LRXBW"→ sets the RX bandwidth to 10MHz.
- "CH < EARFCN UL>"→ sets the EARFCN.

EARFCN UL	Description
19200 ~ 19949	B 3
20750 ~ 21449	B 7
24150 ~ 24449	B 20

- Recommend "CH < EARFCN UL>"

EARFCN UL	Description	Recommend EARFCN
19200 ~ 19949	B 3	19575
20750 ~ 21449	B 7	21100
24150 ~ 24449	B 20	24300

- "LTXWAVEFORM"→ sets the WAVEFORM transmission.
- "LPASTATE" → sets the PA STATE to high gain state.
- "LTXGAIN <TXGAIN_IDX>"→ sets the value for desired TX power strength

<table>
<tr><th colspan="2">#TESTMODE – Enable Test Mode command in not signalling mode</th></tr>
<tr><td></td><td>

Recommend “TXGAIN_IDX” value

<table>
<tr><th>MODEL</th><th>BAND</th><th>TXGAIN _IDX</th><th>TX Power</th></tr>
<tr><td rowspan="3">LE922A6-E1</td><td>3</td><td>65 ~ 68</td><td rowspan="3">23dBm</td></tr>
<tr><td>7</td><td>67 ~ 71</td></tr>
<tr><td>20</td><td>64 ~ 65</td></tr>
</table>

“LNA4G” → sets 4G LNA GAIN STATE.
“PRXRL4G” → reads the 4G Rx power level of primary path for selected channel.
“DRXRL4G” → reads the 4G Rx power level of secondary path for selected channel.

Note
- Bands support varies depending on the product

Note 1: This command should be checked individually.
Note 2: LE922A6-E1 4G Support band – LTE 3,7,20.
Note 3: In Test Mode, the other AT commands should not use.
Note 4: The Test Mode Status is stored in NVM
Note 5: “TM” command only can set on the Online mode.
Note 6: Must #TESTMODE issuing according to recommended Example.
Note 7: In case of “PRXRL4G” command, we only guarantee readable Primary RX range from -50dBm to -70dBm, because chipset has limitation.
Note 8: In case of “DRXRL4G” command, we only guarantee readable Secondary RX range from -50dBm to -70dBm, because chipset has limitation.
Note 9: In case of 4G, Signal generator CW(unmodulated)signal must be set Frequency to “Fc + 500khz”.
500khz offset from center frequency should be set to avoid DC(0 Hz).
Note 10: After One band check is finished, must set the “ESC” and “OM” Command.
Note 11: After #TESTMODE command finish modem have to reboot.
</td></tr>
<tr><td>AT#TESTMODE?</td><td>Read command reports the currently selected <command> in the format:

#TESTMODE: <TestModeStatus>
Where:
<TestModeStatus> can assume the following values:
- 1 if the module is in Test Mode
- 0 if the module is in Operative Mode</td></tr>
<tr><td>AT#TESTMODE=?</td><td>Test command returns the OK result code</td></tr>
<tr><td>Example:</td><td>< LE922A6-E1>
1. Recommend 4G TX test sequence is below :</td></tr>
</table>

#TESTMODE – Enable Test Mode command in not signalling mode	
	- AT#TESTMODE=”TM” - AT#TESTMODE=”SETLTEBAND 3’ - AT#TESTMODE=”LTXBW” - AT#TESTMODE=”LRXBW” - AT#TESTMODE=”CH 19575” - AT#TESTMODE=”TCH’ - AT#TESTMODE=”LTXWAVEFORM” - AT#TESTMODE=”LPASET” - AT#TESTMODE=”LTXGAIN 65” - AT#TESTMODE=”ESC” - AT#TESTMODE=”OM” - AT#TESTMODE=”REBOOT” **2. Recommend 4G RX test sequence is below :** - AT#TESTMODE=”TM” - AT#TESTMODE=”SETLTEBAND 3’ - AT#TESTMODE=”LTXBW” - AT#TESTMODE=”LRXBW” - AT#TESTMODE=”CH 19575” - AT#TESTMODE=”LNA4G” - AT#TESTMODE=”PRXRL4G” – for check primary antenna path. PRXRL4G: -67 - AT#TESTMODE=”DRXRL4G” – for check secondary antenna path. DRXRL4G: -67 - AT#TESTMODE=”ESC” - AT#TESTMODE=”OM” - AT#REBOOT

5.6.2. Easy Scan® Extension AT Commands

Note: It is strongly suggested to issue all the Easy Scan® Extension AT commands with NO SIM inserted, to avoid a potential conflict with normal module operations, such as “incoming call”, “periodic location update, “periodic routing area update” and so on.

4G/3G only products like LE922A6-A1 does not support GSM access technology. It could not perform a survey of the channels belonging to GSM.

4G only products like LE922A6-E1 does not support GSM and UTRA access technology. It could not perform a survey of the channels belonging to GSM and UTRA.

Some commands report LTE channels only if the module camped on LTE cell.
: #CSURV, #CSURVC, #CSURVU and #CSURVUC.

Below commands could not indicate LTE channels.
: #CSURVB, #CSURVBC, #CSURVP and #CSURVPC.

The #CSURVF, #CSURVNLF support GWL.

5.6.2.1. Network Survey - #CSURV

#CSURV - Network Survey	
AT#CSURV[= [<s>,<e>]]	Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURV<CR>**, a full band scan is performed. **Parameters:** **<s>** - starting channel **<e>** - ending channel After issuing the command the device responds with the string: **Network survey started…** and, after a while, a list of informations, one for each received carrier, is reported, each of them in the format: In 3G **uarfcn: <uarfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> scr code: <scrcode> cellId: <cellId> lac: <lac> cellStatus: <cellStatus> rcsp: <rscp> ecio: <ecio>** **<CR><LF><CR><LF><CR><LF>** **where:** **<uarfcn>** - The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number. **<rxLev>** - decimal number; it is the receiption level (in dBm). **<mcc>** - hexadecimal 3-digits number; it is the mobile country code. **<mnc>** - hexadecimal 2-digits number; it is the mobile network code. **<scrcode>** - decimal number; it is the scrambling code. **<cellId>** - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number. **<lac>** - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number. **<cellStatus>** - string type; it is the cell status. CELL_SUITABLE - C0 is a suitable cell. CELL_LOW_PRIORITY - the cell is low priority based on the received system information. CELL_FORBIDDEN - the cell is forbidden. CELL_BARRED - the cell is barred based on the received system information. CELL_LOW_LEVEL - the cell **<rxLev>** is low. CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH available…etc. **<rscp>** - decimal number; it is the received signal code power (in dBm). **<ecio>** - decimal number; it is the ratio of received power of the carrier to the all

#CSURV - Network Survey	
	over noise (in dBm). In 4G (partly implemented) Currently work only if module camped on LTE cell. For serving cell: **earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> cellId: <cellId> tac: <tac>** For neighbor cell: **earfcn: <earfcn> rxLev: <rxLev> cellId: <cellId>** **Where:** <earfcn> - E-UTRA Assigned Radio Channel. <tac> - Tracking Area Code. if #CSURVF last setting is 0, <cellId> is a decimal number, else it is a 4-digits hexadecimal number. Lastly, the **#CSURV** output ends in two ways, depending on the last **#CSURVF** setting: if **#CSURVF=0** or **#CSURVF=1** The output ends with the string: **Network survey ended** if **#CSURVF=2** the output ends with the string: **Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)** **Where**: **<NoARFCN>** - number of scanned frequencies **<NoBCCH>** - number of found BCCh
Example	AT#CSURV Network survey started ... earfcn: 200 rxLev: -55 mcc: 450 mnc: 05 cellId: 501 tac: 12559 earfcn: 200 rxLev: -73 cellId: 69 earfcn: 1350 rxLev: -70 cellId: 218 earfcn: 1350 rxLev: -70 cellId: 69 uarfcn: 10836 rxLev: -50 mcc: 450 mnc: 08 scr code: 1488 cellId: 14909569 lac: 7 170 cellStatus: CELL_FORBIDDEN rscp: -59 ecio: -9.5 uarfcn: 10812 rxLev: -51 mcc: 450 mnc: 08 scr code: 1488 cellId: 14909568 lac: 7

#CSURV - Network Survey	
	170 cellStatus: CELL_FORBIDDEN rscp: -56 ecio: -5.5 uarfcn: 10812 rxLev: -52 mcc: 450 mnc: 08 scr code: 4176 cellId: 14909572 lac: 7 170 cellStatus: CELL_FORBIDDEN rscp: -63 ecio: -11.5 uarfcn: 10737 rxLev: -52 mcc: 450 mnc: 05 scr code: 240 cellId: 63809028 lac: 86 73 cellStatus: CELL_SUITABLE rscp: -57 ecio: -5.5 uarfcn: 10713 rxLev: -43 mcc: 450 mnc: 05 scr code: 240 cellId: 63809024 lac: 86 73 cellStatus: CELL_SUITABLE rscp: -48 ecio: -5.5 uarfcn: 10713 rxLev: -43 mcc: 450 mnc: 05 scr code: 240 cellId: 63809024 lac: 86 73 cellStatus: CELL_SUITABLE rscp: -47 ecio: -4.0 Network survey ended
Note	1. The command is executed within max. 2 minute.

5.6.2.2. Network Survey (Numeric Format) - #CSURVC

#CSURVC - Network Survey (Numeric Format)	
AT#CSURVC[= [<s>,<e>]]	Execution command allows to perform a quick survey through channels belonging to the band selected by last #BND command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVC<CR>**, a full band scan is performed. **Parameters:** **<s>** - starting channel **<e>** - ending channel After issuing the command the device responds with the string: **Network survey started…** and, after a while, a list of informations, one for each received carrier, is reported, each of them in the format: In 3G **<uarfcn>,<rxLev>,<mcc>,<mnc>,<scrcode>,<cellId>,<lac>,<cellStatus>, <rscp>,<ecio>** **<CR><LF><CR><LF><CR><LF>** **where:** **<uarfcn>** - The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number **<rxLev>** - decimal number; it is the receiption level (in dBm)

#CSURVC - Network Survey (Numeric Format)	
	<mcc> - hexadecimal 3-digits number; it is the mobile country code **<mnc>** - hexadecimal 2-digits number; it is the mobile network code **<scrcode>** - decimal number; it is the scrambling code **<cellId>** - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number **<lac>** - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number **<cellStatus>** - numeric type; it is the cell status ..0 - C0 is a suitable cell (CELL_SUITABLE). 1 - the cell is low priority based on the received system information (CELL_LOW_PRIORITY). 2 - the cell is forbidden (CELL_FORBIDDEN). 3 - the cell is barred based on the received system information (CELL_BARRED). 4 - the cell **<rxLev>** is low (CELL_LOW_LEVEL). 5 - none of the above e.g. exclusion timer running, no BCCH available…etc.. (CELL_OTHER). **<rscp>** - decimal number; it is the received signal code power (in dBm). **<ecio>** - decimal number; it is the ratio of received power of the carrier to the all over noise (in dBm). In 4G (partly implemented) Currently work only if module camped on LTE cell. For serving cell: **<earfcn>,<rxLev, <mcc>,<mnc>, <cellId>,<tac>** For neighbor cell: **<earfcn>,<rxLev>,<cellId>** **Where:** **<earfcn>** - E-UTRA Assigned Radio Channel **<tac>** - Tracking Area Code. if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number The last information from **#CSURVC** depends on the last **#CSURVF** setting: When **#CSURVF=0** or **#CSURVF=1** The output ends with the string "**Network survey ended"** when **#CSURVF=2** the output ends with the string "**Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)** **Where:** **<NoARFCN>** - number of scanned frequencies **<NoBCCH>** - number of found BCCh
Example	AT#CSURVC Network survey started ...

#CSURVC - Network Survey (Numeric Format)	
	200,-51,450,05,501,12559 200,-69,294 200,-69,69 200,-69,419 1350,-70,419 1350,-70,69 1350,-69,294 1350,-69,218 1350,-69,252 10737,-45,450,05,240,63809028,8673,0 -49 -4.0 10812,-47,450,08,1488,14909568,7170,2 -50 -3.5 10836,-47,450,08,1488,14909569,7170,2 -51 -4.0 10713,-48,450,05,240,63809024,8673,0 -55 -7.5 Network survey ended OK
Note	The command is executed within max. 2 minute. The information provided by #CSURVC is the same as that provided by #CSURV. The difference is that the output of #CSURVC is in numeric format only.

5.6.2.3. Network Survey Of User Defined Channels - #CSURVU

#CSURVU - Network Survey Of User Defined Channels	
AT#CSURVU=[<ch1>[,<ch2>[,… [,<ch10>]]]]	Execution command allows performing a quick survey through the given channels. The range of available channels depends on the last #BND issue. The result format is like command #CSURV. In 4G (partly implemented) Currently work only if module camped on LTE cell. **Parameters:** **<chn>** - channel number (ARFCN (in case of 2G), UARFCN (in case of 3G),

#CSURVU - Network Survey Of User Defined Channels	
	EARFCN (in case of 4G)). **Note:** the <chn> must be selected in same RAT.
Example	AT#CSURVU=1350,10812 Network survey started ... earfcn: 1350 rxLev: -72 cellId: 419 earfcn: 1350 rxLev: -72 cellId: 294 earfcn: 1350 rxLev: -72 cellId: 252 earfcn: 1350 rxLev: -72 cellId: 218 uarfcn: 10812 rxLev: -55 mcc: 450 mnc: 08 scr code: 1488 cellId: 14909568 lac: 7 170 cellStatus: CELL_FORBIDDEN rscp: -66 ecio: -11.5 uarfcn: 10812 rxLev: -54 mcc: 450 mnc: 08 scr code: 4176 cellId: 14909572 lac: 7 170 cellStatus: CELL_FORBIDDEN rscp: -64 ecio: -10.0 Network survey ended OK
Note	The command is executed within max. 2 minute.

5.6.2.4. Network Survey Of User Defined Channels (Numeric Format) - #CSURVUC

#CSURVUC - Network Survey Of User Defined Channels (Numeric Format)	
AT#CSURVUC=[<ch1>[,<ch2>[,… [,<ch10>]]]]	Execution command allows performing a quick survey through the given channels. The range of available channels depends on the last #BND issue. The result format is like command #CSURVC. In 4G (partly implemented) Currently work only if module camped on LTE cell. **Parameters:** **<chn>** - channel number (ARFCN (in case of 2G), UARFCN (in case of 3G), EARFCN (in case of 4G)). **Note:** the <chn> must be selected in same RAT.
Example	AT#CSURVUC=1350,10812 Network survey started ...

#CSURVUC - Network Survey Of User Defined Channels (Numeric Format)	
	1350,-71,252 1350,-71,419 1350,-71,294 10812,-51,450,08,1488,14909568,7170,2 -56 -5.5 10812,-51,450,08,4944,14909988,7170,2 -64 -13.5 Network survey ended OK
Note	The command is executed within max. 2 minute. The information provided by #CSURVUC is the same as that provided by #CSURVU. The difference is that the output of #CSURVUC is in numeric format only.

5.6.2.5. BCCH Network Survey - #CSURVB

#CSURVB - BCCH Network Survey	
AT#CSURVB=[<n>]	Execution command performs a quick network survey through M (maximum number of available frequencies depending on last selected band and RAT) channels. The survey stops as soon as <n> BCCH carriers are found. The result format is like command #CSURV. **Parameter:** **<n>** - number of desired BCCH carriers 1..M
AT#CSURVB=?	Test command reports the range of values for parameter <n> in the format: (1-M) where M is the maximum.

5.6.2.6. BCCH Network Survey (Numeric Format) - #CSURVBC

#CSURVBC - BCCH Network Survey (Numeric Format)	
AT#CSURVBC=[<n>]	Execution command performs a quick network survey through M (maximum number of available frequencies depending on last selected band and RAT) channels. The survey stops as soon as <n> BCCH carriers are found. The result is given in numeric format and is like command #CSURVC. **Parameter:**

#CSURVBC - BCCH Network Survey (Numeric Format)	
	<n> - number of desired BCCH carriers 1..M
AT#CSURVBC=?	Test command reports the range of values for parameter <n> in the format: (1-M) Where M is the maximum number of available frequencies depending on last selected band and RAT.

5.6.2.7. Network Survey Format - #CSURVF

#CSURVF - Network Survey Format	
AT#CSURVF= [<format>]	Set command controls the format of the numbers output by all the Easy Scan® . **Parameter:** **<format>** - numbers format 0 - Decimal 1 - Hexadecimal values, no text (for formats 0 and 1 - the output ends with the string: "Network survey ended") 2 - Hexadecimal values with text the output ends with the string: Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>) **Where:** **<NoARFCN>** - number of scanned frequencies **<NoBCCH>** - number of found BCCh
AT#CSURVF?	Read command reports the current number format, as follows: #CSURVF: <format>
AT#CSURVF=?	Test command reports the supported range of values for the parameter <format>.

5.6.2.8. <CR><LF> Removing On Easy Scan® Commands Family - #CSURVNLF

#CSURVNLF - <CR><LF> Removing On Easy Scan® Commands Family	
AT#CSURVNLF= [<value>]	Set command enables/disables the automatic <CR><LF> removing from each information text line. **Parameter:** **<value>** 0 - disables <CR><LF> removing; they'll be present in the information text (factory default) 1 - remove <CR><LF> from imformation text
AT#CSURVNLF?	Read command reports whether automatic <CR><LF> removing is currently enabled or not, in the format:

#CSURVNLF - <CR><LF> Removing On Easy Scan® Commands Family	
	<value>
AT#CSURVNLF=?	Test command reports the range of values for parameter <value>.

5.6.2.9. PLMN Network Survey - #CSURVP

#CSURVP - PLMN Network Survey	
AT#CSURVP= <plmn>	Execution command performs a quick network survey through channels. The survey stops as soon as a BCCH carriers belonging to the selected PLMN is found. The result format is like command #CSURV. **Parameter:** **<plmn>** - the desidered PLMN in numeric format
AT#CSURVP=?	Test command returns OK

5.6.2.10. PLMN Network Survey (Numeric Format) - #CSURVPC

#CSURVPC - PLMN Network Survey (Numeric Format)	
AT#CSURVPC= <plmn>	Execution command performs a quick network survey through channels. The survey stops as soon as a BCCH carriers belonging to the selected PLMN is found. The result is given in numeric format and is like command #CSURVC. **Parameter:** **<plmn>** - the desidered PLMN in numeric format
AT#CSURVPC=?	Test command returns OK

5.6.3. AT Run Commands

5.6.3.1. Enable SMS Run AT Service – #SMSATRUN

#SMSATRUN – Enable SMS AT Run service	
AT#SMSATRUN= <mod>	Set command enables/disables the SMS AT RUN service. Parameter: **< mod >** 0: Service Disabled 1: Service Enabled Note: the current settings are stored in NVM. Note: while the SMS Run AT service executes a command that takes long time to get the response, a new command will be pending until the module has finished sending all of its response result code.

#SMSATRUN – Enable SMS AT Run service	
	Note: In the Digest SMS run AT mode, the following 4 commands using SMS AT RUN channel cannot be executed. - **AT#SMSATWL** - **AT#TCPATRUNFRWL** - **AT#FRWL** - **AT+CLCK**
AT#SMSATRUN?	Read command returns the current settings of <mode> and the value of <stat> in the format: **#SMSATRUN: <mod>,<stat>** where: **<stat>** - service status 0 – not active 1 - active
AT#SMSATRUN =?	Test command returns the supported values for the SMSATRUN parameters
Notes:	• By default the SMS ATRUN service is disabled It can be activated either by the command AT#SMSATRUN.

5.6.3.2. Set SMS Run AT Service parameters - #SMSATRUNCFG

#SMSATRUNCFG – Set SMS AT Run Parameters	
AT#SMSATRUNCFG= <instance> [,<urcmod> [,<timeout>]]	Set command configures the SMS AT RUN service. Parameter: **<instance>:** AT instance that will be used by the service to run the AT Command. Range 1- 3, default 3. Note: In LE922A6, <**instance**> parameter is not supported and SMS Run AT service has its independent channel. This parameter is dummy for unified policy. **<urcmod>:** 0 – disable unsolicited message 1 - enable an unsolicited message when an AT command is requested via SMS (default). When unsolicited is enabled, the AT Command requested via SMS is indicated to TE with unsolicited result code: #SMSATRUN: <Text> e.g.: #SMSATRUN: AT+CGMR;+CGSN;+GSN;+CCLK Unsolicited is dumped on the instance that requested the service activation.

#SMSATRUNCFG – Set SMS AT Run Parameters	
	<timeout>: It defines in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. Range 1 – 60, default 5. Note 1: the current settings are stored in NVM. Note 2: SMS Run AT service and EvMoni service share the same channel. For the unified policy, when the #SMSATRUNCFG sets the <**instance**> parameter, the change is reflected also in the <**instance**> parameter of the #ENAEVMONICFG command, and viceversa. Note 3: the set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUN? returns 1 as <mod> parameter
AT#SMSATRUNCFG?	Read command returns the current settings of parameters in the format: **#SMSATRUNCFG:<instance>,<urcmod>,<timeout>**
AT#SMSATRUNCFG=?	Test command returns the supported values for the SMSATRUNCFG parameters

5.6.3.3. SMS AT Run White List – #SMSATWL

#SMSATWL – SMS AT Run White List	
AT#SMSATWL=<action>,<index>[,<entryType>[,<string>]]	Set command to handle the white list. **<action >:** 0 – Add an element to the WhiteList 1 – Delete an element from the WhiteList 2 – Print and element of the WhiteList **< index >:** Index of the WhiteList. Range 1-8 **< entryType >:** 0 – Phone Number 1 – Password NOTE: A maximum of two Password Entry can be present at same time in the white List **<string>:** string parameter enclosed between double quotes containing or the phone number or the password Phone number shall contain numerical characters and/or the character “+” at the

#SMSATWL – SMS AT Run White List	
	beginning of the string and/or the character "*" at the end of the string. Password shall be 16 characters length NOTE: When the character "*" is used, it means that all the numbers that begin with the defined digit are part of the white list. E.g. "+39*" All Italian users can ask to run AT Command via SMS "+39349*" All vodafone users can ask to run AT Command via SMS.
AT#SMSATWL?	Read command returns the list elements in the format: **#SMSATWL: [<entryType>,<string>]**
AT#SMSATWL=?	Test command returns the supported values for the parameter **<action>, <index>** and **<entryType>**

5.6.3.4. Set TCP Run AT Service parameter - #TCPATRUNCFG

#TCPATRUNCFG – Set TCP AT Run Service Parameters	
AT#TCPATRUNCFG= **<connId>** **,<instance>** **,<tcpPort>** **,<tcpHostPort>** **,<tcpHost>** **[,<urcmod>** **[,<timeout>** **[,<authMode>** **[,<retryCnt>** **[,<retryDelay>]]]]]**	Set command configures the TCP AT RUN service. Parameters: **<connId>** Socket connection identifier. Default 1. Range 1..6. This parameter is mandatory. **<instance >** AT instance that will be used by the service to run the AT Command. Default 2. Range 1 – 3. This parameter is mandatory. Note: In LE922A6, <**instance**> parameter is not supported and TCP Run AT service has its independent channel. This parameter is dummy for unified policy. <**tcpPort**> TCP listen port for the connection to the service in server mode. Default 1024. Range 1..65535. This parameter is mandatory. <**tcpHostPort**> TCP remote port of the Host to connect to, in client mode. Default 1024. Range 1..65535. This parameter is mandatory. <**tcpHost**> IP address of the 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 This paramteter is mandatory. Default "".

#TCPATRUNCFG – Set TCP AT Run Service Parameters	
	<**urcmod**> 0 – disable unsolicited messages 1 – enale an unsolicitied message when the TCP socket is connected or disconnect (default). When unsolicited is enabled, an asynchronous TCP Socket connection is indicated to TE with unsolicited result code: **#TCPATRUN: <iphostaddress>** When unsolicited is enabled, the TCP socket disconnection is indicated to TE with unsolicited result code: **#TCPATRUN: <DISCONNECT>** Unsolicited is dumped on the instance that requested the service activation. **<timeout>** Define in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. The default value is 5 minutes. Range 1…5. **<authMode>** Determines the authentication procedure in server mode: 0 – when connection is up, username and password (in this order and each of them followed by a Carriage Return) have to be sent to the module before the first AT command. (default) 1 – when connection is up, the user receives a request for username and, if username is correct, a request for password. Then a message of “Login successful” will close authentication phase. Note: if username and/or password are not allowed (see **AT#TCPATRUNAUTH**) the connection will close immediately. Note: when <**authMode**> is set to 0 and the TCP AT Run service is running in Server mode by **#TCPATRUNL**, the following 4 commands using TCP AT RUN channel cannot be executed. - **AT#SMSATWL** - **AT#TCPATRUNFRWL** - **AT#FRWL** - **AT+CLCK** **<retryCnt>** in client mode, at boot or after a socket disconnection, this parameter represents the number of attempts that are made in order to re-connect to the Host. Default: 0. Range 0…5.

#TCPATRUNCFG – Set TCP AT Run Service Parameters	
	<retryDelay> in client mode, delay between one attempt and the other. In minutes. Default: 2. Range 1…3600. Note: the current settings are stored in NVM. Note: to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command). Note : the set command returns ERROR if the command **AT#TCPATRUNL**? returns 1 as <**mod**> parameter or the command **AT#TCPATRUND**? returns 1 as <**mod**> parameter
AT#TCPATRUNCFG?	Read command returns the current settings of parameters in the format: **#TCPATRUNCFG: <connId>,<instance>,<tcpPort>,<tcpHostPort>,<tcpHost>,<urcmod>,<timeout>,<authMode>,<retryCnt>,<retryDelay>**
AT#TCPATRUNCFG=?	Test command returns the supported values for the TCPATRUNCFG parameters.

5.6.3.5. TCP Run AT Service in listen (server) mode - #TCPATRUNL

#TCPATRUNL – Enables TCP AT Run Service in listen (server) mode	
AT#TCPATRUNL= <mod>	Set command enables/disables the TCP AT RUN service in server mode. When this service is enabled, the module tries to put itself in TCP listen state. Parameter: **<mod >** 0 – Service Disabled 1 – Service Enabled Note: the current settings are stored in NVM. Note: to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command). Note: while the TCP Run AT service executes a command that takes long time to get the response, a new command will be pending until the module has finished sending all of its response result code.
AT#TCPATRUNL?	Read command returns the current settings of <mode> and the value of <stat> in the format: **#TCPATRUNL: <mod>,<stat>** where: **<stat>** - connection status 0 – not in listen

#TCPATRUNL – Enables TCP AT Run Service in listen (server) mode	
	1 – in listen or active
AT#TCPATRUNL=?	Test command returns the supported values for the **TCPATRUNL** parameters

5.6.3.6. TCP AT Run Firewall List - #TCPATRUNFRWL

#TCPATRUNFRWL – TCP AT Run Firewall List	
AT#TCPATRUNFRWL= <action>, <ip_addr>, <net_mask>	Set command controls the internal firewall settings for the TCPATRUN connection. 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 tp 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 IP address mask in the format: xxx.xxx.xxx.xxx Command returns **OK** result code if successful. 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. Note: A maximum of 5 firewall can be present at same time in the List. Note: the firewall list is saved in NVM
AT#TCPATRUNFRWL?	Read command reports the list of all ACCEPT chain rules registered in the firewall setting in the format: **#TCPATRUNFRWL: <ip_addr>,<net_mask>** **#TCPATRUNFRWL: <ip_addr>,<net_mask>** **…**

#TCPATRUNFRWL – TCP AT Run Firewall List	
	OK
AT#TCPATRUNFRWL=?	Test command returns the allowed values for parameter <**action**>.

5.6.3.7. TCP AT Run Authentication Parameters List - #TCPATRUNAUTH

#TCPATRUNAUTH – TCP AT Run Authentication Parameters List	
AT#TCPATRUNAUTH=<action>,<userid>,<passw>	Execution command controls the authentication parameters for the TCPATRUN connection Parameters: **<action>** Command action 0 – remove selected chain 1 – add an **ACCEPT** chain 2 – remove all chains (**DROP** everything); <**userid** > and <**passw**> has no meaning in this case. <**userid**> User to be added into the **ACCEPT** chain; string type, maximum length 50 <**passw**> Password of the user on the <**userid**>; string type, maximum length 50 Command returns **OK** result code if successful. Note: A maximum of 3 entry (password and userid) can be present at same time in the List. Note: The Authentication Parameters List is saved in NVM.
AT#TCPATRUNAUTH?	Read command reports the list of all ACCEPT chain rules registered in the firewall setting in the format: **#TCPATRUNAUTH: <userid>,<passw>** **#TCPATRUNAUTH: <userid>,<passw>** **…** **OK**
AT#TCPATRUNAUTH=?	Test command returns the allowed values for parameter <**action**>.

5.6.3.8. TCP AT Run in dial (client) mode - #TCPATRUND

#TCPATRUND – Enable TCP AT Run Service in dial (client) mode	
AT#TCPATRUND=<mod>	Set command enables/disables the TCP AT RUN service in client mode. When this service is enabled, the module tries to open a connection to the Host (the Host is specified in **AT#TCPATRUNCFG**).

#TCPATRUND – Enable TCP AT Run Service in dial (client) mode	
	Parameter: **< mod >** 0: Service Disabled 1: Service Enabled Note: The current setting are stored in NVM Note: To start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command). Note: If the connection closes or at boot, if service is enabled and context is active, the module will try to reconnect for the number of attempts specified in AT#TCPATRUNCFG also the delay between one attempt and the other will be the one specified in **AT#TCPATRUNCFG**. Note: while the TCP Run AT service executes a command that takes long time to get the response, a new command will be pending until the module has finished sending all of its response result code.
AT#TCPATRUND?	Read command returns the current settings of <**mode**> and the value of <**stat**> in the format: **#TCPATRUND: <mod>,<stat>** where: **<stat>** - connection status 0 – not connected 1 – connected or connecting at socket level 2 – not connected but still trying to connect, attempting every delay time (specified in **AT#TCPATRUNCFG**)
AT#TCPATRUND =?	Test command returns the supported values for the **TCPATRUND** parameters

5.6.3.9. Closing TCP Run AT Socket - #TCPATRUNCLOSE

#TCPATRUNCLOSE – Closes TCP Run AT Socket	
AT#TCPATRUNCLOSE	Closes the socket used by TCP ATRUN service. Note: TCP ATRUN status is still enabled after this command, so the service re-starts automatically.
AT#TCPATRUNCLOSE=?	Test command returns **OK**

5.6.3.10. TCP AT Run Command Sequence - #TCPATCMDSEQ

#TCPATCMDSEQ – For TCP Run AT Service, allows the user to give AT commands in sequence	
AT#TCPATCMDSEQ= <mod>	Set command enable/dsable, for TCP Run AT service, a feature that allows giving more than one AT command without waiting for responses. It does not work with commands that uses the prompt '>' to receive the

#TCPATCMDSEQ – For TCP Run AT Service, allows the user to give AT commands in sequence	
	message body text (e.g. "**AT+CMGS**") Parameter: **< mod >** 0 - Service Disabled (default) 1 - Service Enabled
AT#TCPATCMDSEQ?	Read command returns the current settings of parameters in the format: **#TCPATCMDSEQ: <mod>**
AT#TCPATCMDSEQ=?	Test command returns the supported values for the **TCPATCMDSEQ** parameters.

5.6.3.11. TCP Run AT service to a serial port - #TCPATCONSER

#TCPATCONSER – Connects the TCP Run AT service to a serial port	
AT#TCPATCONSER= **<port>,** **<rate>**	Set command sets the TCP Run AT in transparent mode, in order to have direct access to the hardware port specified. Data will be transferred directly, without being elaborated, between the TCP Run AT service and the hardware port specified. If the CMUX protocol is running the command will return ERROR. Parameters: **< port >** 0 – UART Main Port 1 – Telit LTE USB Modem1 Port 2 – Telit LTE USB Modem2 Port Not all of these ports will be available at the same time. The port available will be displayed by the test command. <**rate**> Baud rate for data transfer. Allowed values are 300,1200,2400,4800,9600,19200,38400,57600,115200. Note: The command has to be issued from the TCP ATRUN instance Note: After this command has been issued, if no error has occurred, then a "**CONNECT**" will be returned by the module to advise that the TCP ATRUN instance is **in online mode** and connected to the port specified. Note: To exit from **online mode** and close the connection, the escape sequence (+++) has to be sent on the TCP ATRUN instance. The escape sequence needs to be sent in one single packet. The use of Telnet for Windows sending every single byte in a TCP packet is not appropriate to perform this connection.
AT#TCPATCONSER=?	Test command returns the supported values for the **TCPATCONSER** parameters

5.6.3.12. Run AT command execution - #ATRUNDELAY

#ATRUNDELAY – Set the delay on Run AT command execution	
AT#ATRUNDELAY= <srv>, <delay>	It has no effect and is included only for backward compatibility. Parameters: **< srv >** 0 – TCP Run AT service 1 – SMS Run AT service <**delay**> Value of the delay, in seconds. Range 0..30. Default value 0 for both services (TCP and SMS).
AT#ATRUNDELAY?	Read command returns the current settings of parameters in the format: **#ATRUNDELAY: 0, <delayTCP>** **#ATRUNDELAY: 1, <delaySMS>** **OK**
AT#ATRUNDELAY=?	Test command returns the supported values for the **ATRUNDELAY** parameters

5.6.4. Consume commands

5.6.4.1. Configure consume parameters - #CONSUMECFG

#CONSUMECFG – configure consume parameters	
AT#CONSUMECFG= <rule_id> [,<service_type> [,<rule_enable> [,<period> [,<limit_amount> [,<action_id>]]]]]	This command sets the parameters related to the consume functionality Parameters: **<rule_id>** Index of the rule to apply to a defined **<service_type>** Range: (0-10) The available rules are 10 and their identifier ranges from 1 to 10. The special case of **<rule_id>**=0 is explained below in a note. **<service_type>** Type of service to count: 0 – No service (default) 1 – SMS Sent 2 – SMS Received 3 – Total SMS 4 – CS MO Calls 5 – CS MT Calls 6 – Total CS Calls 7 – IP All Data Sent 8 – IP All Data Received 9 – IP All Data

#CONSUMECFG – configure consume parameters	
	10 – IP All Data Sent (with Header) 11 – IP All Data Received (with Header) 12 – IP All Data (with Header) **<rule_enable>** Enable the counter on the rule 0 – rule disabled (default) 1 – rule enabled **<period>** Time period over which the service type data are counted: 0 – life (entire module life) (default) 1 – 8760 (hours) **<limit_amount>** Limit amount of data to count. 0 is default value and means no set limit: in this case only the counter is active. 0 – 4294967295 KBytes, for **<service_type>**=7,8,9,10,11 and 12 0 – 65535 number of SMS, for **<service_type>**=1,2, and 3 0 – 65535 minutes, for **<service_type>**=4,5 and 6 **<action_id>** Identifier of the action to trigger when the threshold limit has been reached. It corresponds to the AT command associated to the event CONSUMEX, where X=1,…5. (Refer to **#EVMONI** command) Range: (0-5); 0 means no action associated: in this case only the counter is active. Note: the Set command **#CONSUMECFG=0** has a special behaviour: for all the enabled rules, the data and time of related counters are reset (if they are not-life counters) Note: the values set by command are directly stored in NVM Note: the life counters are disabled if <**enable**> parameter of **AT#ENACONSUME** is equal to 0 Note: a rule can be changed only setting **<rule_enable>**=0. The data and time of related counter are also reset (if it's not a life counter). Note: when the period expires, the counted data are reset, so the counting in the next period starts from 0. Note: if a service is blocked, then the related (life or not) counter is stopped also in terms of time (as well as in terms of data obviously).
AT#CONSUMECFG?	Read command returns the current settings for each rule in the format:

#CONSUMECFG – configure consume parameters	
	#CONSUMECFG: <rule_id>,<service_type>,<rule_enable>,<period>,<limit_amount>,<action_id>
AT#CONSUMECFG=?	Test command reports the supported range of values for all the parameters

5.6.4.2. Enable consume functionality - #ENACONSUME

#ENACONSUME – enable consume functionality	
AT#ENACONSUME= <enable> [,<storing_mode> [,<storing_period>]]	Set command enables/disables the consume functionality. Parameters: **<enable>** 0 – disable consume functionality (default) 1 – disable consume functionality except life counters 2 – enable consume functionality **<storing_mode>:** 0 – the counters are saved in NVM at every shuthdown (default) 1 – the counters are saved in NVM at every shuthdown and periodically at regular intervals specified by **<storing_period>** parameter **<storing_period>** - number of hours after that the counters are saved; numeric value in hours; range (0,8-24); 0 is default value and means no set period (as **<storing_mode>**=0) Note: the values set by command are directly stored in NVM Note: when the functionality is disabled with **<enable>**=0, the data counters are stopped but not reset: to reset them (except life counters) set **<rule_enable>**=0 with **AT#CONSUMECFG** command. Note: when the functionality is disabled with **<enable>**=1, the data counters are stopped except life counters. Note: the life counters are never reset, neither in terms of counted data nor in terms of time
AT#ENACONSUME?	Read command returns the current settings for all parameters in the format: **#ENACONSUME: <enable>,<storing_mode>,<storing_period>**
AT#ENACONSUME=?	Test command reports the supported range of values for all the parameters

5.6.4.3. Report consume statistics - #STATSCONSUME

#STATSCONSUME – report consume statistics	
AT#STATSCONSUME[= <counter_type>]	Execution command reports the values of the life counters for every type of service or the values of period counters for every rule. Parameter:

#STATSCONSUME – report consume statistics	
	<counter_type> Type of counter: range (0-1) 0 – period counter: the command returns the values of period counters for every rule defined with **AT#CONSUMECFG** command in the format: **#STATSCONSUME:** **<rule_1>,<service_type>,<counted_data>,<threshold>,<current_time>,<period><CR><LF>** **#STATSCONSUME:** **<rule_2>,<service_type>,<counted_data>,<threshold>,<current_time>,<period><CR><LF>….<CR><LF>>>** **#STATSCONSUME:** **<rule_10>,<service_type>,<counted_data>,<threshold>,<current_time>,<period>** where **<rule_i>** Index of the rule defined with **AT#CONSUMECFG** **<service_type>** Type of service: 1 – SMS Sent 2 – SMS Received 3 – Total SMS 4 – CS MO Calls 5 – CS MT Calls 6 – Total CS Calls 7 – IP All Data Sent 8 – IP All Data Received 9 – IP All Data 10 – IP All Data Sent (with Header) 11 – IP All Data Received (with Header) 12 – IP All Data (with Header) **<counted_data>** Number of data counted during **<current_time>** **<threshold>** Limit amount of data to count (set in parameter **<limit_amount>** with **AT#CONSUMECFG**) **<current_time>** Number of passed hours in the current **<period>** **<period>** Number of total hours in the period where the data are counted (corresponds to

#STATSCONSUME – report consume statistics	
	the value set in **<period>** with **AT#CONSUMECFG**) 1 – life counter: the command returns the values of life counters for every service type in the format: **#STATSCONSUME:** **<service_1>,<life_data>,<current_time><CR><LF>** **#STATSCONSUME:** **<service_2>,<life_data>,<current_time><CR><LF>…<CR><LF>** **#STATSCONSUME:** **<service_12>,<life_data>,<current_time>** where **<service_i>** is defined as **<service_type>** above **<life_data>** Number of data counted during entire life time period **<current_time>** Number of passed hours during entire life time period Note: issuing **AT#STATSCONSUME** without parameters has the same effect as **AT#STATSCONSUME**=0
AT#STATSCONSUME=?	Test command reports the supported range of value for **<counter_type>** parameter

5.6.4.4. Block/unblock a type of service - #BLOCKCONSUME

#BLOCKCONSUME – block/unblock a type of service	
AT#BLOCKCONSUME=<service_type>,<block>	Execution command blocks/unblocks a type of service Parameter: **<service_type>** Type of service: 1 – SMS Sending 2 – SMS Receiving 3 – SMS Sending/ Receiving 4 – CS MO Calls 5 – CS MT Calls 6 – MO/MT CS Calls 7 – IP Data **<block>** 0 – unblock the service specified in **<service_type>** 1 – block the service specified in **<service_type>** Note: even if the service “SMS Received” has been blocked, an SMS ATRUN can be received and managed.

#BLOCKCONSUME – block/unblock a type of service	
	Note: the type of service 7 “IP Data” comprises all the IP services (i.e. IP ,with or without header, sent, receive and sent/receive data)
AT#BLOCKCONSUME?	Read command reports the status blocked/unblocked of every type of service in the following format: **#BLOCKCONSUME: <service_type>,<block>**
AT#BLOCKCONSUME=?	Test command reports the supported range of values for **<service_type>** and **<block>** parameters

5.6.4.5. #SGACT#SSENDLINE configuration - #IPCONSUMECFG

#IPCONSUMECFG - #SGACT/#SSENDLINE configuration	
AT#IPCONSUMECFG= **[<connId>** **[,<txProt>** **[,<remoteHost>** **[,<remotePort>** **[,<authIMEI/ICCIDEna>** **[,<unused_A>** **[,<unused_B>** **[,<unused_C>** **]]]]]]]**	This command configures **#SGACT** authentication and **#SSENDLINE** connection parameters. Parameters: Following settings take effect on successive **#SSENDLINE** command: **<connId> -** socket connection identifier 1(default)..6 Note: verify **<connId>** is currently available(i.e: not already connected) by multisocket commands(**#SD**,**#SL**,…) before entering successive **#SSENDLINE** command **<txProt> -** transmission protocol 0 – TCP(default) 1 – UDP **<remoteHost> -** 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. Default “” **<remotePort> -** remote host port to contact 1..65535 Default 1024 Following setting takes effect on successive **#SGACT** command: **<authIMEI/ICCIDEna> -** enables PDP context activation (#SGACT) authentication(user/pwd) with ICCID/IMEI 0 – disable **#SGACT** authentication with IMEI/ICCID as user/pwd(default) 1 – enable **#SGACT** authentication with with IMEI/ICCID as user/pwd

#IPCONSUMECFG - #SGACT/#SSENDLINE configuration	
	Note: **<authIMEI/ICCIDEna>** setting takes effect when successive **#SGACT** not indicating **<userId>** and **<pwd>** will be used Note: the values set by command are directly stored in NVM and doesn't depend on the specific CMUX instance.
AT#IPCONSUMECFG?	Read command reports the currently configuration parameters in the format: #IPCONSUMECFG: <connId>,<txProt>,<remoteHost> ,<remotePort>,<authIMEI/ICCIDEna>,<0>,<0>,<0> <CR><LF>
AT#IPCONSUMECFG=?	Test command reports the supported range of values for all the parameters

5.6.4.6. Open a connection, send data, close connection - #SSENDLINE

#SSENDLINE – Open a connection,send data,close connection	
AT#SSENDLINE=<data>	This command permits to open a TCP/UDP connection, send specified data and close the TCP/UDP connection. The remote host/port of the connection have to be previously specified with **#IPCONSUMECFG** command. Parameters: **<data>** - text to send, shall be enclosed between double quotes. Note: maximum allowed amount of data is 380 octets Note: in case of UDP obviously only local opening/closure is done, datagram is sent with **<data>** contained in the payload.
AT#SSENDLINE=?	Test command reports the maximum length of <data> parameter

Example	at+cgdcont=1,"IP",”APN"
	OK
	
	at#ipconsumecfg=1,0,"remoteHost",remotePort
	OK
	// Socket with <connId> 1 will be used by #ssendline;
	// TCP will be the transmission protocol;
	// connection will be opened with “remoteHost”/remotePort
	
	at#sgact=1,1
	#SGACT: xxx.xxx.xxx.xxx

#SSENDLINE – Open a connection,send data,close connection	

	OK
	
	at#ssendline="test sample"
	// TCP connection with “remoteHost”/remotePort is opened ,
	// data between double quotes are sent,
	// then TCP connection is closed
	OK

5.6.5. Event Monitor Commands

5.6.5.1. Enable EvMoni Service - #ENAEVMONI

#ENAEVMONI – Enable EvMoni Service	
AT#ENAEVMONI= <mod>	Set command enables/disables the EvMoni service. Parameter: **<mod>** 0 – Service Disabled (default) 1 – Service Enabled Note: The current settings are stored in NVM. Note: while the Event Monitor service executes a command that takes long time to get the response, a new command will be pending until the module has finished sending all of its response result code.
AT#ENAEVMONI?	Read command returns the current settings of <mode> and the value of <stat> in the format: **#ENAEVMONI: <mod>,<stat>** where: **<stat>** - service status 0 – not active (default) 1 – active
AT#ENAEVMONI=?	Test command returns the supported values for the **ENAEVMONI** parameters

5.6.5.2. EvMoni Service parameter - #ENAEVMONICFG

#ENAEVMONICFG – Set EvMoni Service Parameters	
AT#ENAEVMONICFG= <instance> [,<urcmod> [,<timeout>]]	Set command configures the EvMoni service. Parameters: <**instance**> AT instance that will be used by the service to run the AT Command. Range 1-3. (Default: 3)

#ENAEVMONICFG – Set EvMoni Service Parameters	
	Note: In LE922A6, <**instance**> parameter is not supported and EvMoni service share the same channel with SMS Run AT service. This parameter is dummy for unified policy. **<urcmod>** 0 – disable unsolicited message 1 – enable an unsolicited message when an AT command is executed after an event is occurred (default) When unsolicited is enabled, the AT Command is indicated to TE with unsolicited result code: **#EVMONI: <TEXT>** e.g.: **#EVMONI: AT+CGMR;+CGSN;+GSN;+CCLK** Unsolicited is dumped on the instance that requested the service activation. <**timeout**> It defines in minutes the maximum time for a command execution. If timeout Expires the module will be rebooted. (Default: 5) Note: The current settings are stored in NVM. Note: EvMoni service and SMS Run AT service share the same channel. For the unified policy, when the **#ENAEVMONICFG** sets the <**instance**> parameter, the change is reflected also in the <**instance**> parameter of the **#SMSATRUNCFG** command, and viceversa. Note: The set command returns ERROR if the command **AT#ENAEVMONI?** Retirms 1 as <**mod**> parameter or the command **AT#SMSATRUN?** Returns 1 as <**mod**> parameter.
AT#ENAEVMONICFG?	Read command returns the current settings of parameters in the format: **#ENAEVMONICFG: <instance>,<urcmode>,<timeout>**
AT#ENAEVMONICFG=?	Test command returns the supported values for the **ENAEVMONICFG** parameters

5.6.5.3. Event Monitoring - #EVMONI

#EVMONI – Set the single Event Monitoring	
AT#EVMONI= **<label>** **,<mode>** **[,<paramType>** **,<param>]**	Set command enables/disables the single event monitoring, configures the related parameter and associates the AT command **<label>** String parameter (that has to be enclosed between double quotes) indicating

#EVMONI – Set the single Event Monitoring	
	the event under monitoring. It can assume the following values: • VBATT - battery voltage monitoring • DTR - DTR monitoring • ROAM - roaming monitoring • CONTDEACT - context deactivation monitoring • RING - call ringing monitoring • STARTUP – module start-up monitoring • REGISTERED – network registration monitoring • GPIO1 – monitoring on a selected GPIO in the GPIO range • GPIO2 – monitoring on a selected GPIO in the GPIO range • GPIO3 – monitoring on a selected GPIO in the GPIO range • GPIO4 – monitoring on a selected GPIO in the GPIO range • GPIO5 – monitoring on a selected GPIO in the GPIO range • ADCH1 – ADC High Voltage monitoring • ADCL1 – ADC Low Voltage monitoring • DTMF1 – monitoring on user defined DTMF string • DTMF2 – monitoring on user defined DTMF string • DTMF3 – monitoring on user defined DTMF string • DTMF4 – monitoring on user defined DTMF string • SMSIN – monitoring on incoming SMS • CONSUME1 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME2 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME3 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME4 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME5 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) **<mode>** 0 – disable the single event monitoring (default) 1 – enable the single event monitoring **< paramType >** Numeric parameter indicating the type of parameter contained in **<param>**. The 0 value indicates that **<param>** contains the AT command string to execute when the related event has occurred. Other values depend from the type of event. **<param>** It can be a numeric or string value depending on the value of **<paramType>** and on the type of event. If **<paramType>** is 0, then **<param>** is a string containing the AT command:

#EVMONI – Set the single Event Monitoring	
	• It has to be enclosed between double quotes • It has to start with the 2 chars AT (or at) • If the string contains the character ”, then it has to be replaced with the 3 characters \22 • the max string length is 96 characters • if it is an empty string, then the AT command is erased • If **<label>** is VBATT, **<paramType>** can assume values in the range 0 - 2. o if **<paramType>** = 1, **<param>** indicates the battery voltage threshold in the range 0 – 500, where one unit corresponds to 10 mV (therefore 500 corresponds to 5 V). (Default: 0) o if **<paramType>** = 2, **<param>** indicates the time interval in seconds after that the voltage battery under the value specified with **<paramType>** = 1 causes the event. The range is 0 – 255. (Default: 0) • If **<label>** is DTR, **<paramType>** can assume values in the range 0 - 2. o if **<paramType>** = 1, **<param>** indicates the status high or low under monitoring. The values are 0 (low) and 1 (high). (Default: 0) o if **<paramType>** = 2, **<param>** indicates the time interval in seconds after that the DTR in the status specified with **<paramType>** = 1 causes the event. The range is 0 – 255. (Default: 0) • If **<label>** is ROAM, **<paramType>** can assume only the value 0. The event under monitoring is the roaming state. • If **<label>** is CONTDEACT, **<paramType>** can assume only the value 0. The event under monitoring is the context deactivation. • If **<label>** is RING, **<paramType>** can assume values in the range 0 - 1. o if **<paramType>** = 1, **<param>** indicates the numbers of call rings after that the event occurs. The range is 1-50. (Default: 1) • If **<label>** is STARTUP, **<paramType>** can assume only the value 0. The event under monitoring is the module start-up. • If **<label>** is REGISTERED, **<paramType>** can assume only the value 0. The event under monitoring is the network registration (to home network or in roaming) after the start-up and the SMS ordening. • If **<label>** is GPIOX, **<paramType>** can assume values in the range 0 - 3. o if **<paramType>** = 1, **<param>** indicates the GPIO pin number; supported range is from 1 to a value that depends on the hardware. (Default: 1) o if **<paramType>** = 2, **<param>** indicates the status high or low under monitoring. The values are 0 (low) and 1 (high) . (Default: 0) o if **<paramType>** = 3, **<param>** indicates the time interval in seconds after that the selected GPIO pin in the status specified with **<paramType>** = 1 causes the event. The range is 0 – 255. (Default: 0) • If **<label>** is ADCH1, **<paramType>** can assume values in the range

#EVMONI – Set the single Event Monitoring	
	0 - 3. o if **<paramType>** = 1, **<param>** indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. (Default: 1) o if **<paramType>** = 2, **<param>** indicates the ADC High voltage threshold in the range 0 – 2000 mV. (Default: 0) o if **<paramType>** = 3, **<param>** indicates the time interval in seconds after that the selected ADC pin above the value specified with **<paramType>** = 1 causes the event. The range is 0 – 255. (Default: 0) • If **<label>** is ADCL1, **<paramType>** can assume values in the range 0 - 3. o if **<paramType>** = 1, **<param>** indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. (Default: 1) o if **<paramType>** = 2, **<param>** indicates the ADC Low voltage threshold in the range 0 – 2000 mV. (Default: 0) o if **<paramType>** = 3, **<param>** indicates the time interval in seconds after that the selected ADC pin under the value specified with **<paramType>** = 1 causes the event. The range is 0 – 255. (Default: 0) • If **<label>** is DTMFX, **<paramType>** can assume values in the range 0 - 2. o if **<paramType>** = 1, **<param>** indicates the DTMF string; the single DTMF characters have to belong to the range ((0-9),#,*,(A-D)); the maximum number of characters in the string is 15 o if **<paramType>** = 2, **<param>** indicates the timeout in milliseconds. It is the maximum time interval within which a DTMF tone must be detected after detecting the previous one, to be considered as belonging to the DTMF string. The range is (500 – 5000). (Default: 1000) • If **<label>** is SMSIN, **<paramType>** can assume values in the range 0 - 1. o if **<paramType>** = 1, **<param>** indicates the text that must be received in incoming SMS to trigger AT command execution rings after that the event occurs; the maximum number of characters in the SMS text string is 15 • If **<label>** is CONSUMEX, **<paramType>** can assume only the value 0. Note: the DTMF string monitoring is available only if the DTMF decode has been enabled (see **#DTMF** command)
AT#EVMONI?	Read command returns the current settings for each event in the format: **#EVMONI:** **<label>,<mode>,<param0>[,<param1>[,<param2>[,<param3>]]]**

#EVMONI – Set the single Event Monitoring	
	Where **<param0>,<param1>,<param2>** and **<param3>** are defined as before for <param> depending on <label> value
AT#EVMONI=?	Test command returns values supported as a compound value

5.6.5.4. Send Message - #CMGS

#CMGS - Send Message	
(PDU Mode) **AT#CMGS= <length>,<pdu>**	**(PDU Mode)** Execution command sends to the network a message. Parameter: **<length>** - length of the PDU to be sent in bytes (excluding the SMSC address octets). 7..164 **<pdu>** - PDU in 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 **+CSCA** is used; in this case the SMSC Type-of-Address octet shall not be present in the **<pdu>**. If message is successfully sent to the network, then the result is sent in the format: **#CMGS: <mr>** where **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format. Note: if message sending fails for some reason, an error code is reported.
(Text Mode) **AT#CMGS=<da> ,<text>**	**(Text Mode)** Execution command sends to the network a message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see **+CSCS**). **<text>** - text to send The entered text should be enclosed between double quotes and formatted as follows: - if current **<dcs>** (see **+CSMP**) indicates that GSM03.38 default alphabet is used and current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A.

#CMGS - Send Message	
	- if current **<dcs>** (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 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. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) If message is successfully sent to the network, then the result is sent in the format: **#CMGS: <mr>** where **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format. Note: if message sending fails for some reason, an error code is reported.
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.
Reference	3GPP TS 27.005

5.6.5.5. Write Message To Memory - #CMGW

#CMGW - Write Message To Memory	
(PDU Mode) **AT#CMGW= <length>,<pdu>**	**(PDU Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameter: **<length>** - length in bytes of the PDU to be written. 7..164 **<pdu>** - PDU in hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line. 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 **<memw>**. If message storing fails for some reason, an error code is reported.
(Text Mode)	**(Text Mode)**

#CMGW - Write Message To Memory	
AT#CMGW=<da> **,<text>**	Execution command writes in the **<memw>** memory storage a new message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see **+CSCS**). **<text>** - text to write The entered text should be enclosed between double quotes and formatted as follows: - if current **<dcs>** (see **+CSMP**) indicates that GSM03.38 default alphabet is used and current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. - if current **<dcs>** (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 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. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) 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 **<memw>**. If message storing fails for some reason, an error code is reported.
AT#CMGW=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.005
Note	To avoid malfunctions is suggested to wait for the **#CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

5.6.6. Multisocket AT Commands

5.6.6.1. Socket Status - #SS

#SS - Socket Status	
AT#SS[=<connId>]	Execution command reports the current status of the socket: **Parameters:** **<connId> - socket connection identifier** **1..6**

#SS - Socket Status	
	The response format is: **#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>** where: **<connId>** - socket connection identifier, as before **<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. 6 - Socket in opening process. The socket is not in closed state but still not in Active or Suspended or Suspended with pending data state. **<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. Note: issuing **#SS<CR>** causes getting information about status of all the sockets; the response format is: **#SS: <connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1>** **<CR><LF>** … **#SS: <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6>**
AT#SS=?	Test command reports the range for parameter **<connId>**.
Example	AT#SS #SS: 1,3,91.80.90.162,61119,88.37.127.146,10510 #SS: 2,4,91.80.90.162,1000 #SS: 3,0 #SS: 4,0 #SS: 5,3,91.80.73.70,61120,88.37.127.146,10509 #SS: 6,0 OK Socket 1: opened from local IP 91.80.90.162/local port 61119 to remote IP 88.37.127.146/remote port 10510 is suspended with pending data

#SS - Socket Status	
	Socket 2: listening on local IP 91.80.90.162/local port 1000 Socket 5: opened from local IP 91.80.73.70/local port 61120 to remote IP 88.37.127.146/remote port 10509 is suspended with pending data AT#SS=2 #SS: 2,4,91.80.90.162,1000 OK We have information only about socket number 2

5.6.6.2. 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: **<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 - Socket Info	
	#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

5.6.6.3. Socket Info Extended - #SIEXT

#SIEXT - Socket Info Extended	
AT#SIEXT[=<connId>]	Execution command is used to get information in terms of socket data traffic. Parameters: **<connId>** - socket connection identifier 1..6 The response format is: **#SIEXT: <connId>,<retx>,<oos>,<rsrvd1>,<rsrvd2>** where: **<connId>** - socket connection identifier, as before **<retx>** - total amount of retransmited outgoing packets since the last time the socket connection identified by **<connId>** has been opened **<oos>** - total amount of received out of sequence packets (packets whose sequence number is not matched with the next expected one) since the last time the socket connection identified by **<connId>** has been opened **<rsrvd1/2>** - reserved fields for future development of new statistics. Currently they're always equal to 0 Note: Parameters associated with a socket identified by <connId> are cleared when the socket itself is connected again (#SD or #SA after #SL). If previous connection has been established and closed, old values are still available before new connection is established. Note: Both **<retx>** and **<oos>** parameters are available only for TCP connections; their value is always 0 for UDP connections.

#SIEXT - Socket Info Extended	
	Note: Issuing **#SIEXT<CR>** causes getting information about data traffic of all the sockets; the response format is: **#SIEXT: <connId1>,<retx1>,<oos1>,<rsrvd1_1>,< rsrvd2_1>** **<CR><LF>** **…** **#SIEXT: <connId6>,<retx6>,<oos6>,< rsrvd1_6>,< rsrvd2_6>**
AT#SIEXT=?	Test command reports the range for parameter **<connId>**.
Example	AT#SIEXT #SIEXT: 1,3,10,0,0 #SIEXT: 2,0,100,0,0 #SIEXT: 3,0,0,0,0 #SIEXT: 4,0,0,0,0 #SIEXT: 5,0,0,0,0 #SIEXT: 6,0,0,0,0 OK Sockets 1 has retransmited 3 packets and received 10 out of sequence pacekts on its TCP connection. Socket 2 has just reeived 100 out of sequence packets without retransmission of packets on its TCP connection. Other socekts have not have retransmitted packet or received out of sequence packet on the last TCP connection. AT#SIEXT=1 #SIEXT: 1,3,10,0,0 OK We have information only for socket number 1

5.6.6.4. Socket Type- #ST

#ST – Socket Type	
AT#ST [=<connId>]	Set command reports the current type of the socket (TCP / UDP) and its direction (Dialer / Listener) Parameter: **<connId>** - socket connection identifier 1..6 The response format is: **#ST: <connId>,<type>,<direction>** where:

#ST – Socket Type	
	<connId> - socket connection identifier 1..6 **<type>** - socket type 0 – No socket 1 – TCP socket 2 – UDP socket **<direction>** - direction of the socket 0 – No 1 – Dialer 2 – Listener Note: issuing **#ST<CR>** causes getting information about type of all the sockets; the response format is: **#ST: <connId1>,<type1>,<direction1>** **<CR><LF>** **…** **#ST: <connId6>,<type6>,<direction6>**
AT#ST=?	Test command reports the range for parameter **<connId>**.
Example	Single socket: AT#ST=3 #ST:3,2,1 OK Socket 3 is an UDP dialer. All sockets: AT#ST #ST: 1,0,0 #ST: 2,0,0 #ST: 3,2,1 #ST: 4,2,2 #ST: 5,1,1 #ST: 6,1,2 OK Socket 1 is closed. Socket 2 is closed. Socket 3 is an UDP dialer. Socket 4 is an UDP listener. Socket 5 is a TCP dialer. Socket 6 is a TCP listener.

5.6.6.5. Context Activation - #SGACT

#SGACT - Context Activation	
AT#SGACT=<cid>,<stat>[,<userId>,<pwd>]	Execution command is used to activate or deactivate the specified PDP context. Parameters: **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) **<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 Execution command returns a list of IP addresses for the specified context identifiers in the format: If IP or IPV6 PDP context: **#SGACT: <ipAddr>** For DUAL STACK IPV4V6 PDP context: **#SGACT: [<ipAddrV4>],[<ipAddrV6>]** Where: **<ipAddr>** - ip address ipv4 or ipv6 **<ipAddrV4>** - ip address ipv4(if v4 PDP context activated) **<ipAddrV6>** - ip address ipv6(if v6 PDP context activated) Note: context activation/deactivation returns ERROR if there is not any socket associated to it (see AT#SCFG). Note: if the cid was activated already by +CGACT, Activation/ Deactivation with same cid returns error . **Note:** In LTE network, default PDP context(cid 1) is activated by piggybacking on LTE attach procedure and maintained until detached from NW. This command with cid 1 is just binding or unbinding application to the default PDP context.
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

#SGACT - Context Activation	
	1 - context activated
AT#SGACT=?	Reports the range for the parameters **<cid>** and **<stat>**

5.6.6.6. 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) and incoming connection mode. Trying to close an active socket connection produce a error and to close a closed socket or a listening socket produce **OK** response without any action.
AT#SH=?	Test command returns the **OK** result code.

5.6.6.7. Socket Configuration - #SCFG

#SCFG - Socket Configuration	
AT#SCFG= <connId>,<cid>, <pktSz>,<maxTo>, <connTo>,<txTo>	Set command sets the socket configuration parameters. Parameters: **<connId>** - socket connection identifier 1..6 **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) **<pktSz>** - packet size to be used by the TCP/UDP/IP stack for data sending. 0 - automatically chosen by the device(300). 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) 256 – set timeout value in 10 milliseconds 257 – set timeout value in 20 milliseconds 258 – set timeout value in 30 milliseconds

#SCFG - Socket Configuration	
	259 – set timeout value in 40 milliseconds 260 – set timeout value in 50 milliseconds 261 – set timeout value in 60 milliseconds 262 – set timeout value in 70 milliseconds 263 – set timeout value in 80 milliseconds 264 – set timeout value in 90 milliseconds Note: if DNS resolution is required, max DNS resolution time(20 sec) has to be considered in addition to **<connTo>** 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

5.6.6.8. Socket Configuration Extended - #SCFGEXT

#SCFGEXT - Socket Configuration Extended	
AT#SCFGEXT= **<connId>,** **<srMode>,** **<dataMode>,** **<keepalive>** **[,<ListenAutoRsp>** **[,<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>**

#SCFGEXT - Socket Configuration Extended	
	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 3 – Data view with UDP datagram informations: **SRING : <sourceIP>,<sourcePort><connId>,<recData>, <dataLeft>,<data>** same as before with <sourceIP>,<sourcePort> and <dataLeft> that means the number of bytes left in the UDP datagram **<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 **<ListenAutoRsp>** - Set the listen auto-response mode, that affects the commands AT#SL and AT#SLUDP 0 - Deactivated (default) 1 – Activated **<sendDataMode> -** data mode for sending data in command mode(AT#SSEND) 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 Note: for the behaviour of AT#SL and AT#SLUDP in case of auto-response mode or in case of no auto-response mode, see the description of the two commands.
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>, < ListenAutoRsp1>,0<CR><LF>** **...** **#SCFGEXT: <connId6>,<srMode6>,<dataMode6>,<keepalive6> < ListenAutoRsp6>,0**

#SCFGEXT - Socket Configuration Extended	
AT#SCFGEXT=?	Test command returns the range of supported values for all the subparameters
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. at#scfgext? #SCFGEXT: 1,2,0,30,0,0 #SCFGEXT: 2,0,0,0,0,0 #SCFGEXT: 3,1,1,0,0,0 #SCFGEXT: 4,0,0,0,0,0 #SCFGEXT: 5,0,0,0,0,0 #SCFGEXT: 6,0,0,0,0,0 OK

5.6.6.9. Socket Configuration Extended 2 - #SCFGEXT2

#SCFGEXT2 - Socket Configuration Extended	
AT#SCFGEXT2= <connId> [,<bufferStart> [,<abortConnAttempt> [, unused_B> [,<unused_C> [,<noCarrierMode>]]]]]	Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command. Parameters: **<connId>** - socket connection identifier 1..6 **<bufferStart>** - Set the sending timeout method based on new data received from the serial port. (<txTo> timeout value is set by #SCFG command) Restart of transmission timer will be done when new data are received from the serial port. 0 – old behaviour for transmission timer (#SCFG command 6th parameter old behaviour, start only first time if new data are received from the serial port) 1 – new behaviour for transmission timer : Restart when new data received from serial port Note : is necessary to avoid overlapping of the two methods. Enabling new method, the old method for transmission timer (#SCFG) is automatically disabled to avoid overlapping. Note : check if new data have been received from serial port is done with a granularity that is directly related to #SCFG <txTo> setting with a maximum period of 1 sec. <**abortConnAttempt**> - Enable connection attempt(#SD / #SKTD) abort before

#SCFGEXT2 - Socket Configuration Extended	
	CONNECT (online mode) or OK (command mode) 0 – Not possible to intterupt connection attempt 1 – It is possible to interrupt the connection attempt (<connTo> set by #SCFG or DNS resoultion running if required) And give back control to AT interface by reception of a character. As soon as the control has been given to the AT interface, the ERROR message will be received on the interface itself. Note : values are automatically saved in NVM. **<noCarrierMode>** - permits to choose **NO CARRIER** indication format when the socket is closed as follows 0 – **NO CARRIER** (default) Indication is sent as usual, without additional information 1 – **NO CARRIER:<connId>** Indication of current **<connId>** socket connection identifier is added 2 – **NO CARRIER:<connId>,<cause>** Indication of current **<connId>** socket connection identifier and closure **<cause>** are added For possible **<cause>** values, see also **#SLASTCLOSURE** Note: like **#SLASTCLOSURE**, in case of subsequent consecutive closure causes are received, the original disconnection cause is indicated. Note: in the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.
AT#SCFGEXT2?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT2: <connId1>,<bufferStart1>,<abortConnAttempt1>,0,0, <noCarrierMode> <CR><LF>** **...** **#SCFGEXT2: <connId6>,<bufferStart6>,<abortConnAttempt6>,0,0, <noCarrierMode6>**
AT#SCFGEXT2=?	Test command returns the range of supported values for all the subparameters

#SCFGEXT2 - Socket Configuration Extended	
Example	AT#SCFGEXT2=1,1 OK AT#SCFGEXT2=2,1 OK AT#SCFGEXT2? #SCFGEXT2: 1,1,0,0,0,0 #SCFGEXT2: 2,1,0,0,0,0 #SCFGEXT2: 3,0,0,0,0,0 #SCFGEXT2: 4,0,0,0,0,0 #SCFGEXT2: 5,0,0,0,0,0 #SCFGEXT2: 6,0,0,0,0,0 OK AT#SCFG? #SCFG: 1,1,300,90,600,50 #SCFG: 2,1,300,90,600,50 #SCFG: 3,1,300,90,600,50 #SCFG: 4,2,300,90,600,50 #SCFG: 5,2,300,90,600,50 #SCFG: 6,2,300,90,600,50 OK AT#SCFG=1,1,300,90,600,30 OK *Current configuration: socket with connId 1 and 2 are configured with new transmission timer behaviour.* *<txTo> corresponding value has been changed (#SCFG) for connId 1, for connId 2 has been left to default value.*

5.6.6.10. Socket configuration Extended 3 - #SCFGEXT3

#SCFGEXT3 - Socket Configuration Extended 3	
AT#SCFGEXT3=<connId >,<immRsp>[,<closureTypeCmdModeEnable>[,<fastsring>[,<unused_C>[,<unused_D>]]]]]	Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command nor in #SCFGEXT2 command Parameters: **<connId> -** socket connection identifier **1..6** **<immRsp> -** Enables AT#SD command mode immediate response 0 – factory default, means that AT#SD in command mode (see **AT#SD**) returns

#SCFGEXT3 - Socket Configuration Extended 3	
	after the socket is connected 1 – means that AT#SD in command mode returns immediately. Then the state of the connection can be read by the AT command **AT#SS** **<closureTypeCmdModeEnabling> -** Setting this parameter, successive #SD or #SL with <closureType> parameter 255 setting takes effect in command mode. It has been introduced due to retrocompatibility reason regarding <closureType> behaviour in command mode. 0 – factory default, #SD or #SL <closureType> 255 in command mode has no effect 1 – #SD or SL <closureType> 255 in command mode takes effect **<fastsring> -** Enables the fast SRING (active only when AT#SCFGEXT parameter <srmode>=2) in TCP and UDP sockets 0 – factory default, means that that SRING unsolicited is received periodically if data are available every 200ms. 1 –means that if data are available SRING unsolicited is received asynchronous as fast as possible. Note: parameter is saved in NVM
AT#SCFGEXT3?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT3:<connId1>,<immRsp1>,<closureTypeCmdModeEnable>,<fastsring>,0,0<CR><LF>** **. . .** **#SCFGEXT3:<connId6>,<immRsp6>,<closureTypeCmdModeEnable>,<fastsring>,0,0<CR><LF>**
AT#SCFGEXT3=?	Test command returns the range of supported values for all the parameters.

5.6.6.11. Socket Dial - #SD

#SD - Socket Dial	
AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>[,<closureType>[,<lPort>[,<connMode>[,<userIpType>]]]]	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 1..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 valid IPv6 address in the format: “xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx” or

#SD - Socket Dial	
	"xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query **<closureType>** - socket closure behaviour for TCP when remote host has closed 0 - local host closes immediately (default) 255 - local host closes after an #SH or immediately in case of an abortive disconnect from remote. **<lPort>** - UDP connections local port 1..65535 (factory default is 0) **<connMode>** - Connection mode 0 - online mode connection (default) 1 - command mode connection **<userIpType> -** in dual stack case the user can choose the socket type to open. According to this parameter DNS request will be sent. 0 – no ip type chosen;[default] 1 – ipv4. 2 – ipv6. **Note: <userIpType>** this parameter only valid when <ipaddr> is domain name and dual stack connection is open by (AT#SGACT). **Note: when <userIpType> is "no ip type chosen**" ipv6 will be requested firstly. When ipv6 DNS server doesn't support so ipv4 will be requested. 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 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

#SD - Socket Dial	
	send data while in **command mode** issuing **#SSEND** Note: **<closureType>** 255 takes effect on a command mode connection(**<connMode>** set to 1 or online mode connection suspended with +++) only if **#SCFGEXT3 <closureTypeCmdModeEnabling>** parameter has been previously enabled. Note: if PDP context has not properly opened through **#SGACT** (for instance: wrongly **+CGACT** command has been used), then +CME ERROR: 556(context not opened) will got
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

5.6.6.12. 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.

5.6.6.13. Socket Listen - #SL

#SL - Socket Listen	
AT#SL=<connId>, <listenState>, <listenPort> [,<closure type>]	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 1..65535

#SL - Socket Listen	
	<closure type> - socket closure behavior for TCP when remote host has closed 0 – local host closes immediately (default) 255 – local host closes after an #SH or immediately in case of an abortive disconnect from remote. Note: if successful, the command returns a final result code **OK**. If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when a TCP connection request comes on the input port, 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 ListenAutoRsp flag has been set, then, when a TCP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**. If the socket is closed by the network the following URC is received: **#SL: ABORTED** Note: when closing the listening socket <listenPort> is a don't care Parameter Note: **<closureType>** 255 takes effect on a command mode connection (connection accepted through AT#SA=<connId>,1 or online mode connection suspended with +++) only if **#SCFGEXT3 <closureTypeCmdModeEnabling>** parameter has been previously enabled.
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#SL=? #SL: (1-6),(0,1),(1-65535),(0,255) OK Next command opens a socket listening for TCP on port 3500. AT#SL=1,1,3500 OK

5.6.6.14. UDP SocketListen - #SLUDP

#SLUDP – UDP Socket Listen	
AT#SLUDP=	This command opens/closes a socket listening for an incoming UDP connection

#SLUDP – UDP Socket Listen	
<connId>, **<listenState>,** **<listenPort>**	on a specified port. Parameters: **<connId>** - socket connection identifier 1..6 **<listenState>** - 0 - closes socket listening 1 - starts socket listening **<listenPort>** - local listening port 1..65535 Note: if successful, the command returns a final result code OK. If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, 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 ListenAutoRsp flag has been set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**. If the socket is closed by the network the following URC is received: **#SLUDP: ABORTED** Note: when closing the listening socket <listenPort> is a don't care parameter
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	AT#SLUDP=? #SLUDP: (1-6),(0,1),(1-65535) OK Next command opens a socket listening on port 860 AT#SLUDP=1,1,860 OK SRING: 1 AT#SA=1

#SLUDP – UDP Socket Listen	
	OK CONNECT Test

5.6.6.15. 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 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.

5.6.6.16. Detect the cause of a Socket disconnection - #SLASTCLOSURE

#SLASTCLOSURE – Detect the cause of a socket disconnection	
AT#SLASTCLOSURE= [<connId>]	Execution command reports socket disconnection cause Parameters: **<connId> -** socket connection identifier 1..6 The response format is: **#SLASTCLOSURE: <connId>,<cause>** where: **<connId>** - socket connection identifier, as before **<cause>** - socket disconnection cause: 0 – not available(socket has not yet been closed) 1.- remote host TCP connection close due to FIN/END: normal remote disconnection decided by the remote application 2 -.remote host TCP connection close due to RST, all others cases in which the socket is aborted without indication from peer (for instance

#SLASTCLOSURE – Detect the cause of a socket disconnection	
	because peer doesn't send ack after maximum number of retransmissions/peer is no more alive). All these cases include all the "FATAL" errors after recv or send on the TCP socket(named as different from EWOULDBLOCK) 3.- socket inactivity timeout 4.- network deactivation(PDP context deactivation from network) Note: any time socket is re-opened, last disconnection cause is reset. Command report 0(not available). Note: user closure cause(**#SH**) is not considered and if a user closure is performed after remote disconnection, remote disconnection cause remains saved and is not overwritten. Note: if more consecutive closure causes are received, the original disconnection cause is saved. (For instance: if a TCP FIN is received from remote and later a TCP RST because we continue to send data, FIN cause is saved and not overwritten) Note: also in case of **<closureType>**(**#SD**) set to 255, if the socket has not yet been closed by user after the escape sequence, **#SLASTCLOSURE** indicates remote disconnection cause if it has been received. Note: in case of UDP, cause 2 indicates abnormal(local) disconnection. Cause 3 and 4 are still possible. (Cause 1 is obviously never possible) Note: in case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.
AT#SLASTCLOSURE=?	Test command reports the supported range for parameter **<connId>**

5.6.6.17. Receive Data In Command Mode - #SRECV

#SRECV – Received Data in Command Mode	
AT#SRECV=<connId>,<maxByte>[,<UDPInfo>]	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

#SRECV – Received Data in Command Mode	
	last **#SCFGEXT** setting. Parameters: **<connId>** - socket connection identifier 1..6 **<maxByte>** - max number of bytes to read 1..1500 **<UDPInfo>** 0 – UDP information disabled (default) 1 – UDP information enabled: data are read just until the end of the UDP datagram and the response carries information about the remote IP address and port and about the remaining bytes in the datagram. AT#SRECV=<connId>,<maxBytes>,1 #SRECV: <sourceIP>,<sourcePort><connId>,<recData>, <dataLeft> data Note: issuing **#SRECV** when there's no buffered data raises an error.
AT#SRECV=?	Test command returns the range of supported values for parameters **<connId> <maxByte>** and **<UDPInfo>**
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 Or: if the received datagram, received from <IPaddr and <IPport> is of 60 bytes AT#SRECV=1,15,1 #SRECV: <IPaddr>,<IPport>,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 – Received Data in Command Mode	
	#SRECV: 2,15 737472696e67612064692074657374 OK Or: if the received datagram, received from <IPaddr and <IPport> is of 60 bytes AT#SRECV=2,15 #SRECV: <IPaddr>,<IPport>,2,15 737472696e67612064692074657374 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

5.6.6.18. 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 bytes; trying to send more data will cause the surplus to be discarded and lost. 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)**
AT#SSEND=?	Test command returns the **OK** result code.
Example	Send data through socket number 2 AT#SSEND=2 >Test<CTRL-Z>

#SSEND – Send Data in Command Mode	
	OK

5.6.6.19. Send Data In Command Mode extended - #SSENDEXT

#SSENDEXT – 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 specifiying 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.

5.6.6.20. Send UDP data to a specific remote host - #SSENDUDP

#SSENDUDP – send UDP data to a specific remote host	
AT#SSENDUDP=<connId>,<remoteIP>,<r	This command permits, while the module is in command mode, to send data over UDP to a specific remote host.

#SSENDUDP – send UDP data to a specific remote host	
emotePort>	UDP connection has to be previously completed with a first remote host through **#SLUDP** / **#SA**. Then, if we receive data from this or another host, we are able to send data to it. Like command **#SSEND**, the device responds with '> ' and waits for the data to send. Parameters: **<connId>** - socket connection identifier 1..6 **<remoteIP>** - IP address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any valid IPv6 address in the format: "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" or "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" **<remotePort>** - remote host port 1..65535 Note: after SRING that indicates incoming UDP data and issuing **#SRECV** to receive data itself, through **#SS** is possible to check last remote host (IP/Port). Note: if successive resume of the socket to online mode Is performed(**#SO**), connection with first remote host is restored as it was before. Note: the maximum number of bytes to send is 1500 bytes
AT#SSENDUDP=?	Test command reports the supported range of values for parameters **<connId>**,**<remoteIP>** and **<remotePort>**
Example	Starts listening on <LocPort>(previous setting of firewall through #FRWL has to be done) AT#SLUDP=1,1,<LocPort> OK SRING: 1 // UDP data from a remote host available AT#SA=1,1 OK SRING: 1

#SSENDUDP – send UDP data to a specific remote host	
	AT#SI=1 #SI: 1,0,0,23,0 // 23 bytes to read OK AT#SRECV=1,23 #SRECV:1,23 message from first host OK AT#SS=1 #SS: 1,2,<LocIP>,<LocPort>,<RemIP1>,<RemPort1> OK AT#SSENDUDP=1,<RemIP1>,<RemPort1> >response to first host OK SRING: 1 // UDP data from a remote host available AT#SI=1 #SI: 1,22,23,24,0 // 24 bytes to read OK AT#SRECV=1,24 #SRECV:1,24 message from second host OK AT#SS=1 #SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2> OK Remote host has changed, we want to send a reponse: **AT#SSENDUDP=1,<RemIP2>,<RemPort2>** **>response to second host** **OK**

5.6.6.21. Send UDP data to a specific remote host extended - #SSENDUDPEXT

#SSENDUDPEXT – send UDP data to a specific remote host extended	
AT#SSENDUDPEXT =<connId>,<bytestosend>,<remoteIP>,<remotePort>	This command permits, while the module is in command mode, to send data over UDP to a specific remote host including all possible octets(from 0x00 to 0xFF) As indicated about **#SSENDUDP**: UDP socket has to be previously opened through **#SLUDP** / **#SA**, then we are able to send data to different remote hosts Like **#SSENDEXT**, the device responds with the prompt '> ' and waits for the data to send, operation is automatically completed when **<bytestosend>** have been sent. Parameters: **<connId>** - socket connection identifier 1..6 **<bytestosend>** - number of bytes to be sent 1-1500 **<remoteIP>** - IP address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any valid IPv6 address in the format: "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" or "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" **<remotePort>** - remote host port 1..65535
AT#SSENDUDPEXT =?	Test command reports the supported range of values for parameters **<connId>**,**<bytestosend>**,**<remoteIP>** and **<remotePort>**

5.6.6.22. IP Easy Authentication Type - #SGACTAUTH

#SGACTAUTH – Easy GPRS Authentication Type	
AT#SGACTAUTH= <type>	Set command sets the authentication type for Easy GPRS This command has effect on the authentication mode used on AT#SGACT or AT#GPRS commands. Parameter <type> 0 - no authentication 1 - PAP authentication (factory default) 2 - CHAP authentication Note: the parameter is not saved in NVM
AT#SGACTAUTH?	Read command reports the current Easy GPRS authentication type, in the format:

#SGACTAUTH – Easy GPRS Authentication Type	
	#SGACTAUTH: <type>
AT#SGACTAUTH=?	Test command returns the range of supported values for parameter **<type>.**

5.6.6.23. Context activation and configuration - #SGACTCFG

#SGACTCFG – Context Activation and Configuration	
AT#SGACTCFG= <cid>, <retry>, [,<delay> [,<urcmode>]]	Execution command is used to enable or disable the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every PS attach or after a **NW PDP CONTEXT deactivation** if al least one IPEasy socket is configured to this context (see AT#SCFG). Parameters: <**cid**> - PDP context identifier 1..5 – numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) <**retry**> - numeric parameter which specifies the maximum number of context activation attempts in case of activation failure. The value belongs to the following range: 0 – 15 0 – disable the automatic activation/reactivation of the context (default) <**delay**> - numeric parameter which specifies the delay in seconds between an attempt and the next one. The value belongs to the following range: 180 – 3600 <**urcmode**> - URC presentation mode 0 – disable unsolicited result code (default) 1 – enable unsolicited result code, after an automatic activation/reactivation, of the local IP address obtained from the network. It has meaning only if <**auto**>=1. The unsolicited message is in the format: **#SGACT: <ip_address>** Reporting the local IP address obtained from the network. Note: the URC presentation mode <**urcmode**> is related to the current AT instance only. Last <**urcmode**> setting is saved for every instance as extended profile parameter, thus it is possible to restore it even if the multiplexer control channel is released and set up, back and forth. Note: <**retry**> and <**delay**> setting aer global parameter saved in NVM. Note: if the automatic activation is enabled on a context, then it is not allowed to modify by the command AT#SCFG the association between the context itself and

#SGACTCFG – Context Activation and Configuration	
	the socket connection identifier all the other parameters of command AT#SCFG are modifiable while the socket is not connected.
AT#SGACTCFG?	Read command reports the state of all the 5 contexts, in the format: **#SGACTCFG: <cid1>,<retry1>,<delay1>,<urcmode><CR><LF>** **…** **#SGACTCFG: <cid5>,<retry5>,<delay5>,<urcmode>** where: <**cid*n***> - as <**cid**> before <**retry*n***> - as <**retry**> before <**delay*n***> - as <**delay**> before <**urcmode**> - as <**urcmode**> before
AT#SGACTCFG=?	Test command returns the range of supported values for parameters <**cid**>,<**retry**>,<**delay**> and <**urcmode**>

5.6.6.24. Context activation and configuration extended - #SGACTCFGEXT

#SGACTCFGEXT – Context Activation and Configuration Extended	
AT#SGACTCFGEXT= <cid>, <abortAttemptEnable>, [,<unused> [,<unused> [,<unused>]]]	Execution command is used to enable new features related to context activation. Parameters: <**cid**> - PDP context identifier 1..5 – numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) <**abortAttemptEnable**> 0 – old behavior: no abort possible while attempting context activation 1 – abort during context activation attempt is possible by sending a byte on the serial port. It takes effect on successive PDP context activation attempt through #SGACT command in the following manner. While waiting for AT#SGACT=<cid>,1 response (up to 150s), it is possible to abort attempt by sending a byte and get back AT interface control (NO CARRIER indication). Note: If we receive delayed CTXT ACTIVATION ACCEPT after abort, network will be automatically informed of our aborted attempt through relative protocol messages (SM STATUS) and will also close on its side. Ohterwise, if no ACCEPT is received after abort, network will be informed later of our PDP state through other protocol messages (routing area update for instance). Note: values are automatically saved in NVM.

#SGACTCFGEXT – Context Activation and Configuration Extended	
AT#SGACTCFGEXT?	Read command reports the state of all the 5 contexts, in the format: **#SGACTCFGEXT: <cid1>,<abortAttemptEnable1>,0,0,0<CR><LF>** **…** **#SGACTCFGEXT: <cid5>,<abortAttemptEnable5>,0,0,0** where: <**cid*n***> - as <**cid**> before <**abortAttemptEnable*n***> - as <**abortAttemptEnable**> before
AT#SGACTCFGEXT=?	Test command returns the range of supported values for parameters

5.6.6.25. Base64 encoding/decoding of socket sent/received data - #BASE64

#BASE64 – Base64 encoding/decoding of socket sent/received data	
AT#BASE64=<connId>,<enc>,<dec>[,<unused_B> [,<unused_C>]]	Set command enables base64 encoding and/or decoding of data sent/received to/from the socket in online or in command mode. Parameters: **<connId>** - socket connection identifier 1..6 **<enc>** 0 – no encoding of data received from serial port. 1 - MIME RFC2045 base64 encoding of data received from serial port that have to be sent to <connId> socket. Note: as indicated from RFC2045 the encoded output stream is represented in lines of no more than 76 characters each. Lines are defined as sequences of octets separated by a CRLF sequence. 2 - RFC 3548 base64 encoding of data received from serial port that have to be sent to <connId> socket. Note: as indicated from RFC3548 CRLF have not to be added. **<dec>** 0 – no decoding of data received from socket <connId>. 1 - MIME RFC2045 base64 decoding of data received from socket <connId> and sent to serial port. (Same rule as for <enc> regarding line feeds in the received file that has to be decoded) 2 - RFC3548 base64 decoding of data received from socket <connId> and sent to serial port. (Same rule as for <enc> regarding line feeds in the received file that has to be decoded)

#BASE64 – Base64 encoding/decoding of socket sent/received data	
	Note: it is possible to use command to change current <enc>/<dec> settings for a socket already opened in command mode or in online mode after suspending it. (In this last case obviously it is necessary to set AT#SKIPESC=1). Note: to use #BASE64 in command mode, if data to send exceed maximum value for #SSENDEXT command, they have to be divided in multiple parts. These parts have to be a multiple of 57 bytes, except for the last one, to distinguish EOF condition. (Base64 encoding rules) For the same reason if #SRECV command is used by the application to receive data, a multiple of 78 bytes has to be considered. Note: to use #SRECV to receive data with <dec> enabled, it is necessary to consider that: reading <maxByte> bytes from socket, user will get less due to decoding that is performed. Note: values are automatically saved in NVM.
AT#BASE64?	Read command returns the current <enc>/<dec> settings for all the six sockets, in the format: **#BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>** **. . .** **#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>**
AT#BASE64=?	Test command returns the range of supported values for all the subparameters.

Example	AT#SKIPESC=1
	OK
	
	AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>
	CONNECT
	//Data sent without modifications(default)
	……
	+++ (suspension)
	OK
	
	at#base64=<connId>,1,0
	OK
	
	AT#SO=<connId>
	CONNECT
	// Data received from serial port are encoded
	// base64 before to be sent on the socket

#BASE64 – Base64 encoding/decoding of socket sent/received data	

	……
	+++ (suspension)
	OK
	
	at#base64=<connId>,0,1
	OK
	
	AT#SO=<connId>
	CONNECT
	// Data received from socket are decoded
	// base64 before to be sent on the serial port
	+++ (suspension)
	……

5.6.7. SSL AT Commands

5.6.7.1. Configure general parameters of a SSL socket - #SSLCFG

#SSLCFG – Configure general parameters of a SSL socket	
AT#SSLCFG= **<SSId>,** **<cid>,** **<pktSz>,** **<maxTo>,** **<defTo>,** **<txTo>** **[,<sslSRINGMode>** **[,<noCarrierMode>** **[,<UNUSED_1>** **[,<UNUSED_2>]]]]**	This command allows configuration SSL connection parameters. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manages only one socket **<cid>** - PDP Context Identifier. Dummy. The PDP context used by SSL is specified in AT#PROTOCOLCFG(see) **<pktSz>** - packet size to be used by the SSL/TCP/IP stack for data sending. 0 – select automatically default value(300). 1..1500 – packet size in bytes. **<maxTo>** - exchange timeout(or socket inactivity timeout); in online mode, 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). **<defTo>** - Timeout that will be used by default whenever the corresponding parameter of each command is not set. 10..5000 – Timeout in tenth of seconds(default 100). **<txTo>** - data sending timeout; in online mode after this period data are sent also if they're less than max packet size. 0 – no timeout

#SSLCFG – Configure general parameters of a SSL socket	
	1..255 – timeout value in hundreds of milliseconds(default 50). <**sslSRINGMode**> -the presentation mode of the SSLSRING unsolicited indication, which informs the user about new incoming data that can be read in command mode. It can be disabled using value 0. 0 – SSLSRING disabled 1 – SSLSRING enabled in the format SSLSRING: <SSId>,<recData> Where <SSId> is the secure socket identifier and <recData> is the amout of data received and decoded by the SSL socket. A new unsolicited is sent whenever the amount of data ready to be read changes. Only a record is decoded at once so, any further record is received and decoded only after the first have been read by the user by means of the #SSLRECV command. 2 – SSLSRING enabled in the format SSLSRING: <SSId>,<dataLen>,<data> Where <SSId> is the secure socket identifier, <dataLen> is the length of the current chunk of data(the minimum value between the available bytes and 1300) and <data> is data received (<dataLen> bytes) displayed in ASCII format. **<noCarrierMode>** - this parameter permits to choose NO CARRIER indication format when the secure socket is closed as follows: 0 – NO CARRIER(default) indication is sent as usual, without additional information 1 – NO CARRIER:SSL,<SSId> indication of current <SSId> secure socket connection is added. The fixed "SSL" string allows the user to distinguish secure socket from TCP sockets. 2 – NO CARRIER:SSL,<SSId>,<cause> indication of current <SSId> secure socket connection and closure <cause> are added. Following the possible <cause> values are listed: 0 – not available(secure socket has not yet been closed) 1 – the remote TCP connection has been closed(RST, or any fatal error in send/recv are all included within this case) 2 – socket inactivity timeout 3 – network deactivation(PDP context deactivation from network) 4 – SSL "Close Notify Alert" message has been received 5 – the remote TCP connection has been closed(FIN) after all data have been retrieved from socket. 6 – Closure due to any other SSL alert different from the previous ones. Note: if secure socket is not enabled using #SSLEN only test requests can be made. Read command can be issued if at least a <SSId> is enabled. Note: these parameters cannot be changed if the secure socket is connected. Note: these values are automatically saved in NVM.
AT#SSLCFG?	Read command reports the currently selected parameters in the format:

#SSLCFG – Configure general parameters of a SSL socket	
	#SSLCFG: <SSId1>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>,<sslSRINGMode>,<noCarrierMode>,0,0
AT#SSLCFG=?	Test command returns the range of supported values for all the parameters. **#SSLCFG:(1),(1-5),(0-1500),(0-65535),(10-5000),(0-255),(0-2),(0-2),(0),(0)**

5.6.7.2. Opening a socket SSL to a remote server #SSLD

#SSLD – Opening a socket SSL to a remote server	
AT#SSLD= <SSId>, <rPort>, <IPAddress>, <ClosureType> [,<connMode> [,<Timeout>]]	Execution command opens a remote connection via socket secured through SSL. Both command and online modes can be used. In the first case '**OK**' is printed on success, and data exchange can be performed by means of **#SSLSEND** and **#SSLRECV** commands. In online mode '**CONNECT**' message is printed, and data can be sent/received directly to/by the serial port. Communication can be suspended by issuing the escape sequence(by default +++) and restored with **#SSLO** command. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket **<rPort>** - Remote TCP port to contact 1..65535 **<IPAddress>** - string type, address of SSL server **<ClosureType>** - how to close SSL socket 0 – only value 0 is supported **<connMode>** - connection mode 0 – online mode connection 1 – command mode connection(factory default). **<Timeout>** - time-out in 100 ms units. It represents the TCP inter-packet delay. Note: it **DOES NOT** represent the total handshake timeout. 10..5000 – hundreds of ms(factory default is 100) Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used. Note: in online mode the socket is closed after an inactivity period(configurable with

#SSLD – Opening a socket SSL to a remote server	
	#SSLCFG, with a default value of 90 seconds), and the '**NO CARRIER**' message is printed. Note: Before opening a SSL connection the PDP context must have been activated by AT#SGACT=x,1. Note: in online mode data are transmitted as soon as the data packet size is reached or as after a transmission timeout. Both these parameters are configurable by using **#SSLCFG**. Note: Before opening a SSL connection, make sure to have stored the needed secure data(CA certificate), using **AT#SSLSECDATA**.
AT#SSLD=?	Test command returns the range of supported values for all the parameters: **#SSLD: (1),(1-65535),,(0),(0,1),(10-5000)**

5.6.7.3. Enabling a SSL socket - #SSLEN

#SSLEN - Enabling a SSL socket	
AT#SSLEN= <SSId>, <Enable>	This command enables a socket secured by SSL Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manages only one socket **<Enable>** 0 – deactivate secure socket [default] 1 – activate secure socket Note: if secure socket is not enabled only test requests can be made for every SSL command except #SSLS(SSL Status) which can be issued also if the socket is disabled. Read commands can be issued if at least a <SSId> is enabled. Note: these values are automatically saved in NVM. Note: an error is raised if #SSLEN=X,1 is issued when the socket 'X' is already enabled and if #SSLEN=X,0 is issued when the socket 'X' is already disabled. Note: a SSL socket cannot be disabled by issuing #SSLEN=1 if it is connected.
AT#SSLEN?	Read command reports the currently enable status of secure socket in the format: **#SSLEN: <SSId>,<Enable><CR><LF> <CR><LF>**

#SSLEN - Enabling a SSL socket	
	OK
AT#SSLEN=?	Test command returns the range of supported values for all the parameters: **#SSLEN: (1),(0,1)**

5.6.7.4. Closing a SSL socket - #SSLH

#SSLH – Closing a SSL socket	
AT#SSLH= **<SSId>** **[,<ClosureType>]**	This command allows closing the SSL connection. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manager only one socket. **<ClosureType>** - how to close SSL socket 0 – only value 0 is supported Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made.
AT#SSLH=?	Test command returns the range of supported values for all the parameters: **#SSLH: (1),(0)**

5.6.7.5. Secure socket Info - #SSLI

#SSLI – Secure Socket Info	
AT#SSLI[=<SSId>]	Execution command is used to get information about secure socket data traffic. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manages only one socket The response format is: **#SSLI:** **<SSId>,<DataSent>,<DataRecv>,<PendingData>,<TCPConnWaitingAck>** where: **<SSId>** - secure socket connection identifier, as before **<DataSent>** - total amount(in bytes) of data sent to the TLS/SSL connection since the beginning of the connection itself

#SSLI – Secure Socket Info	
	(obviously: not yet encoded into TLS/SSL record) **<DataRecv> -** total number of bytes received from the TLS/SSL connection since the beginning of the connection itself (obviously: already decoded from TLS/SSL record) **<PendingData> -** number of bytes available to be read from the TLS/SSL record that is currently being processed (obviously: already decoded from TLS/SSL record) **<TCPConnWaitingAck> -** indication of the underlying TCP socket condition, if there are TCP/IP packets sent but not yet acknowledged or not 0 – no TCP/IP packets sent waiting for ack 1 – yes TCP/IP packets sent waiting for ack
AT#SSLI=?	Test command returns the range of supported values for all the parameters. #SSLI: (1)

5.6.7.6. Restoring a SSL socket after a +++ - #SSLO

#SSLO – Restoring a SSL socket after a +++	
AT#SSLO= <SSId>	This command allows to restore a SSL connection(online mode) suspended by an escape sequence(+++). After the connection restore, the **CONNECT** message is printed. Please note that this is possible even if the connection has been started in command mode(#SSLD with <connMode> parameter set to 1). Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if an error occur during reconnection the socket can not be reconnected then a new connection has to be done.
AT#SSLO=?	Test command returns the range of supported values for all the parameters: **#SSLO: (1)**

5.6.7.7. Reading data from a SSL socket - #SSLRECV

#SSLRECV – Reading data from a SSL socket	
AT#SSLRECV= <SSId>, <MaxNumByte> [,<TimeOut>]	This command allows receiving data from a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket **<MaxNumByte>** - max number of bytes to read 1..1000 **<Timeout>** - time-out in 100 ms units 1..5000 – hundreds of ms(factory default is 100) If no data are received the device respondes: **#SSLRECV: 0<CR><LF>** **TIMEOUT<CR><LF>** **<CR><LF>** **OK** If the remote host closes the connection the device respondes: **#SSLRECV: 0<CR><LF>** **DISCONNECTED<CR><LF>** **<CR><LF>** **OK** If data are received the device respondes: **#SSLRECV: NumByteRead<CR><LF>** **…(Data read)…<CR><LF>** **<CR><LF>** **OK** Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set through **AT#SSLCFG**, is used. Note: before receiving data from the SSL connection it has to be established using **AT#SSLD**.
AT#SSLRECV=?	Test command returns the range of supported values for all the parameters: **#SSLRECV: (1),(1-1000),(1-5000)**

5.6.7.8. Reporting the status of a SSL socket - #SSLS

#SSLS – Reporting the status of a SSL socket	
AT#SSLS= **<SSId>**	This command reports the status of secure sockets. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manages only one socket If secure socket is connected, the device responds to the command: **#SSLS:<SSId>,2,<CipherSuite>** < **CipherSuite** > available values are: 0 – unknown 1 – TLS_RSA_WITH_RC4_128_MD5(Not supported, Dummy) 2 – TLS_RSA_WITH_RC4_128_SHA(Not supported, Dummy) 3 – TLS_RSA_WITH_AES_128_CBC_SHA 4 – TLS_RSA_WITH_NULL_MD5(Not supported, Dummy) 5 – TLS_RSA_WITH_AES_256_CBC_SHA (Not supported, Dummy) Otherwise: **#SSLS: <SSId>,<ConnectionStatus>** **<ConnectionStatus>** available values are: 0 – Socket Disabled 1 – Connection closed 2 – Connection open Note: this command can be issued even if the <SSId> is not enabled.
AT#SSLS=?	Test command returns the range of supported values for all the parameters. **#SSLS: (1)**

5.6.7.9. Managing the security data - #SSLSECDATA

#SSLSECDATA – Managing the security data	
AT#SSLSECDATA= **<SSId>,** **<Action>,** **<DataType>** **[,<Size>]**	This command allows to store, delete and read security data(Certificate, CACertificate, Private key) into NVM. Parmaters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manages only one socket.

#SSLSECDATA – Managing the security data	
	<Action> - Action to do. 0 – Delete data from NVM 1 – Store data into NVM 2 – Read data from NVM **<DataType>** 0 – Certificate 1 – CA Certificate 2 – RSA Private key **<Size>** - Size of security data to be stored 1..4000 If the <Action> parameter si 1(store data into NVM) the device responds to the command with the prompt '>' and waits for the data to store. 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 stored, then the response is OK; if it fails for some reason, an error code is reported. If the <Action> parameter is 2(read data from NVM), data specified by <DataType> parameter is shown in the following format: **#SSLSECDATA: <connId>,<DataType>** **<DATA>** **OK** If <DataType> data has not been stored (or it has been delete) the response has the following format: **#SSLSECDATA: <connId>,<DataType>** **No data sotred** **OK** Note: Private keys with password ARE NOT supported. Note: <size> parameter is mandatory if the <write> action is issued, but it has to be omitted for <delete> or <read> actions are issued. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: If socket is connected an error code is reported.

#SSLSECDATA – Managing the security data	
	Note: in case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid #SSLSECDATA command.
AT#SSLSECDATA?	Read command reports what security data are stored in the format: **#SSLSECDATA: <SSId1>,<CertIsSet>,<CAcertIsSet>,<PrivKeyIsSet>** <CertIsSet>, <CAcertIsSet>, <PrivKeyIsSet> are 1 if related data are stored into NVM otherwise 0.
AT#SSLSECDATA=?	Test command returns the range of supported values for all the parameters: #SSLSECDATA: (1),(0-2),(0-2),(1-4000)

5.6.7.10. Sending data through a SSL socket - #SSLSEND

#SSLSEND – Sending data through a SSL socket	
AT#SSLSEND= <SSId> [,<Timeout>]	This command allows sending data throught a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket. **<Timeout>** - socket send timeout, in 100 ms units 1..5000 – hundreds of ms(factory default is 100) 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 the surplus to be discarded and lost. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used. Note: Before sending data through the SSL connection it has to be established using **AT#SSLD**. Note: all special characters are not sent like a general byte.

#SSLSEND – Sending data through a SSL socket	
	(For instance: 0x08 is not sent and behave like a BS, i.e. previous character is deleted)
AT#SSLSEND=?	Test command returns the range of supported values for all the parameters: **#SSLSEND: (1),(1-5000)**

5.6.7.11. Sending data through a secure socket in Command Mode extended - #SSLSENDEXT

#SSLSENDEXT – Sending data through a secure socket in Command Mode extended	
AT#SSLSENDEXT= <SSId>, <bytestosend> [,<Timeout>]	This command allows sending data through a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. **<bytestosend>** - number of bytes to be sent Please refer to test command for range **<Timeout>** - time-out in 100 ms units 1..5000 - hundreds of ms (factory default is 100) 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: if secure socket is not enabled using AT#SSLEN only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set by AT#SSLCFG, is used. Note: Before sending data through the SSL connection it has to be established using AT#SSLD. 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#SSLSENDEXT=?	Test command returns the range of supported values for parameters <SSId> , <bytestosend> and <Timeout>. **#SSLSENDEXT: (1),(1-1500),(1-5000)**

5.6.7.12. Configure security parameters of a SSL socket - #SSLSECCFG

#SSLSECCFG – Configure security parameters of a SSL socket	
AT#SSLSECCFG= <SSId>, <CipherSuite>, <auth_mode> [,<cert_format>]	This command allows configuring SSL connection parameters. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket **<CipherSuite>** 0 - Chiper Suite is chosen by remote Server [default] 1 - TLS_RSA_WITH_RC4_128_MD5(Not supported) 2 - TLS_RSA_WITH_RC4_128_SHA(Not supported) 3 - TLS_RSA_WITH_AES_128_CBC_SHA 4 - TLS_RSA_WITH_NULL_SHA(Not supported) 5 - TLS_RSA_WITH_AES_256_CBC_SHA(Not supported) **<auth_mode>** 0 – SSL Verify None[default] 1 – Manage server authentication 2 – Server/Client authentication: CA Certificate(server), Certificate(client) and Private Key(client) are needed **<cert_format>** is an optional parameter. It selects the format of the certificate to be stored via **#SSLSECDATA** command 0 - DER format 1 - PEM format[default] Note - it is supposed that the module is just powered on and the **AT#SSLSECCFG** command is entered without **<cert_format>** parameter, the default format is PEM. In this case the **AT#SSLSECCFG?** read command doesn't return the setting of the format in order to meet retro compatibility with other families. Now, let's assume that **AT#SSLSECCFG** command is entered again, but using the **<cert_format>** parameter for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the **<cert_format>** is omitted, the **AT#SSLSECCFG?** read command reports the parameter value entered the last time. Note: Server CAcertificate has to be stored through **AT#SSLSECDATA**. Note: if secure socket is not enabled using **#SSLEN** only test requests can be made. Read command can be issued if at least a **<SSId>** is enabled. Note: these values are automatically saved in NVM.
AT#SSLSECCFG?	Read command reports the currently selected parameters in the format:

#SSLSECCFG – Configure security parameters of a SSL socket	
	#SSLSECCFG: <SSId1>,<CipherSuite>,<auth_mode>[,<cert_format>]
AT#SSLSECCFG=?	Test command returns the range of supported values for all the parameters.

5.6.7.13. Configure additional parameters of a SSL socket - #SSLSECCFG2

#SSLSECCFG2 – Configure additional parameters of a SSL socket	
AT#SSLSECCFG2= <SSId>, <version>, [<unused_A> [,<unused_B> [,<unused_C> [,<unused_D>]]]]	This command allows configuring SSL connection parameters. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket **<version>** - SSL/TLS protocol version [default is 1, i.e.: TLSv1.0] 0 – protocol version SSLv3(Not supported) 1 – protocol version TLSv1.0 2 – protocol version TLSv1.1 Note: parameter is automatically saved in NVM.
AT#SSLSECCFG2?	Read command reports the currently selected parameters in the format: **#SSLSECCFG2: <SSId1>,<version>,0,0,0,0**
AT#SSLSECCFG2=?	Test command returns the range of supported values for all the parameters.

5.6.8. FTP AT Commands

5.6.8.1. 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>**

5.6.8.2. FTP Open - #FTPOPEN

#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), in the format: "ipv4" / "ipv4:port" "ipv6" / "[ipv6]" / "[ipv6]:port" "dynamic_name" / "dynamic_name:port" **<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 : In FTP Open case, the solution dependency limits the maximum time out to 1200 (120 seconds). The FTPTO value that exceed 1200 is considered as 1200. Note: Before opening FTP connection the PDP context must been activated with AT#GPRS=1 or AT#SGACT
AT#FTPOPEN=?	Test command returns the **OK** result code.

5.6.8.3. FTP Close - #FTPCLOSE

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

5.6.8.4. FTP Config - #FTPCFG

#FTPCFG – FTP Config	
AT#FTPCFG= **<tout>,** **<IPPignoring>** **[,<FTPSEn>** **[,<FTPext>]]**	**<tout>** - time-out in 100 ms units 100..5000 – hundreds of ms (factory default is 100) Set command set the time-out used when opening either the FTP control channel or the FTP traffic channel. s Note: The parameter is not saved in NVM. Note: if parameter **<tout>** is omitted the behavior of Set command is the same as Read command. **<IPPignoring>** 0: No IP Private ignoring. During a FTP passive mode connection client uses the IP address received from server, even if it is a private IPV4 address. 1: IP Private ignoring enabled. During a FTP passive mode connection if the server sends a private IPV4 address the client doesn't consider this and connects with server using the IP address used in AT#FTPOPEN.

#FTPCFG – FTP Config	
	<FTPSEn> 0: – Disable FTPS security: all FTP commands will perform plain FTP connections. **<FTPext>** 0 – always use EPRT and EPSV commands(default) 1 – if both module and server ipv4 use PORT and PASV commands Option added to pass-through firewall that is unaware of the extended FTP commands for FTPPUT, FTPLIST, FTPAPP, FTPGET
AT#FTPCFG?	Read command reports the currently selected parameters in the format: **AT#FTPCFG=<tout>,<IPPignoring>,<FTPSEn>,<FTPext>**
AT#FTPCFG=?	Test command reports the sypported range of values for parameter(s) **<tout>,<IPPignoring>,<FTPSEn>,<FTPext>**

5.6.8.5. FTP Put - #FTPPUT

#FTPPUT - FTP Put	
AT#FTPPUT= **[[<filename>]** **[,<connMode>]]**	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. Note: if we set **<connMode>** to 1, the data connection is opened and we remain in command mode and we see the result code **OK** (instead of **CONNECT**) Parameter: **<filename>** - string type, name of the file (maximum length 200 characters) **<connMode>** 0 – online mode 1 – command mode 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.
AT#FTPPUT=?	Test command reports the maximum length of <**filename**> and the supported range of values of <**connMode**>. The format is: **#FTPPUT:<length>,(list of supported <connMode>s)** where: **<length>** - integer type value indicating the maximum length of <**filename**>

5.6.8.6. FTP Get - #FTPGET

#FTPGET - FTP Get

#FTPGET - FTP Get	
AT#FTPGET=[<filename>]	Execution command, issued during an FTP connection, opens a data connection and 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.

5.6.8.7. FTP GET in command mode - #FTPGETPKT

#FTPGETPKT - FTP Get in command mode	
AT#FTPGETPKT=<filename>[,<viewMode>]	Execution command issued during an FTP connection, opens a data connection and starts getting a file from the FTP server while remaining in **command mode**. The data port is opened and we remain in **command mode** and we see the result code **OK**. Retrieval from FTP server of "remotefile" is started, but data are only buffered in the module. It's possible to read data afterwards issuing **#FTPRECV** command. Parameter: **<filename>** - file name, string type. (maximum length: 200 characters). <viewMode> - permit to choose view mode (text format or Hexadecimal) 0 – text format (default) 1 – hexadecimal format Note: The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet. Note: Command closure should always be handled by application. In order to avoid download stall situations a timeout should be implemented by the application.
AT#FTPGETPKT?	Read command reports current download state for <filename> with <viewMode> chosen, in the format: **#FTPGETPKT**: <**remotefile**>,<**viewMode**>,<**eof**> <**eof**> 0 – file currently being transferred 1 – complete file has been transferred to FTP client
AT#FTPGETPKT=?	Test command returns the **OK** result code.

5.6.8.8. FTP Type - #FTPTYPE

#FTPTYPE - FTP Type

#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.
#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)**

5.6.8.9. 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.

5.6.8.10. 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. 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.

5.6.8.11. 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.

5.6.8.12. FTP Change Working Directory - #FTPCWD

#FTPCWD - FTP Change Working Directory	
AT#FTPCWD=	Execution command, issued during an FTP connection, changes the working

#FTPCWD - FTP Change Working Directory	
[<dirname>]	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.

5.6.8.13. 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.

5.6.8.14. Get file size - #FTPFSIZE

#FTPFSIZE – Get file size from FTP server	
AT#FTPFSIZE= <filename>	Execution command, issued during an FTP connection, permits to get file size of <**filename**> file. Note: **#FTPTYPE=0** command has to be issued before **#FTPFSIZE** command, to set file transfer type to binary mode.
AT#FTPFSIZE=?	Test command returns the **OK** result code.

5.6.8.15. FTP Append - #FTPAPP

#FTPAPP – FTP Append	
AT#FTPAPP= [<filename> [,<connMode>]]	Execution command, issued during an FTP connection, opens a data connection and append data to existing <**filename**> file. If the data connection succedds, a **CONNECT** indication is sent, Afterward a **NO CARRIER** indication is sent when the socket is closed. Note: if we set <**connMode**> to 1, the data connection is opened and we remain in **command mode** and we see the result code **OK** (instead of **CONNECT**)

#FTPAPP – FTP Append	
	Parameters: **<filename>** – string type, name of the file. <**connMode**> 0 – online mode 1 – command mode 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.
AT#FTPAPP=?	Test command reports the maximum length of <**filename**> and the supported range of values of <**connMode**>. The format is: **#FTPAPP:<length>,(list of supported <connMode>s)** where: <**length**> – integer type value indicating the maximum length of <**filename**>

5.6.8.16. Set restart position - #FTPREST

#FTPREST – Set restart position for FTP GET	
AT#FTPREST= <restartposition>	Set command sets the restart position for successive **#FTPGET** (or **#FTPGETPKT**) command. It permits to restart a previously interrupted FTP download from the selected position in byte. Parameters: <**restartposition**> – position in byte of restarting for successive **#FTPGET** (or **#FTPGETPKT**) Note: It's necessary to issue **#FTPTYPE=0** before successive **#FTPGET** (or **#FTPGETPKT**) to set binary file transfer type. Note: Setting <**restartposition**> has effect on successive FTP download. After successive successfully initiated **#FTPGET** (or **#FTPGETPKT**) command, <**restartposition**> is automatically reset. Note: value set for <**restartposition**> has effect on next data transfer (data port opened by **#FTPGET** or **#FTPGETPKT**). Then <**restartposition**> value is automatically assigned to 0 for next download.
AT#FTPREST?	Read command returns the current <restartposition> **#FTPREST:<restartposition>**
AT#FTPREST=?	Test command returns the OK result code.

5.6.8.17. Receive Data In Command Mode - #FTPRECV

#FTPRECV – Receive Data In Command Mode	
AT#FTPRECV= <blocksize>	Execution command permits the user to transfer at most <**blocksize**> bytes of remote file, provided that retrieving from the FTP server has been started with a previous **#FTPGETPKT** command, onto the serial port. This number is limited to the current number of bytes of the remote file which have been transferred from the FTP server. Parameter: <**blocksize**> – max number of bytes to read 1..3000 Note: it's necessary to have previously opened FTP data port and started download and buffering of remote file through **#FTPGETPKT** command. Note: issuing **#FTPRECV** when there's no FTP data port opened raises an error. Note: data port will stay opened if socket is temporary waiting to receive data (**FTPRECV** returns 0 and **FTPGETPKT** gives a EOF 0 indication).
AT#FTPRECV?	Read command reports the number of bytes currently received from FTP server, in the format: **#FTPRECV:<available>**
AT#FTPRECV=?	Test command returns the range of supported values for <blocksize> parameter.
Example	AT#FTPRECV? #FTPRECV: 3000 OK *Read required part of the buffered data:* AT#FTPRECV=400 #FTPRECV:400 Text row number 1 * 111111111111111111111111 * Text row number 2 * 222222222222222222222222 * Text row number 3 * 333333333333333333333333 * Text row number 4 * 444444444444444444444444 * Text row number 5 * 555555555555555555555555 * Text row number 6 * 666666666666666666666666 * Text row number 7 * 777777777777777777777777 * Text row number 8 * 888888888888888888 OK AT#FTPRECV=200

#FTPRECV – Receive Data In Command Mode	
	#FTPRECV:200 88888 * Text row number 9 * 99999999999999999999999 * Text row number 10 * AAAAAAAAAAAAAAAAAAAAAAAA* Text row number 11 * BBBBBBBBBBBBBBBBBBBBBBBBB * Text row number 12 * CCCCCCCCCCCCCCC OK *Note: to check when you have received complete file it's possible to use* ***AT#FTPGETPKT*** *read command:* AT#FTPGETPKT? #FTPGETPKT:sample.txt,0,1 OK *(you will get <**eof**> set to 1)*

5.6.8.18. FTP Append Extended - #FTPAPPEXT

#FTPAPPEXT - FTP Append Extended	
AT#FTPAPPEXT= <bytestosend>[,<eof>]	This command permits to send data on a FTP data port while the module is in command mode. FTP data port has to be previously opened through **#FTPPUT** (or **#FTPAPP**) with <**connMode**> parameter set to **command mode** connection. Parameters: <**bytestosend**> - number of bytes to be sent 1..1500 <**eof**> - data port closure 0 – normal sending of data chunk 1 – close data port after sending data chunk 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 (all or part of the) data are successfully sent, then the response is: #FTPAPPEXT:<sentbytes> OK Where <**sentbytes**> are the number of sent bytes. Note: <**sentbytes**> could be less than <**bytestosend**>

#FTPAPPEXT - FTP Append Extended	
	If data sending fails for some reason, an error code is reported.
AT#FTPAPPEXT=?	Test command reports the supported range of values for parameters <**bytestosend**> and <**eof**>
Example	AT#FTPOPEN=”IP”,username,password OK AT#FTPPUT=<filename>,1 *(the new param 1 means that we open the connection in command mode)* OK *Here data socket will stay opened, but interface will be available (command mode)* AT#FTPAPPEXT=Size *>… write here the binary data. As soon Size byte are written, data are sent and OK is returned* #FTPAPPEXT:<SentBytes> OK …….. *Last #FTPAPPEXT will close the data socket, because second (optional) parameter has this meaning:* AT#FTPAPPEXT=Size,1 *>… write here the binary data. As soon Size byte are written, data are sent and OK is returned* #FTPAPPEXT:<SentBytes> OK *If the user has to reopen the data port to send another (or append to the same) file, he can restart with the FTPPUT (or FTPAPP).* *Then FTPAPPEXT, … to send the data chunks on the reopened data port.* *Note: if while sending the chunks the data port is closed from remote, user will be aware of it because #FTPAPPEXT will indicatd ERROR and cause (available if previously issued the command AT+CMEE=2) will indicate that socket has been closed.* *Also in this case obviously, data port will have to be reopened with FTPPUT and so on...(same sequence)*

5.6.9. Enhanced Easy GPRS® Extension AT Commands

5.6.9.1. 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.

#USERID - Authentication User ID	
	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**>. The allowed maximum length is 127.
Example	AT#USERID="myName" OK AT#USERID? #USERID: "myName" OK

5.6.9.2. 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**>. The allowed maximum length is 127.
Example	AT#PASSW="myPassword" OK

5.6.9.3. 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.

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

5.6.9.4. 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

5.6.9.5. 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 PDP context.

#SKTTO - Socket Inactivity Time-Out	
	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 PDP context deactivated.
AT#SKTTO?	Read command reports the current socket inactivity time-out value.
AT#SKTTO=?	Test command returns the allowed values for parameter **<tout>**.
Example	AT#SKTTO=30 OK *->(30 sec. time-out)* AT#SKTTO? #SKTTO: 30 OK

5.6.9.6. Socket Definition - #SKTSET

#SKTSET - Socket Definition	
AT#SKTSET= **[<socket type>,** **<remote port>,** **<remote addr>,** **[<closure type>],** **[<local port>],** **[<userIpType]]**	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 1..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 valid IPv6 address in the format: xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx or xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.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 1..65535 - port number (factory default is 0) **<userIpType>** - ip type for socket to open 0 – no ip type chosen;[default] 1 – ipv4. 2 – ipv6.

#SKTSET - Socket Definition	
	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 PDP context 1 is correctly set with **+CGDCONT** - the authentication parameters are set **(#USERID**, **#PASSW**) - the PS or EPS 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>,<userIpType>**
AT#SKTSET=?	Test command returns the allowed values for the parameters.
Example	AT#SKTSET=0,1024,"www.telit.net" OK
Note	Issuing command #QDNS will overwrite <remote addr> setting.

5.6.9.7. Query DNS - #QDNS

#QDNS - Query DNS	
AT#QDNS= **[<host name>** **[,<userIpType>]]**	Execution command executes a DNS query to solve the host name into an IP address. Parameter: **<host name>** - host name, string type. **<userIpType>** - in dual stack case the user can chose the ip type to get IP address. ACCording to this parameter DNS request will be sent. 1 - ipv4. 2 – ipv6. 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 PDP 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** Note: **<userIpType>** is only usable when AT+CGDCONT is ipv4v6. Note: **when <userIpType> is "no ip type chosen**" ipv6 will be requested firstly. When ipv6 DNS server doesn't support so ipv4 will be requested.

#QDNS - Query DNS	
AT#QDNS=?	Test command returns the allowed values for parameter, in the format: **#QDNS: <host name>,< userIpType>**
Note	This command requires that the authentication parameters are correctly set and that the PS or EPS network is present. This command works on the PDP context 1 and on the first ConnID.

5.6.9.8. DNS Response Caching - #CACHEDNS

#CACHEDNS - DNS Response Caching	
AT#CACHEDNS= [<mode>]	Set command enables caching a mapping of domain names to IP addresses, as does a resolver library. Parameter: **<mode>** 0 - caching disabled; it cleans the cache too 1 - caching enabled Note: the validity period of each cached entry (i.e. how long a DNS response remains valid) is determined by a value called the **Time To Live** (**TTL**), set by the administrator of the DNS server handing out the response. Note: it is recommended to clean the cache, if command **+CCLK** has been issued while the DNS Response Caching was enabled
AT#CACHEDNS?	Read command reports whether the DNS Response Caching is currently enabled or not, in the format: **#CACHEDNS: <mode>**
AT#CACHEDNS=?	Test command returns the currently cached mapping along with the range of available values for parameter **<mode>**, in the format: **#CACHEDNS: [<hostn*1*>,<IPaddr*1*>,[…,[<hostn*n*>,<IPaddr*n*>,]]](0,1)** where: **<hostn*n*>** - hostname, string type **<IPaddr*n*>** - IP address, string type, in the format **"xxx.xxx.xxx.xxx"**

5.6.9.9. 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 – A numeric parameter which specifies a particular PDP context definition. (see +CGDCONT command) **<primary>** **Ipv4- manual primary DNS server**, string type, in the format

#DNS – Manual DNS Selection	
	"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") **Ipv6- manual primary DNS server**, string type, in the format **"xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.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 "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0"). Ipv6 can also be in HEX format: **"xxxx.xxxx.xxxx.xxxx.xxxx.xxxx.xxxx.xxxx"** **<secondary>** **Ipv4- 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"). **Ipv6- manual primary DNS server**, string type, in the format **"xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.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 "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0"). Ipv6 can also be in HEX format: **"xxxx.xxxx.xxxx.xxxx.xxxx.xxxx.xxxx.xxxx"** Note: if **<primary> is "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"** 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, in the format: **[#DNS: <cid>,<primary>,<secondary>[<CR><LF>** **#DNS: <cid>,<primary>,<secondary>]]** **In case +cgdcont** determined as ipv4v6 the format is **[#DNS: <cid>,<primary ip4>,<primary ip6>,<secondary ip4>,<secondary ip6>[<CR><LF>** **#DNS: <cid>,<primary ip4>,<primary ip6>,<secondary ip4>,<secondary ip6>]]**
AT#DNS=?	Test command reports the supported range of values for the **<cid>** parameter.only, in the format: **#DNS: (1,5),,**

5.6.9.10. 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 PDP context 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.*

5.6.9.11. 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.

5.6.9.12. 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*

5.6.9.13. PDP Context Activation - #GPRS

#GPRS - PDP Context Activation	
AT#GPRS= **[<mode>]**	Execution command deactivates/activates the PDP context, eventually proceeding with the authentication with the parameters given with #PASSW and #USERID. Parameter: **<mode>** - PDP context activation mode 0 - PDP context deactivation request 1 - PDP context activation request In the case that the PDP context has been activated, the result code **OK** is preceded by the intermediate result code: If IP or IPV6 PDP context: **+IP: <ip_address_obtained>** For DUAL STACK IPV4V6 PDP context: **+IP: [<ipAddrV4>],[<ipAddrV6>]** Where: **<ipAddrV4>** - ip address ipv4(if v4 PDP context activated) **<ipAddrV6>** - ip address ipv6(if v6 PDP context activated) reporting the local IP address obtained from the network. Note: if the cid 1was activated by +CGACT, Activation request/ Deactivation

#GPRS - PDP Context Activation	
	request by #GPRS returns error.
AT#GPRS?	Read command reports the current status of the PDP context, in the format: **#GPRS: <status>** where: **<status>** 0 - PDP context deactivated 1 - PDP context activated 2 - PDP context activation pending.
AT#GPRS=?	Test command returns the allowed values for parameter **<mode>**.
Example	AT#GPRS=1 +IP: 129.137.1.1 OK *Now PDP Context has been activated and our IP is 129.137.1.1* AT#GPRS=0 OK *Now PDP context has been deactivated, IP is lost.*

5.6.9.14. Socket Dial - #SKTD

#SKTD - Socket Dial	
AT#SKTD= **[<socket type>,** **<remote port>,** **<remote addr>,** **[<closure type>],** **[<local port>],** **[<userIpType]]**	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 1..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 valid IPv6 address in the format: xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx or xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.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 1..65535 - port number (factory default is 0) **<userIpType>** - ip type for socket to open 0 – no ip type chosen;[default] 1 – ipv4.

#SKTD - Socket Dial	
	2 – ipv6. 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 PDP context 1 is correctly set with +CGDCONT - the authentication parameters are set **(**#USERID, #PASSW) the PS or EPS coverage is enough to permit a connection - the PDP context has been activated with **AT#GPRS=1 or AT#SGACT** 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>,<userIpType>**
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

5.6.9.15. 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(default) 1 - UDP

#SKTL - Socket Listen	
	<input port> - local host input port to be listened 1..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 PDP context 1 is correctly set with +CGDCONT - the authentication parameters are set (#USERID, #PASSW) - the PS or EPS coverage is enough to permit a connection - the PDP context has been activated with **AT#GPRS=1 or AT#SGACT** 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** Note: when closing the listening socket <input port> is a don't care parameter
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
AT#SKTL=?	Test command returns the allowed values for parameters **<mode>**, **<socket type>**, **<input port>** and **<closure type>**.
Example	*Activate PDP context*

#SKTL - Socket Listen	
	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* *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 PDP 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.

5.6.9.16. 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>.**

5.6.9.17. 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 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 **ACCEPT**. That is because source IP address of remote host could be reject to the type of ongoing service. For example, when it comes to IMS service, Proxy server like P-CSCF tends to change it's source IP address and communicates DUT with the changed IP address. The IMS connection could be declined by DUT as long as it keeps firewall rule dropped. 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. If you need to add an ACCEPT chain by <action> parameter, you have to remove all chains(DROP everything) first because firewall general policy is ACCEPT.
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*

#FRWL - Firewall Setup	
	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 #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. It will return ERROR if executed using SMSATRUN digest mode or TCPATRUN server mode.

5.6.9.18. Firewall Setup for IPV6 addresses - #FRWLIPV6

#FRWLIPV6 - Firewall Setup for IPV6 addresses	
AT#FRWLIPV6= **[<action>,** **<ip_address>,** **<net mask>]**	Execution command controls the internal firewall settings for IPV6 addresses. 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. xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx or in the format yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy **<net_mask>** - mask to be applied on the **<ip_addr>**; string type, it can be any valid IP address mask in the format: xxx.xxx.xxx.xxx. xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx or in the format yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy 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#FRWLIPV6?	Read command reports the list of all **ACCEPT** chain rules registered in the

#FRWLIPV6 - Firewall Setup for IPV6 addresses	
	Firewall settings in the format: **#FRWLIPV6: <ip_addr>,<net_mask>** **#FRWLIPV6: <ip_addr>,<net_mask>** **….** **OK**
AT#FRWLIPV6=?	Test command returns the allowed values for parameter **<action>.**

5.6.9.19. GPRS Data Volume - #GDATAVOL

#GDATAVOL - GPRS Data Volume	
AT#GDATAVOL=[<mode>]	Execution command reports, for every active PDP context, the amount of data the last PS session received and transmitted, or it will report the total amount of data received and transmitted during all past PS sessions, since last reset. Parameter: **<mode>** 0 - it resets the PS data counter for the all the available PDP contexts (1-5) 1 - it reports the last PS session data counter for the all the set PDP contexts (i.e. all the PDP contexts with APN parameter set using +CGDCONT), in the format: **#GDATAVOL: <cid*n*>,<tot*n*>,<sent*n*>,<received*n*>[<CR><LF>** **#GDATAVOL: <cid*m*>,<tot*m*>,<sent*m*>,<received*m*>[…]]** where: **<cid*n*>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition. **<tot*n*>** - number of bytes either received or transmitted in the last PS session for **<cid*n*>** PDP context; **<sent*n*>** - number of bytes transmitted in the last PS session for **<cid*n*>** PDP context; **<received*n*>** - number of bytes received in the last PS session for **<cid*n*>** PDP context; 2 - it reports the total PS data counter, since last reset, for the all the set PDP contexts (i.e. all the PDP context with APN parameter set using **+CGDCONT**), in the format: **#GDATAVOL: <cid*n*>,<tot*n*>,<sent*n*>,<received*n*>[<CR><LF>** **#GDATAVOL: <cid*m*>,<tot*m*>,<sent*m*>,<received*m*>[…]]** where: **<cid*n*>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition. **<tot*n*>** - number of bytes either received or transmitted, in every PS session since last reset, for **<cid*n*>** PDP context; **<sent*n*>** - number of bytes transmitted, in every PS session since last reset, for

#GDATAVOL - GPRS Data Volume	
	<**cid*n***> PDP context; <**receivedn**> - number of bytes received, in every PS session since last reset, for <**cid*n***> PDP context; Note: last PS session counters are not saved in NVM so they are loosen at power off. Note: total PS session counters are saved on NVM.
AT#GDATAVOL=?	Test command returns the range of supported values for parameter **<mode>.**
Note	

5.6.9.20. ICMP Ping Support - #ICMP

#ICMP – ICMP Ping Support	
AT#ICMP=<mode>	Set command enables/disables the ICMP Ping support. Parameter: **<mode>** 0 - disable ICMP Ping support (default) 1 - enable firewalled ICMP Ping support: the module is sending a proper ECHO_REPLY only to a subset of IP Addresses pinging it; this subset of IP Addresses has been previously specified through **#FRWL** (see) 2 - enable free ICMP Ping support; the module is sending a proper ECHO_REPLY to every IP Address pinging it.
AT#ICMP?	Read command returns whether the ICMP Ping support is currently enabled or not, in the format: **#ICMP: <mode>**
AT#ICMP=?	Test command reports the supported range of values for the **<mode>** parameter.

5.6.9.21. Ping Request - #PING

#PING – Ping Request	
AT#PING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>]]]]	Set command sends a Ping Echo Request messages and to receive the corresponding Echo Reply. Parameter: **<IPaddr>** - Address of the remote host. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any valid IPv6 address in the format: "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" or "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query

#PING – Ping Request	
	<retryNum> - Number of Ping Echo Request to be sent: 1-64 (default 4) **<len>** - Length of Ping Echo Request message 32-1460 (default 32) **<timeout>** - The timeout, in 100 ms units, waiting a single Echo Reply: 1-600 (default 50) **<ttl>** - Time to live: 1-255 (default 128) Once the single Echo Reply is received a string like that this is displayed: **#PING:<replyId>,<IpAddress>,<replyTime><ttl>** Where: **<replyId>** - Echo Reply number **<IpAddress>** - IP address of the remote host **<replyTime>** - Time, in 100ms units, required to receive the response **<ttl>** - Time to live of the Echo Reply message.
AT#PING=?	Test command reports the supported range of values for the **#PING** command parameters
Example	AT#PING=www.telit.com #PING: 01,”81.201.117.177”,6,50 #PING: 02,”81.201.117.177”,5,50 #PING: 03,”81.201.117.177”,6,50 #PING: 04,”81.201.117.177”,5,50 OK
Note	When the Echo Request timeout expires (no reply received on time) the response will contain **<replyTime>** set to 600 and **<ttl>** set to 255. To receive the corresponding Echo Reply is not required to enable separately AT#ICMP Before sending PING request the PDP context must have been activated by AT#SGACT or AT#GPRS

5.6.9.22. DNS form Network - #NWDNS

#NWDNS – DNS from Network

#NWDNS – DNS from Network	
AT#NWDNS=[<cid>[,<cid>[,…]]]	Execution command returns a list of primary and secondary DNS addresses for the specified PDP context identifiers Parameters: **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). Note: if no **<cid>** is specified, the DNS addresses for all **defined** contexts are returned. Note: issuing the command with more than 6 parameters raises an error. Note: the command returns only one row of information for every specified **<cid>**, even if the same **<cid>** is present more than once. The command returns a row of information for every specified **<cid>** whose context has been already defined. No row is returned for a **<cid>** whose context has not been defined yet. Response format is: **#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress>[<CR><LF>** **#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress> […]]** where: **<cid>** - context identifier, as before **<PDNSaddress>,<SDNSaddress>** - primary and secondary DNS addresses set through AT#DNS command. If not set, they are the primary and secondary DNS addresses assigned during the PDP context activation.
AT#NWDNS=?	Test command returns a list of defined **<cid>**s.

5.6.9.23. Configure Protocol Parameters - #PROTOCOLCFG

#PROTOCOLCFG – Configure Protocol Parameters	
AT#PROTOCOLCFG=<protocol>,<cid>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>]]]	This command sets the configuration parameters for specific application Parameters: **<protocol>** - string that represents the application **<cid>** - PDP context identifier **1**..5 – Numeric parameter which specifies a particular PDP context ID to be used by the specific application. (see **+CGDCONT** command). Note: the parameters are automatically saved in NVM

#PROTOCOLCFG – Configure Protocol Parameters	
AT#PROTOCOLCFG?	Read command returns the current settings in the format: **#PROTOCOLCFG: "FTP",1,0,0,0<CR><LF>** **#PROTOCOLCFG: "SMTP",1,0,0,0<CR><LF>** **#PROTOCOLCFG: "PING",1,0,0,0<CR><LF>** **#PROTOCOLCFG: "SSL",1,0,0,0<CR><LF>**
AT#PROTOCOLCFG=?	Test command returns the range of supported values for all the parameters

5.6.10. SMS AT Commands

5.6.10.1. Move Short Message To Other Memory - #SMSMOVE

#SMSMOVE – Move Short Message To Other Memory	
AT#SMSMOVE=[<index>]	Execution command moves selected Short Message from current memory to destination memory. Parameter: **<index>** - message index in the memory selected by **+CPMS** command. It can have values form 1 to N, where N depends on the available space (see **+CPMS**) Note: if the destination memory is full, an error is returned.
AT#SMSMOVE?	Read command reports the message storage status of the current memory and the destination memory in the format: **#SMSMOVE:** **<curr_mem>,<used_curr_mem>,<total_curr_mem>,<dest_mem>,<used_dest_mem>,<total_dest_mem>** Where: - **<curr_mem>** is the current memory, selected by **+CPMS** command. It can assume the values **"SM"** or **"ME"** - **<used_curr_mem>** is the number of SMs stored in the current memory - **<total_curr_mem>** is the max number of SMs that the current memory can contain - **<dest_mem>** is the destination memory. It can assume the values **"SM"** or **"ME"** - **<used_dest_mem>** is the number of SMs stored in the destination memory - **<total_dest_mem>** is the max number of SMs that the destination memory can contain
AT#SMSMOVE=?	Test command reports the supported values for parameter **<index>**
Example	AT+CPMS="ME","SM","SM" +CPMS: 3,100,0,20,0,20 OK AT#SMSMOVE? #SMSMOVE: "ME",3,100,"SM",0,20 OK //the current memory is ME where 3 SMs are stored; the destination memory is SIM that is empty AT+CMGL=ALL

#SMSMOVE – Move Short Message To Other Memory	

	+CMGL: 1,"STO UNSENT","32XXXXXXXX","",
	test 1
	+CMGL: 2,"STO UNSENT","32XXXXXXXX","",
	test 2
	+CMGL: 3,"STO UNSENT","32XXXXXXXX","",
	test 3
	OK
	//list the SMs to discover the memory index
	AT#SMSMOVE=1
	OK
	//move the SM in the first position of ME to SIM
	AT#SMSMOVE?
	#SMSMOVE: "ME",2,100,"SM",1,20
	OK
	//now we have 2 SMs in ME and 1 in SIM

5.6.10.2. SMS Commands Operation Mode - #SMSMODE

#SMSMODE – SMS Commands Operation Mode	
AT#SMSMODE=[<mode>]	Set command enables/disables the check for presence of SMS Service Centre Address in the FDN phonebook Parameter: **<mode>** 1 - disables the check for presence of SMS SCA in FDN 2 - enables the check for presence of SMS SCA in the FDN phonebook when FDN are enabled; if the SMS SCA is not present, then a SMS cannot be sent (default)
AT#SMSMODE?	Read command reports whether the check of SMS SCA in FDN is enabled or not, in the format: **#SMSMODE: <mode>** (**<mode>** described above)
AT#SMSMODE=?	Test command reports the supported range of values for parameter <**mode**>

5.6.10.3. Select 3GPP or 3GPP2 Format for MO SMS - #SMSFORMAT

#SMSFORMAT – Select 3GPP or 3GPP2 Format for MO SMS	
AT#SMSFORMAT=[<mode>]	Set command selects the 3GPP or 3GPP2 format for MO SMS. Parameter: **<mode>** - MO SMS format 0 – 3GPP format (factory default) 1 – 3GPP2 format Note: The input format for 3GPP2 SMS is according to Telit syntax: see 5.5.5
AT# SMSFORMAT?	Read command reports the current setting of parameter <**mode**>, in the format: **#SMSFORMAT: <mode>** (**<mode>** described above)
AT# SMSFORMAT =?	Test command returns the supported range of values for parameter **<mode>**

5.6.10.4. Domain Configuration for Outgoing SMS - #ISMSCFG

#ISMSCFG – Domain Configuration for Outgoing SMS	
AT# ISMSCFG = [<mode>]	Set command changes the configuration parameter for outgoing SMS, which will be used to route the outgoing SMS either over CPS or over IMS (IP Multimedia Core Network Subsystem). Parameter: **<mode>** 0 - the SMS service is not to be invoked over the IP networks; 1 - the SMS service is preferred to be invoked over the IP networks (default) NOTE: the setting is saved in NVM.
AT# ISMSCFG?	Read command returns the current domain selected to route the outgoing SMS in the format: **#ISMSCFG: <mode>** (**<mode>** described above)
AT# ISMSCFG =?	Test command returns the supported range of values for parameter **<mode>**

5.6.11. E-mail Management AT Commands

5.6.11.1. E-mail SMTP Server - #ESMTP

#ESMTP - E-mail SMTP Server	
AT#ESMTP= [<smtp>]	Set command sets the SMTP server address, used for E-mail sending. SMTP server can be specified as IP address or as nick name. Parameter: **<smtp>** - SMTP server address, 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 “”) Note: the max length for **<smtp>** is the output of Test command.
AT#ESMTP?	Read Command reports the current SMTP server address, in the format: **#ESMTP: <smtp>**
AT#ESMTP=?	Test command returns the max length for the parameter **<smtp>.**
Example	AT#ESMTP="smtp.mydomain.com" OK
Note	The SMTP server used shall be inside the APN space (the smtp server provided by the network operator) or it must allow the Relay, otherwise it will refuse to send the e-mail.

5.6.11.2. E-mail Sender Address - #EADDR

#EADDR - E-mail Sender Address	
AT#EADDR=	Set command sets the sender address string to be used for sending the e-mail.

#EADDR - E-mail Sender Address	
[<e-add>]	Parameter: **<e-addr>** - sender address, string type. - any string value up to max length reported in the Test command. (factory default is the empty string “”)
AT#EADDR?	Read command reports the current sender address, in the format: **#EADDR: <e-addr>**
AT#EADDR=?	Test command returns the maximum allowed length of the string parameter **<e-addr>.**
Example	AT#EADDR="me@email.box.com" OK AT#EADDR? #EADDR: "me@email.box.com" OK

5.6.11.3. E-mail Authentication User Name - #EUSER

#EUSER - E-mail Authentication User Name	
AT#EUSER= [<e-user>]	Set command sets the user identification string to be used during the authentication step of the SMTP. Parameter: **<e-user>** - e-mail authentication User ID, string type. - any string value up to max length reported in the Test command. (factory default is the empty string “”) Note: if no authentication is required then the **<e-user>** parameter shall be empty "".
AT#EUSER?	Read command reports the current user identification string, in the format: **#EUSER: <e-user>**
AT#EUSER=?	Test command returns the maximum allowed length of the string parameter **<e-user>**.
Example	AT#EUSER="myE-Name" OK AT#EUSER? #EUSER: "myE-Name" OK
Note	It is a different user field than the one used for PS or EPS authentication (see #USERID).

5.6.11.4. E-mail Authentication Password - #EPASSW

#EPASSW - E-mail Authentication Password	
AT#EPASSW=[<e-pwd>]	Set command sets the password string to be used during the authentication step of the SMTP. Parameter: **<e-pwd>** - e-mail authentication password, string type. - any string value up to max length reported in the Test command. (factory default is the empty string “”) Note: if no authentication is required then the **<e-pwd>** parameter shall be empty "".
AT#EPASSW=?	Test command returns the maximum allowed length of the string parameter **<e-pwd>**.
Example	AT#EPASSW="myPassword" OK
Note	It is a different password field than the one used for PS or EPS authentication (see #PASSW).

5.6.11.5. E-mail Sending - #EMAILD

#EMAILD - E-mail Sending	
AT#EMAILD=[<da>,<subj>]	Execution command sends an e-mail message if PDP context has already been activated with **AT#SGACT=1,1** or **AT#GPRS=1**. Parameters: **<da>** - destination address, string type. (maximum length 100 characters) **<subj>** - subject of the message, string type. (maximum length 100 characters) The device responds to the command with the prompt '>' and awaits for the message body text. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). If e-mail message is successfully sent, then the response is **OK**. If message sending fails for some reason, an error code is reported Note: Care must be taken to ensure that during the command execution, no other commands are issued. To avoid malfunctions is suggested to wait for the **OK** or **ERROR / +CMS ERROR:<err>** response before issuing further commands. Note: Maximum length for message body is 1024 bytes. Trying to send more data will cause the surplus to be discarded and lost.
AT#EMAILD=?	Test command returns the **OK** result code.

#EMAILD - E-mail Sending	
Example	AT#EMAILD=”me@myaddress.com”,”subject of the mail” >message body… this is the text of the mail message… CTRL-Z *..wait..* OK *Message has been sent.*

5.6.11.6. E-mail Parameters Save - #ESAV

#ESAV - E-mail Parameters Save	
AT#ESAV	Execution command saves the actual e-mail parameters in the NVM of the device. The values stored are: - E-mail User Name - E-mail Password - E-mail Sender Address - E-mail SMTP server
AT#ESAV=?	Test command returns the **OK** result code.
Note	If some parameters have not been previously specified then a default value will be taken.

5.6.11.7. E-mail Parameters Reset - #ERST

#ERST - E-mail Parameters Reset	
AT#ERST	Execution command resets the actual e-mail parameters in the NVM of the device to the default ones. The values reset are: - E-mail User Name - E-mail Password - E-mail Sender Address - E-mail SMTP server
AT#ERST=?	Test command returns the **OK** result code.

5.6.11.8. SMTP Read Message - #EMAILMSG

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

5.6.11.9. Send Mail with Attachment - #SMTPCL

#SMTPCL – Send Mail with Attachment	
AT#SMTPCL=<da>,<subj>,<att>[,<filename>,<encod>]	This command permits to send an email with different types of attachments if PDP context has already been activated (#SGACT, #GPRS). After sending message body text (as with #EMAILD), the command switch to

#SMTPCL – Send Mail with Attachment	
	online mode if attachment has to be sent. While in online mode data received on the serial port are transmitted on the SMTP socket as MIME attachment. The escape sequence has to be sent to close the SMTP connection. Encoding of data received on the serial port is performed if required (binary data), before transmission on the SMTP socket. Parameters: <**da**> - destination address, string type. (maximum length 100 characters) <**subj**> - subject of the message, string type. (maximum length 100 characters) <**att**> - attached file flag 0 – no attachment 1 – attach a txt file 2 – attach a binary file(jpg,bin,pdf,...) <**filename**> - attached file name (maximum length 50 characters) <**encod**> -Content-Transfer-Encoding used for attachment 0 – "7bit" means data all represented as short lines of US-ASCII data 1 – "base64" designed to represent arbitrary sequences of octets in a form that need not be humanly readable Note: if no attachment (<**att**> 0) has to be sent, the behavior is the same as with #EMAILD. OK after CTRL-Z is returned(if connection was successful), the switch to online mode is not performed. Note: If a txt file (<**att**>=1) is attached, only <**encod**>0("7bit") is possible. If a binary file (<**att**>=2) is attached, only <**encod**>1("base64") is possible. Note: if <**att**>=0 and <**filename**> is present and not empty, the attachment won't be considered Note: if <**att**> 1 or 2 and <**filename**> is not present, command will return an ERROR Note: default SMTP port(25) is used
AT#SMTPCL=?	Test command reports the supported range of values for parameters <da>,<subj>,<att>[,<filename>,<encod>]

#SMTPCL – Send Mail with Attachment	
Examples	at#smtpcl="me@myaddress.com","test1",1,"sample.txt",0 >message body...this is the text of the mail message… Send CTRL-Z CONNECT …data received on the serial port are sent as attachment…. Send escape sequence to close the SMTP connection +++ NO CARRIER at#smtpcl="me@myaddress.com","test2",2,"image.jpg",1 >message body...this is the text of the mail message… Send CTRL-Z CONNECT …data received on the serial port are base64-encoded and sent as attachment…. Send escape sequence to close the SMTP connection +++ NO CARRIER

5.6.11.10. E-mail SMTP Port - #ESMTPPORT

#ESMTPPORT – E-mail SMTP Port	
AT#ESMTPPORT=<Port>	This command permits to set SMTP port Parameter: **<port>** - SMTP port to contact (default 25) 25..465,587 Note: SMTP protocol is used on the selectd port Note: the value set by command is directly stored in NVM
AT#ESMTPPORT?	Read command reports the currently selected <Port> in the format: **#ESMTPPORT: <Port>**
AT#ESMTPPORT=?	Test command reports the supported range of values for parameter <Port>

5.6.12. HTTP AT Commands

5.6.12.1. Configure HTTP parameters - #HTTPCFG

#HTTPCFG – configure HTTP parameters

#HTTPCFG – configure HTTP parameters	
AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout> [,<cid>[,<pkt_size>][,<UNUSED_1>[,<UNUSED_2>]]]]]]]]]	This command sets the parameters needed to the HTTP connection Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<server_address>** - String parameter indicating the IP address of the HTTP server. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any valid IPv6 address in the format: "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" Or "XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX" - any host name to be solved with a DNS query Default: "" for first and second profile; "m2mlocate.telit.com" for third profile. **<server_port>** - Numeric parameter indicating the TCP remote port of the HTTP server to connect to. Default: 80 for first and second profile; 9978 for third profile. Range 1...65535. **<auth_type>** - Numeric parameter indicating the HTTP authentication type. 0 – no authentication (default) 1 – basic authentication **<username>** - String parameter indicating authentication user identification string for HTTP. **<password>** - String parameter indicating authentication password for HTTP. **<ssl_enabled>** - Numeric parameter indicating if the SSL encryption is enabled. 0 – SSL encryption disabled (default) 1 – SSL encryption enabled (not yet implemented and not available for setting) **<timeout>**: Numeric parameter indicating the time interval in seconds to wait for receiving data from HTTP server. Range: (1- 65535). Default: 120. **<cid>** - Numeric parameter indicating the PDP Context Identifier. Range: (1-5). Default: 1 <**pkt_size**> - send(#HTTPSND) or recv(#HTTPRCV) size for data sending or receiving. 0 – select automatically default value(300). 1..1500 – send or recv size in bytes. Note: an ERROR is issued if <UNUSED_1> and <UNUSED_2> parameters are set with a value different from 0. Note: a special form of the Set command, **#HTTPCFG=<prof_id>**, causes the values for profile number **<prof_id>** to reset to default values.

#HTTPCFG – configure HTTP parameters	
	Note: if the SSL encryption is enabled, the **<cid>** parameter has to be set to 1. Note: only one profile can use the SSL encryption. Note: values are automatically saved in NVM.
AT#HTTPCFG?	Read command returns the current settings for each defined profile in the format: **#HTTPCFG**: **<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,<pkt_size>,0,0<CR><LF>[<CR><LF>#HTTPCFG:** **<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>>,<pkt_size>,0,0]<CR><LF>[…]]**
AT#HTTPCFG=?	Test command returns the supported range of parameters **<prof_id>, <server_port>, <auth_type>, <ssl_enabled>, <timeout>, <cid>** and **<pkt_size>** and the maximum length of **<server_address>, <username>** and **<password>** parameters in the format: **#HTTPCFG: (list of supported <prof_id>s),<s_length>,(list of supported <server_port>s), (list of supported <auth_type>s),<u_length>,<p_length>,(list of supported <ssl_enabled>s),(list of supported <timeout>s),(list of supported <cid>s) ,(list of supported <pkt_size>s),(<UNUSED_1>),(<UNUSED_2>)** where: **<s_length>** - integer type value indicating the maximum length of parameter **<server_address>**. **<u_length>** - integer type value indicating the maximum length of parameter **<username>**. **<p_length>** - integer type value indicating the maximum length of parameter **<password>**

5.6.12.2. Send HTTP GET, HEAD or DELETE request - #HTTPQRY

#HTTPQRY – send HTTP GET, HEAD or DELETE request	
AT#HTTPQRY=<prof_id>,<command>,<resource>[,<extra_header_line>]	Execution command performs a GET, HEAD or DELETE request to HTTP server. Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<command>**: Numeric parameter indicating the command requested to HTTP server: 0 – GET 1 – HEAD 2 – DELETE

#HTTPQRY – send HTTP GET, HEAD or DELETE request	
	<resource>: String parameter indicating the HTTP resource (uri), object of the request **<extra_header_line>**: String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported. Note: the HTTP request header sent with #HTTPQRY always contains the "Connection: close" line, and it can not be removed. When the HTTP server answer is received, then the following URC is put on the serial port: **#HTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>** Where: **<prof_id>** is defined as above **<http_status_code>** is the numeric status code, as received from the server (see RFC 2616) **<content_type>** is a string reporting the "Content-Type" header line, as received from the server (see RFC 2616) **<data_size>** is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0. Note: if there are no data from server or the server doesn't answer within the time interval specified in **<timeout>** parameter of **#HTTPCFG** command, then the URC **#HTTPRING <http_status_code>** parameter has value 0.
AT#HTTPQRY=?	Test command reports the supported range of values for the parameters **<prof_id>** and **<command>** and the maximum length of **<resource>** parameter in the format: **#HTTPQRY: (list of supported <prof_id>s),(list of supported <command>s),<r_length>,<m_length>** where: **<r_length>** - integer type value indicating the maximum length of parameter **<resource>**. **<m_length>** - integer type value indicating the maximum length of parameter **<extra_header_line>**.

5.6.12.3. Send HTTP POST or PUT request - #HTTPSND

#HTTPSND – send HTTP POST or PUT request

#HTTPSND – send HTTP POST or PUT request	
AT#HTTPSND=<prof_id>,<command>,<resource>,<data_len>[,<post_param>[,<extra_header_line>]]	Execution command performs a POST or PUT request to HTTP server and starts sending data to the server. The device shall prompt a three character sequence **<greater_than><greater_than><greater_than>** **(IRA 62, 62, 62)** after command line is terminated with <CR>; after that the data can be entered from TE, sized **<data_len>** bytes. Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<command>**: Numeric parameter indicating the command requested to HTTP server: 0 – POST 1 – PUT **<resource>**: String parameter indicating the HTTP resource (uri), object of the request **<data_len>**: Numeric parameter indicating the data length to input in bytes **<post_param>**: Numeric/string parameter indicating the HTTP Content-type identifier, used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier: "0[:extension]" – "application/x-www-form-urlencoded" with optional extension "1[:extension]" – "text/plain" with optional extension "2[:extension]" – "application/octet-stream" with optional extension "3[:extension]" – "multipart/form-data" with optional extension other content – free string corresponding to other content type and possible sub-types **<extra_header_line>**: String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported. Note: the HTTP request header sent with #HTTPSND always contains the "Connection: close" line, and it can not be removed. When the HTTP server answer is received, then the following URC is put on the serial port: **#HTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>** Where: **<prof_id>** is defined as above **<http_status_code>** is the numeric status code, as received from the server (see RFC 2616) **<content_type>** is a string reporting the "Content-Type" header line, as

#HTTPSND – send HTTP POST or PUT request	
	received from the server (see RFC 2616) **<data_size>** is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0. Note: if there are no data from server or the server doesn't answer within the time interval specified in **<timeout>** parameter of **#HTTPCFG** command, then the URC **#HTTPRING <http_status_code>** parameter has value 0.
AT#HTTPSND=?	Test command returns the supported range of parameters **<prof_id>, <command>** and **<data_len>** and the maximum length of **<resource>, <post_param>** and **<extra_header_line>** parameters in the format: **#HTTPSND: (list of supported <prof_id>s),(list of supported <command>s), <r_length>, (list of supported <data_len>s),<p_length>,<m_length>** where: **<r_length>** - integer type value indicating the maximum length of parameter **<resource>**. **<p_length>** - integer type value indicating the maximum length of parameter **<post_param>**. **<m_length>** - integer type value indicating the maximum length of parameter **<extra_header_line>**
Example	*Post 100 byte without "Content-type" header* **AT#HTTPSND=0,0,"/",100** >>> *Post 100 byte with "application/x-www-form-urlencoded"* **AT#HTTPSND=0,0,"/",100,0** >>> *Post 100 byte with "multipart/form-data" and extension* **AT#HTTPSND=0,0,"/",100,"3:boundary=----FormBoundary"** >>>

5.6.12.4. Receive HTTP server data - #HTTPRCV

#HTTPRCV – receive HTTP server data	
AT#HTTPRCV=<prof_id>,[<maxByte>]	Execution command permits the user to read data from HTTP server in response to a previous HTTP module request. The module is notified of these data by the **#HTTPRING** URC. The device shall prompt a three character sequence **<less_than><less_than><less_than>** **(IRA 60, 60, 60)** followed by the data. If reading ends successfully, the response is OK; otherwise an error code is reported.

#HTTPRCV – receive HTTP server data	
	Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 <maxByte> - Max number of bytes to read at a time Range:0,300-1500 (default is 0 which means infinite size) Note: If unspecified for <maxByte>, server data will be transferred until it completes with once AT#HTTPRCV execution. Note: If the data are not present or the **#HTTPRING <http_status_code>** parameter has value 0, an error code is reported.
AT#HTTPRCV=?	Test command reports the supported range of values for **<prof_id>,<maxbyte>** parameter in the format: **#HTTPRCV: (list of supported <prof_id>s,<maxbyte>)**

5.6.13. SIM Toolkit AT Commands

5.6.13.1. SIM Tookit Interface Activation - #STIA

#STIA - SIM Tookit Interface Activation	
AT#STIA= [<mode> [,<timeout>]]	Set command is used to activate the SAT sending of unsolicited indications when a **proactive command** is received from SIM. Parameters: **<mode>** 0 - disable SAT 1 - enable SAT without unsolicited indication **#STN** (default) 2 - enable SAT and extended unsolicited indication **#STN** (see **#STGI**) 3 - enable SAT and reduced unsolicited indication **#STN** (see **#STGI**) 17 - enable SAT without unsolicited indication #STN and 3GPP TS 23.038 alphabet used 18 - enable SAT and extended unsolicited indication #STN (see #STGI) and 3GPP TS 23.038 alphabet used 19 - enable SAT and reduced unsolicited indication #STN (see #STGI)and 3GPP TS 23.038 alphabet used 33 - enable SAT without unsolicited indication #STN and UCS2 alphabet used 34 - enable SAT and extended unsolicited indication #STN (see #STGI)and UCS2 alphabet used 35 - enable SAT and reduced unsolicited indication #STN (see #STGI)and UCS2 alphabet used **<timeout>** - time-out for user responses 1.. 2 - time-out in minutes (default 2). Any ongoing (but unanswered) **proactive command** will be aborted automatically after **<timeout>** minutes. In this

#STIA - SIM Tookit Interface Activation

case, the terminal response is either "ME currently unable to process command", or if applicable, "No response from user". In addition an unsolicited indication will be sent to the external application:

#STN: <cmdTerminateValue>

where:
<cmdTerminateValue> is defined as **<cmdType>** + **terminate offset**; the terminate offset equals 100.

Note: 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:

- if **<mode>** parameter of **#STIA** command has been set to 3 (reduced unsolicited indication) an unsolicited indication will be sent, indicating the type of **proactive command** issued by the SIM:

  #STN: <cmdType>

- if **<mode>** parameter of **#STIA** command has been set to 2 (extended unsolicited indication) the format of the unsolicited indication depends on the specific command:

  if ***<cmdType>=1*** *(REFRESH)*

  an unsolicited notification will be sent to the user:

  #STN: <cmdType>,<refresh type>

  where:
  <refresh type>
  0 - SIM Initialization and Full File Change Notification;
  1 - File Change Notification;
  2 - SIM Initialization and File Change Notification;
  3 - SIM Initialization;
  4 - SIM Reset

  In this case neither **#STGI** nor **#STSR** commands are required:
  - **AT#STGI** is accepted anyway.
  - **AT#STSR=<cmdType>,0** will answer **OK** but do nothing.

  if ***<cmdType>=17*** *(SEND SS)*
  if ***<cmdType>=19*** *(SEND SHORT MESSAGE)*
  if ***<cmdType>=20*** *(SEND DTMF)*

#STIA - SIM Tookit Interface Activation

if ***<cmdType>=32*** *(PLAY TONE)*

an unsolicited notification will be sent if allowed by SIM (see GSM 11.14):

#STN: <cmdType>[,<text>]

where:
<text> - (optional) text to be displayed to user

In these cases neither **#STGI** nor **#STSR** commands are required:
- **AT#STGI** is accepted anyway.
- **AT#STSR=<cmdType>,0** will answer **OK** but do nothing.

In case of SEND SHORT MESSAGE (**<cmdType>**=19) command if sending to network fails an unsolicited notification will be sent

#STN: 119

if ***<cmdType>=33*** *(DISPLAY TEXT)*

an unsolicited notification will be sent if allowed by SIM (see GSM 11.14):

#STN: <cmdType>[,<cmdDetails>[,<text>]

where:
<cmdDetails> - unsigned Integer used as a bit field.
0..255 - used as a bit field:
bit 1:
0 - normal priority
1 - high priority
bits 2 to 7: reserved for future use
bit 8:
0 - clear message after a delay
1 - wait for user to clear message
<text> - (optional) text to be displayed to user

In this case:
1. if **<cmdDetails>/bit8** is **0** neither **#STGI** nor **#STSR** commands are required:
   - **AT#STGI** is accepted anyway.
   - **AT#STSR=<cmdType>,0** will answer **OK** but do nothing.
2. If **<cmdDetails>/bit8** is 1 **#STSR** command is required

if ***<cmdType>=40*** *(SET UP IDLE MODE TEXT)*

an unsolicited notification will be sent:

#STIA - SIM Tookit Interface Activation

#STN: <cmdType>[,<text>]

where:
<text> - (optional)text to be displayed to user

In these cases neither **#STGI** nor **#STSR** commands are required:
- **AT#STGI** is accepted anyway.
- **AT#STSR=<cmdType>,0** will answer **OK** but do nothing.

if ***<cmdType>=18*** *(SEND USSD)*

an unsolicited notification will be sent to the user:

#STN: <cmdType>[,<text>]

where:
<text> - optional text string sent by SIM

In this case:
- **AT#STSR=18,20** can be sent to end USSD transaction.
- **AT#STGI** is accepted anyway.
- **AT#STSR=<cmdType>,0** will answer **OK** but do nothing.

if ***<cmdType>=5*** *(SET UP EVENT LIST)*

an unsolicited notification will be sent:

#STN: <cmdType>[,<event list mask>]

where:
<event list mask> - (optional)hexadecimal number representing the list of events to monitor (see GSM 11.14)
- '00' = MT call
- '01' = Call connected
- '02' = Call disconnected
- '03' = Location status
- '04' = User activity
- '05' = Idle screen available
- '06' = Card reader status (if class "a" is supported)
- '07' = Language selection
- '08' = Browser Termination (if class "c" is supported)
- '09' = Data available (if class "e" is supported)
- '0A' = Channel status (if class "e" is supported)

#STIA - SIM Tookit Interface Activation

The hexadecimal number is actually a bit mask, where each bit, when set, indicates that the corresponding event has to be monitored (e.g., if <event list mask> is 0x0001, it means that MT call has to be monitored).

In these cases neither **#STGI** nor **#STSR** commands are required:
- **AT#STGI** is accepted anyway.
- **AT#STSR=<cmdType>,0** will answer **OK** but do nothing.

if ***<cmdType>=64*** *(OPEN CHANNEL)*

an unsolicited notification will be sent to the user:

#STN: <cmdType>[,<text>]

where:
<text> - optional text string sent by SIM

In this case:
- **AT#STSR=64,34** can be sent to reject request.
- **AT#STGI** is accepted anyway.
- **AT#STSR=<cmdType>,0** will start connection.

All other commands:

the unsolicited indication will report just the proactive command type:

#STN: <cmdType>

Note: if the **call control** or **SMS control facility in the SIM** is activated, when the customer application makes an outgoing call, or sends an SS or USSD, or an SMS, the following **#STN** unsolicited indication could be sent, according to GSM 11.14, to indicate whether the outgoing call has been accepted, rejected or modified by the SIM, or if the SMS service centre address or destination has been changed:

#STN: <cmdTerminateValue>,<Result>[,<TextInfo>[,<Number>[,<MODestAddr>]]]

where
<cmdTerminateValue>
150 - SMS control response
160 - call/SS/USSD response
<Result>
0 - Call/SMS not allowed
1 - Call/SMS allowed
2 - Call/SMS allowed with modification

#STIA - SIM Tookit Interface Activation	
	<Number> - Called number, Service Center Address or SS String in ASCII format. **<MODestAddr>** - MO destination address in ASCII format. **<TextInfo>** - alpha identifier provided by the SIM in ASCII format. Note: an unsolicited result code **#STN: 254** is sent if the user has indicated the need to end the proactive SIM application session (**AT#STSR=<cmdType>,**16 i.e. "proactive SIM application session terminated by the user" according to GSM 11.14). The TA does not need to respond directly, i.e. **AT#STSR** is not required. It is possible to restart the SAT session from the main menu again with the command **AT#STGI=37**. Note: The settings are saved on user profile and available on following reboot. SIM Toolkit activation/deactivation is only performed at power on.
AT#STIA?	Read command can be used to get information about the SAT interface in the format: **#STIA: <state>,<mode>,<timeout>,<SatProfile>** where: **<state>** - the device is in one of the following state: 0 - SIM has not started its application yet 1 - SIM has started its application (SAT main menu ready) **<mode>** - SAT and unsolicited indications enabling status (see above) **<timeout>** - time-out for user responses (see above) **<SatProfile>** - SAT Terminal Profile according to GSM 11.14, i. e. the list of SIM Application Toolkit facilities that are supported by the ME. The profile cannot be changed by the TA. Note: In SAT applications usually an SMS message is sent to the network provider containing service requests, e.g. to send the latest news. The provider returns a message with the requested information. Before activating SAT it is recommended to set the SMS text mode with command **AT+CMGF=1** and to enable unsolicited indications for incoming SMS messages with command **+CNMI**.
AT#STIA=?	Test command returns the range of available values for the parameters **<mode>** and **<timeout>**.
Note	Just one instance at a time, the one which first issued **AT#STIA=*n*** (with ***n*** different from zero), is allowed to issue SAT commands, and this is valid till the same instance issues **AT#STIA=0**.

#STIA - SIM Tookit Interface Activation	
	After power cycle another instance can enable SAT.
Note	A typical SAT session on AT interface starts after an **#STN: 37** unsolicited code is received, if enabled(see above). At that point usually an **AT#STGI=37** command is issued (see **#STGI**), and after the SAT main menu has been displayed on TE an **AT#STSR=37,0,x** command is issued to select an item in the menu (see **#STSR**).

5.6.13.2. SIM Tookit Get Information - #STGI

#STGI - SIM Tookit Get Information	
AT#STGI= **[<cmdType>]**	**#STGI** set command is used to request the parameters of a **proactive command** from the ME. Parameter: **<cmdType>** - **proactive command** ID according to GSM 11.14 (decimal); these are only those command types that use the AT interface; SAT commands which are not using the AT interface (not MMI related SAT commands, e.g. PROVIDE LOCAL INFORMATION) are executed without sending any indication to the user 1 - REFRESH 5 – SET UP EVENT LIST 16 - SET UP CALL 17 - SEND SS 18 - SEND USSD 19 - SEND SHORT MESSAGE 20 - SEND DTMF 32 - PLAY TONE 33 - DISPLAY TEXT 34 - GET INKEY 35 - GET INPUT 36 - SELECT ITEM 37 - SET UP MENU 40 – SET UP IDLE MODE TEXT 64 – OPEN CHANNEL Requested command parameters are sent using an **#STGI** indication: **#STGI: <parameters>** where **<parameters>** depends upon the ongoing **proactive command** as follows: *if **<cmdType>=1** (REFRESH)* **#STGI: <cmdType>,<refresh type>** where: **<refresh type>** 0 - SIM Initialization and Full File Change Notification;

	1 - File Change Notification; 2 - SIM Initialization and File Change Notification; 3 - SIM Initialization; 4 - SIM Reset *if* **<cmdType>=5** *(SET UP EVENT LIST)* **#STGI: <cmdType>,<event list mask>** where: **<event list mask>** - hexadecimal number representing the list of events to monitor (see GSM 11.14): - '00' = MT call - '01' = Call connected - '02' = Call disconnected - '03' = Location status - '04' = User activity - '05' = Idle screen available - '06' = Card reader status (if class "a" is supported) - '07' = Language selection - '08' = Browser Termination (if class "c" is supported) - '09' = Data available (if class "e" is supported) - '0A' = Channel status (if class "e" is supported) The hexadecimal number is actually a bit mask, where each bit, when set, indicates that the corresponding event has to be monitored (e.g., if <event list mask> is 0x0001, it means that MT call has to be monitored). *if* **<cmdType>=16** *(SET UP CALL)* **#STGI: <cmdType>,<commandDetails>,[<confirmationText>],** **<calledNumber>**where: **<commandDetails>** - unsigned integer, used as an enumeration 0 Set up call, but only if not currently busy on another call 1 Set up call, but only if not currently busy on another call, with redial 2 Set up call, putting all other calls (if any) on hold 3 Set up call, putting all other calls (if any) on hold, with redial 4 Set up call, disconnecting all other calls (if any) 5 Set up call, disconnecting all other calls (if any), with redial **<confirmationText>** - string for user confirmation stage **<calledNumber>** - string containing called number *if* **<cmdType>=17** *(SEND SS)* *if* **<cmdType>=18** *(SEND USSD)* *if* **<cmdType>=19** *(SEND SHORT MESSAGE)* *if* **<cmdType>=20** *(SEND DTMF)* *if* **<cmdType>=32** *(PLAY TONE)* *if* **<cmdType>=40** *(SET UP IDLE MODE TEXT)* *if* **<cmdType>=64** *(OPEN CHANNEL)* **#STGI: <cmdType>[,<text>]**

	where: **<text>** - text to be displayed to user *if* ***<cmdType>=33*** *(DISPLAY TEXT)* **#STGI: <cmdType>,<cmdDetails>[,<text>]** where: **<cmdDetails>** - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - normal priority 1 - high priority **bits 2 to 7**: reserved for future use **bit 8**: 0 - clear message after a delay 1 - wait for user to clear message **<text>** - text to be displayed to user *if* ***<cmdType>=34*** *(GET INKEY)* **#STGI: <cmdType>,<commandDetails>,<text>** where: **<commandDetails>** - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - Digits only (0-9, *, # and +) 1 - Alphabet set; **bit 2**: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet **bit 3**: 0 - Character sets defined by bit 1 and bit 2 are enabled 1 - Character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested **bits 4 to 7**: 0 **bit 8**: 0 - No help information available 1 - Help information available **<text>** - String as prompt for text. *if* ***<cmdType>=35*** *(GET INPUT)*

	#STGI: <cmdType>,<commandDetails>,<text>,<responseMin>, <responseMax>[,<defaultText>] where: **<commandDetails>** - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - Digits only (0-9, *, #, and +) 1 - Alphabet set **bit 2**: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet **bit 3**: 0 - ME may echo user input on the display 1 - User input shall not be revealed in any way. Hidden entry mode (see GSM 11.14) is only available when using digit input. In hidden entry mode only characters (‘0’-‘9’, ‘*’ and ‘#‘) are allowed. **bit 4**: 0 - User input to be in unpacked format 1 - User input to be in SMS packed format **bits 5 to 7**: 0 **bit 8**: 0 - No help information available 1 - Help information available **<text>** - string as prompt for text **<responseMin>** - minimum length of user input 0..255 **<responseMax>** - maximum length of user input 0..255 **<defaultText>** - string supplied as default response text *if **<cmdType>=36** (SELECT ITEM)* The first line of output is: **#STGI: <cmdType>,<commandDetails>,<numOfItems>[,<titleText>]** **<CR><LF>** One line follows for every item, repeated for **<numOfItems>**: **#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]** where: **<commandDetails>** - unsigned Integer used as a bitfield 0..255 - used as a bit field:

	bit 1: 0 - Presentation type is not specified 1 - Presentation type is specified in bit 2 **bit 2**: 0 - Presentation as a choice of data values if bit 1 = '1' 1 - Presentation as a choice of navigation options if bit 1 is '1' **bit 3**: 0 - No selection preference 1 - Selection using soft key preferred **bits 4 to 7**: 0 **bit 8**: 0 - No help information available 1 - Help information available **<numOfItems>** - number of items in the list **<titleText>** - string giving menu title **<itemId>** - item identifier 1..**<numOfItems>** **<itemText>** - title of item **<nextActionId>** - the next proactive command type to be issued upon execution of the menu item. 0 - no next action information available. *if **<cmdType>=37** (SET UP MENU)* The first line of output is: **#STGI: <cmdType>,<commandDetails>,<numOfItems>,<titleText>** **<CR><LF>** One line follows for every item, repeated for **<numOfItems>**: **#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]** where: **<commandDetails>** - unsigned Integer used as a bitfield 0..255 - used as a bit field: **bit 1**: 0 - no selection preference 1 - selection using soft key preferred **bit 2 to 7**: 0 **bit 8**: 0 - no help information available 1 - help information available **<numOfItems>** - number of items in the list **<titleText>** - string giving menu title

	<itemId> - item identifier 1..**<numOfItems>** **<itemText>** - title of item **<nextActionId>** - the next proactive command type to be issued upon execution of the menu item. 0 - no next action information available. Note: upon receiving the **#STGI** response, the TA must send **#STSR** command (see below) to confirm the execution of the proactive command and provide any required user response, e.g. selected menu item.
AT#STGI?	The read command can be used to request the currently ongoing **proactive command** and the SAT state in the format **#STGI: <state>,cmdType>** where: **<state>** - SAT interface state (see **#STIA**) **<cmdType>** - ongoing proactive command An error message will be returned if there is no pending command.
AT#STGI=?	Test command returns the range for the parameters **<state>** and **<cmdType>**.
Note	The unsolicited notification sent to the user: **#STN: 37** is an indication that the main menu of the SIM Application has been sent to the TA. It will be stored by the TA so that it can be displayed later at any time by issuing an **AT#STGI=37** command. A typical SAT session on AT interface starts after an **#STN: 37** unsolicited code is received, if enabled. At that point usually an **AT#STGI=37** command is issued, and after the SAT main menu has been displayed on TE an **AT#STSR=37,0,x** command is issued to select an item in the menu (see below). The session usually ends with a SIM action like sending an SMS, or starting a call. After this, to restart the session from the beginning going back to SAT main menu it is usually required an **AT#STSR=37,16** command. The unsolicited notification sent to the user: **#STN:237** is an indication that the main menu of the SIM Application has been removed from the TA, and it is no longer available. In this case **AT#STGI=37** command response will be always **ERROR**.

5.6.13.3. SIM Tookit Send Response - #STSR

#STSR - SIM Tookit Send Response

#STSR - SIM Tookit Send Response	
AT#STSR= **[<cmdType>,** **<userResponse>** **[,<data>]]**	The write command is used to provide to SIM user response to a command and any required user information, e.g. a selected menu item. Parameters: **<cmdType>** - integer type; **proactive command** ID according to 3GPP TS 31.114 (see **#STGI)** **<userResponse>** - action performed by the user 0 - command performed successfully (call accepted in case of call setup) 16 - proactive SIM session terminated by 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/SS Transaction terminated by user 32 - TA currently unable to process command 34 - user has denied SIM call setup request 35 - user cleared down SIM call before connection or network release **<data>** - data entered by user, depending on **<cmdType>**, only required if **<Result>** is 0: ***Get Inkey*** **<data>** contains the key pressed by the user; used character set should be the one selected with **+CSCS** Note: if, as a user response, a binary choice (Yes/No) is requested by the SIM application using bit 3 of the **<commandDetails>** parameter the valid content of the **<inputString>** is: a) “IRA”, ”8859-1”, ”PCCP437” charsets: “Y” or “y” (positive answer) and “N” or “n” (negative answer) b) UCS2 alphabet “0079” or “0059” (positive answer) and “006E” or “004E” (negative answer) ***Get Input*** **<data>** - contains the string of characters entered by the user (see above) ***Select Item*** **<data>** - contains the item identifier selected by the user Note: Use of icons is not supported. All icon related actions will respond with no icon available.
AT#STSR?	The read command can be used to request the currently ongoing **proactive command** and the SAT state in the format **#STSR: <state>,<cmdType>** where: **<state>** - SAT interface state (see **#STIA)** **<cmdType>** - ongoing proactive command

#STSR - SIM Tookit Send Response	
	An error message will be returned if there is no pending command.
AT#STSR=?	Test command returns the range for the parameters **<state>** and **<cmdType>**.

5.6.14. SAP AT Commands Set

5.6.14.1. Remote SIM Enable - #RSEN

#RSEN – Remote SIM Enable	
AT#RSEN=<mode>[, <sapformat>[, <role>[, <port>[, <beacon>]]]]	Set command is used to enable/disable the Remote SIM feature. Parameters: **<mode>** 0 - disable 1 - enable **<sapformat>** 1 - binary SAP (default) **<role>** 0 - remote SIM Client (default) 1 - remote SIM Server (unsupported) <**port**> - the port used as SAP channel; mandatory if **<mode>=1** and **<sapformat>=1** 1 - Active port **<beacon>** - retransmition timer of SAP Connection Request 0 - only one transmition (default) 1..100 - timer interval in seconds. NOTES: If the module has a SIM inserted, when it receives the enable Command: - de-register from the actual network - de-initialize the current SIM. NOTE for **<sapformat>=1** (binary SAP): while RSEN is activate SAP connection status is signalled with following URC: **#RSEN: <conn>** where **<conn>** - connection status 0 - disconnected 1 - connected
AT#RSEN?	Read command returns the connection status of Remote SIM feature
AT#RSEN=?	Test command returns all supported values of Remote SIM Enable command

5.6.15. Phonebook AT Commands Set

5.6.15.1. Delete All Phonebook Entries - #CPBD

#CPBD – Delete All Phonebook Entries	
AT#CPBD	Execution command deletes all phonebook entries in the current phonebook memory storage selected with **+CPBS**. Note: in case of SM or ME, it takes some time to delete all its entries.
AT#CPBD=?	Test command returns the OK result code.

5.6.15.2. Read Group Entries - #CPBGR

#CPBGR- Read Group Entries	
AT#CPBGR= <index1> [,<index2>]	Execution command returns Grouping information Alpha String (GAS) USIM file entries in location number range **<index1>**...**<index2>**. If **<index2>** is omitted, only location **<index1>** is returned. These strings are the names used for groups an ADN entry could belong to. Parameters: **<index1>** - integer type, value in the range of location numbers of GAS. **<index2>** - integer type, value in the range of location numbers of GAS. The response format is: **[#CPBGR: <index1>,<text>[<CR><LF>** **#CPBGR: <index2>,<text>[…]]]** where: **<index*n*>** - the location number of the GAS entry **<text>** - the alphanumeric text associated to the entry
AT#CPBGR=?	Test command returns the supported range of values for parameters **<index*n*>** and the maximum length of **<text>** field, in the format: **#CPBGR: (<minIndex> - <maxIndex>),<tlength>** where: **<minIndex>** - the minimum **<index>** number, integer type **<maxIndex>**- the maximum **<index>** number, integer type **<tlength>** - maximum **<text>** field length, integer type

5.6.15.3. Write Group Entries - #CPBGW

#CPBGW - Write Group Entry	
AT#CPBGW= <index>,<text>	Execution command writes Grouping information Alpha String (GAS) USIM file entry in location number **<index>**.

#CPBGW - Write Group Entry	
	Parameters: <**index**> - integer type, value in the range of location numbers of the GAS file. <**text**> - the text associated to the entry, string type Note: If record number <**index**> already exists, it will be overwritten.
AT#CPBGW=?	Test command returns location range supported by the current storage as a compound value, and maximum length of <**text**> field. The format is: **+CPBGW: (list of supported <index>s),<tlength>** where: <**tlength**> - integer type value indicating the maximum length of field <**text**> in bytes; actual maximum number of characters that can be stored depends upon <text> coding (see +CSCS)

5.6.16. Audio AT commands

5.6.16.1. Audio Basic configuration

5.6.16.1.1. Change Audio Path - #CAP

#CAP – Change Audio Path	
AT#CAP=<n>	It has no effect and is included only for backward compatibility. Parameter: < **n** >: (0-2) 0 - factory default
AT#CAP?	Read command returns the active audio path in the format: **#CAP: <n>**
AT#CAP=?	Test command reports the supported range of values for parameter <**n**>.

5.6.16.1.2. 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=?** 10 - factory default <**tout**> - ringing tone playing time-out in seconds.

#SRS- Select Ringer Sound	
	0 - ringer is stopped (if present) and current ringer sound is set.(factory default) 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>**

5.6.16.1.3. Select Ringer Path - #SRP

#SRP – Select Ringer Path	
AT#SRP=<n>	It has no effect and is included only for backward compatibility. Parameter: **< n >**: (0-3) 0 - factory default
AT#SRP?	Read command returns the active audio path in the format: **#SRP: <n>**
AT#SRP=?	Test command reports the supported range of values for parameter **<n >**.

5.6.16.1.4. Handsfree Microphone Gain - #HFMICG

#HFMICG - Handsfree Microphone Gain	
AT#HFMICG=	It has no effect and is included only for backward compatibility.

#HFMICG - Handsfree Microphone Gain	
<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>**
Note	LE922A6 does not support Analog Audio. And #HFMICG will be no effect.
AT#HFMICG=?	Test command returns the supported range of values of parameter **<level>**.

5.6.16.1.5. Handset Microphone Gain - #HSMICG

#HSMICG - Handset Microphone Gain	
AT#HSMICG=<level>	It has no effect and is included only for backward compatibility. Set command sets the handsfree microphone input gain Parameter: **<level>**: handsfree microphone input gain 0..7 - handsfree microphone gain (+6dB/step) (factory default = 0)
AT#HSMICG?	Read command returns the current handsfree microphone input gain, in the format: **#HSMICG: <level>**
Note	LE922A6 does not support Analog Audio. And #HSMICG will be no effect.
AT#HSMICG=?	Test command returns the supported range of values of parameter **<level>**.

5.6.16.1.6. Handsfree Receiver Gain - #HFRECG

#HFRECG - Handsfree Receiver Gain	
AT#HFRECG=<level>	It has no effect and is included only for backward compatibility. Set command sets the handsfree analogue output gain. Parameter: **<level>**: handsfree analogue output gain (factory default : 0) 0..6 - handsfree analogue output (-3dB/step) 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>**
Note	LE922A6 does not support Analog Audio. And #HFRECG will be no effect. Instead of #HFRECG, refer to #PCMRXG.

AT#HFRECG =?	Test command returns the supported range of values of parameter **<level>**.

5.6.16.1.7. Handset Receiver Gain - #HSRECG

#HSRECG - Handset Receiver Gain	
AT#HSRECG= <level>	It has no effect and is included only for backward compatibility. Set command sets the handsfree analogue output gain. Parameter: **<level>**: handsfree analogue output gain (factory default : 0) 0..6 - handsfree analogue output (-3dB/step) Note: This parameter is saved in NVM issuing AT&W command.
AT#HSRECG?	Read command returns the current handsfree analog output gain, in the format: **#HFRECG: <level>**
Note	LE922A6 does not support Analog Audio. And #HSRECG will be no effect. Instead of #HSRECG, refer to #PCMRXG.
AT#HSRECG =?	Test command returns the supported range of values of parameter **<level>**.

5.6.16.1.8. DVI Microphone Gain - #PCMTXG

#PCMTXG - DVI Microphone Gain	
AT#PCMTXG= <TX_VOL>	It has no effect and is included only for backward compatibility. Set command sets the DVI(PCM) Audio TX gain Parameter: **<TX_VOL>** : PCM TX volume in TX path (factory default: 0) TX_VOL RANGE : -5000(-50 dB) ~ 1200(+12 dB) Note: meaning of a TX_VOL is 1/100 dB step. Note : meaning of -50dB is mute
AT#PCMTXG?	Read command returns the current PCM Audio TX value: **#PCMTXG: <TX VOL>**
AT#PCMTXG=?	Test command returns the supported range of values of parameter **<TX VOL>**

5.6.16.1.9. DVI Speaker Volume Level - #PCMRXG

#PCMRXG - DVI Speaker Volume Level	
AT#PCMRXG= <RX_VOL>	Set command sets the DVI(PCM) Audio RX value. Parameter: **<RX_VOL>** : PCM RX volume in RX path RX_VOL RANGE : -5000(-50 dB) ~ 1200(+12 dB) Note: meaning of a RX_VOL is 1/100 dB step. Note**:** meaning of -50 dB is mute.

#PCMRXG - DVI Speaker Volume Level	
AT#PCMRXG?	Read command returns the current PCM Audio RX value: **#PCMRXG: <RX VOL>**
AT#PCMRXG=?	Test command returns the supported range of values of parameter **<RX VOL>**

5.6.16.1.10. Set Headset Sidetone - #SHFSD

#SHFSD - Set Handsfree Sidetone	
AT#SHFSD= <mode>	It has no effect and is included only for backward compatibility Set command enables/disables the sidetone on handsfree audio output. Parameter: **<mode>** 0 - Disables the Handsfree sidetone (factory default) 1 - Enables the Handsfree sidetone. Note: These parameters saved in NVM issuing AT&W command.
AT#SHFSD?	Read command reports whether the handsfree sidetone is currently enabled or not, and current gain level in the format: **#SHFSD: <mode>**
Note	LE922A6 does not support Analog Audio. And #SHFSD will be no effect.
AT#SHFSD=?	Test command returns the supported range of values of parameter **<mode>**

5.6.16.1.11. Set Handset Sidetone - #SHSSD

#SHSSD - Set Handset Sidetone	
AT#SHSSD= <mode>	It has no effect and is included only for backward compatibility. Set command enables/disables the sidetone on handset audio output. Parameter: **<mode>** 0 - Disables the Handset sidetone (factory default) 1 - Enables the Handset sidetone. Note: These parameters saved in NVM issuing AT&W command.
AT#SHSSD?	Read command reports whether the handset sidetone is currently enabled or not, and current gain level in the format:

#SHSSD - Set Handset Sidetone	
	#SHSSD: <mode>
Note	LE922A6 does not support Analog Audio. And #SHSSD will be no effect.
AT#SHSSD=?	Test command returns the supported range of values of parameter **<mode>.**

5.6.16.1.12. 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 speakeres 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.

5.6.16.1.13. Open Audio Loop - #OAP

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

5.6.16.2. Tones configuration

5.6.16.2.1. Signalling Tones Mode - #STM

#STM- Signalling Tones Mode	
AT#STM=	Set command enables/disables the signalling tones output on the audio path

#STM- Signalling Tones Mode	
<mode>	selected with **#SRP** command (LE922A6 support DVI only). Parameter: **<mode>** - signalling tones status 0 - Signalling tones disabled. 1 - Signalling tones enabled. (factory default) 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>**.

5.6.16.2.2. Tone Playback - #TONE

#TONE - Tone Playback	
AT#TONE=<tone> [,<duration>]	Execution command allows the playback of either a single DTMF tone or a dial tone for a specified period of time. Parameters: **<tone>** - tone to be reproduced (0-9), #, *, (A-D) - dtmf tone (G-L) - user defined tones Y - free 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>** and **<duration>**.

5.6.16.2.3. Tone Classes Volume - #TSVOL

#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

#TSVOL – Tone Classes Volume	
	16 - DTMF tones 32 - SIM Toolkit tones 64 - user defined tones 128 – Dial tones 255 - all classes **<mode>** - it indicates which volume is used for the classes of tones represented by **<class>** 0 - default volume is used (factory default) 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: 128,<mode128>[,<volume128>]**
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:128,0 OK

5.6.16.2.4. User Defined Tone SET - #UDTSET

#UDTSET – User Defined Tone SET	
AT#UDTSET= <tone>	Set command sets frequency and amplitude composition for a User Defined Tone.

#UDTSET – User Defined Tone SET	
,<F1>,<A1> [,<F2>,<A2> [,<F3>,<A3>]]	Parameters: <**tone**> - tone index (G-L) <**F*i***> - frequency in Hz (300,3000) in step of 1 Hz <**A*i***> - amplitude in dB (10,100) in step of 1 dB Note: **A*i*** and **F3** have no effect and are included only for backward compatibility.
AT#UDTSET?	Read command returns the current settings for the tones: #UDTSET: G,F1,A1,F2,A2,F3,A3 #UDTSET: H,F1,A1,F2,A2,F3,A3 #UDTSET: I,F1,A1,F2,A2,F3,A3 #UDTSET: J,F1,A1,F2,A2,F3,A3 #UDTSET: K,F1,A1,F2,A2,F3,A3 #UDTSET: L,F1,A1,F2,A2,F3,A3
AT#UDTSET =?	Test command returns the supported range of values for tones indexes, frequency and amplitude.

5.6.16.2.5. Save User Defined Tones - #UDTSAV

#UDTSAV – Save User Defined Tones	
AT#UDTSAV	Execution command saves the actual values of frequency and amplitude parameters that have been set with the command #UDTSET.
AT#UDTSAV=?	Test command returns the **OK** result code.
Example	AT#UDTSAV OK *Current tones are saved in NVM*

5.6.16.2.6. User Defined Tone Reset - #UDTRST

#UDTRST – User Defined Tone Reset	
AT#UDTRST	Execution command resets the actual values of frequency and amplitude for the user defined tones to the default set. The parameters to reset are : - G F1 A1 F2 A2 F3 A3 - H F1 A1 F2 A2 F3 A3 - I F1 A1 F2 A2 F3 A3 - J F1 A1 F2 A2 F3 A3 - K F1 A1 F2 A2 F3 A3 - L F1 A1 F2 A2 F3 A3
AT#UDTRST =?	Test command returns the **OK** result code.

5.6.16.3. Echo canceller configuration

5.6.16.3.1. Audio DSP Configuration - #ADSPC

#ADSPC – Audio DSP Configuration	
AT#ADSPC=<n> [,<ecns mode>]	Set command switches the DSP profile audio path depending on parameter <n> . Parameter: **<n>** - DSP profile configuration 0- Automatic (factory default) 1- Hands Free 2- Headset **3- Handset** 4- Speaker phone Bluetooth 5- TTY 6- USB **<ecns mode>** 0- Disables ECNS mode (factory default) 1- Enables ECNS mode Note: **LE922A6 does not support Analog Audio.** On Automatic mode: **Digital(DVI): handset** Analog: according to #CAP This command influence on the #CAP / #SRP. On Active/MT/MO Voice Call return Error. When #TTY command enabled, SET #ADSPC command return Error.
AT#ADSPC?	Read command reports the active DSP profile configuration in the format: For TTY profile: **#ADSPC: <n>** For Another DSP profile: **#ADSPC: <n>,< ecns mode >**
AT#ADSPC=?	Test command reports the supported values for the parameter <n>.
Example	For DVI only model Handset ECNS OFF : **at#adspc=0,0 or at#adspc=3,0** Handset ECNS ON : **at#adspc=0,1 or at#adspc=3,1**

5.6.16.3.2. Handsfree Echo Canceller - #SHFEC

#SHFEC - Handsfree Echo Canceller	
AT#SHFEC= <mode>	It has no effect and is included only for backward compatibility. Set command enables/disables the echo canceller function on audio handsfree. Parameter:

#SHFEC - Handsfree Echo Canceller	
	<mode> (0,1) - (0 is factory default) **Note :** Added to **#ADSPC**
AT#SHFEC?	Read command reports whether the echo canceller function on audio handset. output is currently enabled or not, in the format: **#SHFEC: <mode>**
AT#SHFEC=?	Test command returns the supported range of values of parameter **<mode>**.

5.6.16.3.3. Handset Echo Canceller - #SHSEC

#SHSEC - Handset Echo Canceller	
AT#SHSEC= <mode>	It has no effect and is included only for backward compatibility. Set command enables/disables the echo canceller function on audio handset. Parameter: **<mode>** 0 - disables echo canceller for handset mode (default) 1 - enables echo canceller for handset mode **Note :** Added to **#ADSPC**
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>**.

5.6.16.3.4. Handsfree Noise Reduction - #SHFNR

#SHFNR - Handsfree Noise Reduction	
AT#SHFNR= <mode>	It has no effect and is included only for backward compatibility. Parameter: **<mode>** (0,1) - (0 is default) **Note :** Added to **#ADSPC**
AT#SHFNR?	Read command reports whether the noise reduction function on audio handsfree input is currently enabled or not, in the format: **#SHFNR: <mode>**

#SHFNR - Handsfree Noise Reduction	
AT#SHFNR=?	Test command returns the supported range of values of parameter **<mode>.**

5.6.16.3.5. Handset Noise Reduction - #SHSNR

#SHSNR - Handset Noise Reduction	
AT#SHSNR=<mode>	It has no effect and is included only for backward compatibility. Parameter: **<mode>** 0 - disables noise reduction for handset mode (default) 1 - enables noise reduction for handset mode **Note :** Added to **#ADSPC**
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>.**

5.6.16.4. DTMF

#DTMF – Embedded DTMF decoder enabling	
AT#DTMF=<mode>	Set command enables/disables the embedded DTMF decoder. Parameters: **<mode>:** 0 – disable DTMF decoder (default) 1 – enables DTMF decoder 2 – enables DTMF decoder without URC notify Note: if **<mode>**=1, the receiving of a DTMF tone is pointed out with an unsolicited message through AT interface in the following format: #DTMFEV: x with x as the DTMF digit Note: the duration of a tone should be not less than 50ms. Note: the value set by command is not saved and a software or hardware reset restores the default value. The value can be stored in NVM using profiles.
AT#DTMF?	Read command reports the currently selected **<mode>** in the format:

	#DTMF: <mode>
AT#DTMF =?	Test command reports supported range of values for all parameters.

5.6.16.5. DVI

5.6.16.5.1. Digital Voiceband Interface - #DVI

#DVI - Digital Voiceband Interface	
AT#DVI=<mode> [,<dviport>, <clockmode>]	Set command enables/disables the Digital Voiceband Interface. Parameters: **<mode>** - enables/disables the DVI. 0 - disable DVI; (Not used in DVI only) 1 - enable DVI; audio is forwarded to the DVI block (factory default) 2 - reserved **<dviport>** 1 - reserved 2 - DVI port 2 will be used (factory default) **<clockmode>** 0 - DVI slave 1 - DVI master (factory default) Note: LE922A6 doesn't include internal analog line. (only DVI) LE922A6 supported by "DVI master" only. The parameters have no effect and are included only for backward compatibility. On Active/MT/MO Voice Call return Error.
AT#DVI?	Read command reports last setting, in the format: **#DVI: <mode>,<dviport>,<clockmode>**
AT#DVI=?	Test command reports the range of supported values for parameters **<mode>,<dviport>** and **<clockmode>**
Example	AT#DVI=1,2,1 OK *DVI activated for audio. DVI is configured as master providing on DVI Port #2 (the only available)*

5.6.16.5.2. Digital Voiceband Interface Configuration - #DVICFG

#DVICFG - Digital Voiceband Interface configuration	
AT#DVICFG=[<clock>[,<decoder pad>[,<decoder	Set command sets the DVI configuration Parameter:

#DVICFG - Digital Voiceband Interface configuration	
format>[, <encoder pad>[,<encoder format>]]]]]	**<clock>** Clock speed for master mode 0 : normal mode(factory default) 1 : high speed mode **<decoder pad>** PCM padding enable in decoder path 0 : disable 1 : enable(factory default) **<decoder format>** PCM format in decoder path 0 : u-Law 1 : A-Law 2 : linear(factory default) **<encoder pad>** PCM padding enable in encoder path 0 : disable 1 : enable(factory default) **<encoder format>** PCM format in encoder path 0 : u-Law 1 : A-Law 2 : linear(factory default) Note: #DVICFG command is blocked when #DVICLK is active. #DVICFG parameters are saved in the extended profile. LE922A6 only supported by first parameter <clock> - Normal mode (factory default) = 2048KHz with sample rate 8k. - High speed mode = 4096KHz with sample rate 16k. Another parameters (**<decoder pad>, <decoder format>, <encoder pad>, <encoder format>**) have no effect and are included only for backward compatibility
AT#DVICFG?	Read command reports last setting, in the format: **#DVICFG: <clock>,<decoder pad>,<decoder format>,<encoder pad>,<encoder format>**.
AT#DVICFG=?	Test command returns the supported range of values of parameter **<clock>, <decoder pad>, <decoder format>, <encoder pad>, <encoder format>**.

5.6.16.5.3. Digital Voiceband Interface Clock Activation - #DVICLK

#DVICLK - Digital Voiceband Interface Clock Activation	
AT#DVICLK= <clock>[,<samplerate >]	Set command configures and activates the DVICLK clock signal. Parameter: **<clock>** 0 : Disable (factory default) 1 : DVI Clock activated at 512KHz 2 : DVI Clock activated at 1024KHz 3 : DVI Clock activated at 2048KHz

#DVICLK - Digital Voiceband Interface Clock Activation	
	<samplerate> 0 : 8KHz (factory default) 1 : 16KHz Note: The commands #DVI, #DVICFG, #OAP can turn off the DVICLK signal or change its frequency. After setting the DVICLK frequency through #DVICLK command, a voice call doesn't modify the DVICLK setting.
AT#DVICLK?	Read command reports last setting, in the format: **#DVICLK: <clk>,<samplerate>**
AT#DVICLK=?	Test command reports the range of parameter **<clk>,<samplerate>**

5.6.16.6. Miscellaneous audio commands

5.6.16.6.1. TeleType Writer - #TTY

#TTY - TeleType Writer	
AT#TTY=<support>	Set command enables/disables the TTY functionality. Parameter: **<support>** 0- Disable TTY functionality.(factory default) 1- Enable Full TTY mode. 2- Enable VCO mode (Voice Carry Over). 3- Enable HCO mode (Hearing Carry Over) Note: Enabling this command, blocked #ADSPC set command. The value set by command is directly stored in NVM and doesn't depend on the specific AT instance. On Active/MT/MO Voice Call return Error.
AT#TTY?	Read command returns the currently TTY mode, in the format: **#TTY: <support>**
AT#TTY=?	Test command reports the supported range of values for parameter **<support>**.

5.6.17. Audio File Management and Play

5.6.17.1. Audio available size - #ASIZE

#ASIZE – Audio available size

AT#ASIZE	This command shows residual space in bytes available to store audio files on the Linux FS(/etc/sound/aplay) The response format is: #ASIZE: <total size>,<used size>,<free size>
AT#ASIZE=?	Test command returns the OK result code

5.6.17.2. List audio file - #ALIST

#ALIST – List audio file	
AT#ALIST	This command lists all audio files stored on the on the Linux FS(/etc/sound/aplay) The response format is: #ALIST: <filename>,<filesize>,<crc>**<CR><LF>** Parameter: **<filename>** - file name, string type Allowed extensions for <filename>: • pcm or no extension – the audio supported format is PCM raw data • wav – the audio supported format is RIFF/WAVE File Format <**filesize**> - file size in bytes <**crc**> - CRC16 poly (x^16+x^12+x^5+1) of file in hex format Note: CRC16 is calculated using the standard CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation) with initial value FFFF. Note: if one file currently stored in efs is in use, then CRC16 cannot be calculated and execution command does not report <crc> for that file. Note: CRC calculation time depends on file size. If one filesize is large, Return-time spends a little more time.
AT#ALIST=?	Test command returns the OK result code

5.6.17.3. Delete audio file - #ADELF

#ADELF – Delete audio file	
AT#ADELF=<filename>	This command deletes a specific audio file on the Linux FS(/etc/sound/aplay) Parameter: <**filename**> - file name, string type Allowed extensions for <filename>:

	• pcm or no extension – the audio supported format is PCM raw data • wav – the audio supported format is RIFF/WAVE File Format Note: filename has a maximum of 32 characters.
AT#ADELF=?	Test command returns the OK result code

5.6.17.4. Delete all audio files - #ADELA

#ADELA – Delete all audio files	
AT#ADELA	This command deletes all audio files on the Linux FS(/etc/sound/aplay)
AT#ADELA=?	Test command returns the OK result code

5.6.17.5. Send an audio file - #ASEND

#ASEND – Send an audio file	
AT#ASEND= <filename>,<filesize>	This command allows user to send an audio file to serial port and store it on the Linux FS(/etc/sound/aplay) Parameters: <**filename**> - file name, string type Allowed extensions for <filename>: • pcm or no extension – the audio supported format is PCM raw data • wav – the audio supported format is RIFF/WAVE File Format <**filesize**> - file size in bytes The URC format is: **#ASENDEV: <result>** Where: **<result>** 0 – pcm storing done 1 – pcm storing error Note: in case Storing is completed or an error occurs, URC is received. Note: filename has a maximum of 32 characters. Note: The total size of all audio files must not be over <total size> in #ASIZE Note: The file should be sent using RAW ASCII file transfer. the flow control is set to hardware and baudrate is set to 115200 bps in the UART port settings. Note: it's not allowed for TE to use two or more serial ports as DATA service (DUN and asend) simultaneously.
AT#ASEND=?	Test command returns the OK result code
Example	AT#ASEND=<filename>,<filesize>

#ASEND – Send an audio file	
	CONNECT Note: after the CONNECT, an audio file has to be sent to serial port

5.6.17.6. Receive an audio file - #ARECV

#ARECV – Receive an audio file	
AT#ARECV= <filename>	This command allows user to receive an audio file stored on the Linux FS(/etc/sound/aplay) Parameters: <**filename**> - file name, string type Allowed extensions for <filename>: • pcm or no extension – the audio supported format is PCM raw data • wav – the audio supported format is RIFF/WAVE File Format Note: The file should be sent using RAW ASCII file transfer. the flow control is set to hardware and baudrate is set to 115200 bps in the UART port settings. Note: it's not allowed for TE to use two or more serial ports as DATA service (DUN and arecv) simultaneously.
AT#ARECV=?	Test command returns the OK result code
Example	AT#ARECV=<filename> CONNECT Note: after the CONNECT, an audio file has to be received from serial port

5.6.17.7. Record an audio file - #ARECD

#ARECD – Record an audio file	
AT#ARECD= <mode>[,<filename>]	This command records speech data coming from microphone The recorded file is located at the Linux FS(/etc/sound/aplay) Parameter: <mode> 0 - stop to record(default value) 1 - start to record in case the same filename doesn't exist 2 - start to record after deleting the existed file <filename> - file name, string type Allowed extensions for <filename>: • pcm or no extension • wav The URC format is:

	#ARECDEV: <result> Where: <result> 0 –record done 1 –record error Note: filename parameter is ignored in case <mode> is 0. Note: in case recording stops because memory is full or an error occurs, URC is received. Note: filename has a maximum of 32 characters. Note: The total size of all audio files must not be over <total size> in #ASIZE Note: Only 8kHz sample rate is supported.
AT#ARECD?	Read command reports the currently selected **<mode>** in the format: **#ARECD: <mode>**
AT#ARECD=?	Test command reports the supported range of values for the parameters <mode> in the format:

5.6.17.8. Play an audio file - #APLAY

#APLAY – Play an audio file	
AT#APLAY=<mode>[,<dir>,<filename>]	This command plays PCM audio file on the Linux FS(/etc/sound/aplay) to the speaker or uplink path. Parameters: <mode> 0 - stop to play, Optional parameters are ignored (default value) 1 - start to play, Optional parameters are mandatory <dir>: select audio path. 0 - send to the speaker(default value) 1 - send to the uplink path <filename> - file name, string type Allowed extensions for <filename>: • pcm or no extension – the audio supported format is PCM raw data • wav – the audio supported format is RIFF/WAVE File Format The URC format is: **#APLAYEV: <result>** Where: **<result>** 0 –play done 1 –play error

AT#APLAY?	Read command reports the currently selected **<mode>,<dir>** in the format: **#APLAY: <mode>,<dir>**
AT#APLAY=?	Test command reports the supported range of values for the parameters <mode>,<dir> in the format.

5.6.17.9. Find audio file - #AFIND

#AFIND – Find a specific audio file	
AT#AFIND= <filename>	This command finds a specific audio file on the linux FS(/etc/sound/aplay) Parameter: <**filename**> - file name, string type Allowed extensions for <filename>: • pcm or no extension – the audio supported format is PCM raw data • wav – the audio supported format is RIFF/WAVE File Format Note: filename has a maximum of 32 characters.
AT#AFIND=?	Test command returns the OK result code

5.6.18. Emergency call Management

5.6.18.1. Dial an emergency call - #EMRGD

#EMRGD – dial an emergency call	
AT#EMRGD[=<par>]	This command initiates an emergency call. Parameters: <par>: 0 - initiates an emergency call without specifying the Service Category. (default value) 1..31 - sum of integers each representing a specific Emergency Service Category: 1 - Police 2 - Ambulance 4 - Fire Brigade 8 - Marine Guard 16 - Mountain Rescue 32 - Manually Initiated eCall 64 - Automatically Initiated eCall When the emergency call can initiate, an indication of the Service Category selected is shown before the OK in the following format: **#EMRGD: <serv>[,<serv>..[,<serv>]]**

#EMRGD – dial an emergency call	
	Where **<serv>** “Police” “Ambul” “FireBrig” “MarineGuard” “MountRescue” “MIeC” “AIeC” Example: **AT#EMRGD=17** **#EMRGD: “Police”,“MountRescue”** **OK**
AT#EMRGD	The execution command initiates an emergency call without specifying the Service Category.
AT#EMRGD?	The read command reports the emergency numbers received from the network (Rel5 feature) and the associated service categories in the format: **[#EMRGD:<num1>[,<par1>,<serv>[,<serv>..[,<serv>]]]** **[#EMRGD:<num*n*>[,<par*n*>,<serv>[,<serv>..[,<serv>]]]** Where **<num*n*>** Is the emergency number (that can be dialled with ATD command). **<par*n*>** 1..31 - sum of integers each representing a specific Emergency Service Category: 1 - Police 2 - Ambulance 4 - Fire Brigade 8 - Marine Guard 16 - Mountain Rescue 32 - Manually Initiated eCall 64 - Automatically Initiated eCall Example: AT#EMRGD? #EMRGD: 123,2,“Ambul” #EMRGD: 910,5, “Police”,“FireBrig” OK
AT#EMRGD=?	Test command reports the supported range of values for parameter **<par>**.

5.6.18.2. Network Emergency Number Update - #NWEN

#NWEN - Network Emergency Number Update	
AT#NWEN=[<en>]	Set command enables/disables URC of emergency number update. Parameters: **<en>** 0 - disables URC of emergency number update (factory default) 1 - enables URC of emergency number update **#NWEN: <type>** where: <type> 1 - number list update from internal ME 2 - number list update from SIM 3 - number list update from network Note: **<en>** is saved in NVM.
AT#NWEN?	Read command reports whether URC of network emergency number update is currently enabled or not: **#NWEN: <en>**
AT#NWEN=?	Test command returns supported values of parameter **<en>**

5.6.19. Advanced Encryption Standard AT commands

5.6.19.1. Load the security data - #AESSECDATA

#AESSECDATA – Load the security data	
AT#AESSECDATA=<Action>[,<Size>]	Execution command allows to store, delete and read security data AES key into NVM. Parameters: **<Action>** - Action to do 0 – Delete data from NVM. 1 – Store data into NVM. 2 – Get MD5 digest of data into NVM. **<Size>** - Size of AES key to be stored Admitted values: - 16 number of bytes used for AES128 - 24 number of bytes used for AES192 - 32 number of bytes used for AES256 If the **<Action>** parameter is 1(store data into NVM) the device responds to the

#AESSECDATA – Load the security data	
	command with the prompt '>' and waits for the data to store. When **<Size>** 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: **<Size>** parameter is mandatory if the store action is issued, but it has to be omitted for delete or get actions are issued.
AT#AESSECDATA?	Read command return the present of security data in NVM. **#AESSECDATA: <AESKeyIsSet>** **<AESKeyIsSet>** is 1 if related data are stored into NVM otherwise 0.
AT#AESSECDATA=?	Test command returns the range of supported values for all the paramters.

5.6.19.2. Encrypt data - #AESENCRYPT

#AESENCRYPT – Encrypt data	
AT#AESENCRYPT	Execution command encrypts data with AES algorithm. **The device responds to the command with the prompt '>' <greater_than><space> and waits for the data to send.** When 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: the command accept only 1 block of 16 bytes. Note: if AES key isn't loaded the command returns error.
AT#AESENCRYPT=?	Test command returns the number of bytes to be sent after the prompt. **#AESENCRYPT: (16)** If AES key isn't loaded the command returns: **#AESENCRYPT: (0)**

5.6.19.3. Decrypt data - #AESDECRYPT

#AESDECRYPT – Decrypt data	
AT#AESDECRYPT	Execution command decrypts data with AES algorithm. **The device responds to the command with the prompt '>'**

#AESDECRYPT – Decrypt data	
	<greater_than><space> and waits for the data to send. When 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: the command accept only 1 block of 16 bytes. Note: if AES key isn't loaded the command returns error.
AT#AESDECRYPT=?	Test command returns the number of bytes to be sent after the prompt. **#AESDECRYPT: (16)** If AES key isn't loaded the command returns: **#AESDECRYPT: (0)**

5.6.19.4. Result of AES calculation – #AESGETRESULT

#AESGETRESULT – Result of AES calculation	
AT#AESGETRESULT	Execution command reads calculated data, result of AES encrypt or decrypt. Note: If the AES algorithm is idle or working mode, then the command returns ERROR.
AT#AESGETRESULT?	Read command returns the state of AES encrypt of decrypt previously given. **#AESGETRESULT: <ResultAES>** Where **<ResultAES>** can assume the following values: 0 : idle or working mode 1 : AES encrypt/decrypt finished
AT#AESGETRESULT=?	Test command returns OK result code

5.6.20. ECM/RNDIS commands

Execution commands can only use when USB is connected.

5.6.20.1. DISCONNECT/CONNECT - #ICMCONNECT

#ICMCONNECT – Establish data call for 1 or 2 APN with IPv4	
AT#ICMCONNECT=<Cid>,<Connection>	This command establishes data call, referring to the PDP profile specified by the Cid and makes it possible that RNDIS or ECM could bind the activated data service and have an access to external internet.

#ICMCONNECT – Establish data call for 1 or 2 APN with IPv4	
	Parameters: <**Cid**> : PDP profile identifier 1-5 <**Connection**> 0: disconnect 1: connect Note: This command activates a specified PDP context, so all necessary operations have to be done before issuing the command (registration, APN). Note: OK of result code does not means device is connected or disconnected successfully. User should read connection state with read command. Note: Error is returned if profile is not valid. Refer to +CDGCONT to set profile. Note: Only one APN can bring up when VLAN tagged mode is disabled or CID is not listed in VLAN list. The Cid is saved at primary profile for #ICMWANCFG. Note: VLAN interface is used to data transfer if Cid is listed in VLAN list and VLAN tagged mode is enable. Otherwise, RNDIS interface is used. The Cid is saved at secondary profile for #ICMWANCFG. Note: Under tagged mode, the 2nd pair of Cid and State shows by read command.
AT#ICMCONNECT?	Read command returns the session state in the following format: **#ICMCONNECT: <Cid>,<State>** **#ICMCONNECT: <Cid>,<State>** **OK** where **<State>** can be: 0 - disconnected 1 - connected Ex) AT#ICMCONNECT? #ICMCONNECT: 1,0 OK Note: Cids (1, 2) are default by #ICMWANCFG. Default response is #ICMCONNECT: 1,0

#ICMCONNECT – Establish data call for 1 or 2 APN with IPv4	
	OK Note : VLAN tagged mode is enabled #ICMCONNECT: 1,0 #ICMCONNECT: 2,0 OK
AT#ICMCONNECT=?	Test command returns the range of supported values for all the parameters. AT#ICMCONNECT=? #ICMCONNECT: (1-5),(0,1) OK

5.6.20.2. LAN configuration - #ICMLANCFG

#ICMLANCFG – Configure LAN Setting	
AT#ICMLANCFG=<GWIPAddress>,<SubNetMask>[,<DHCP>,<Start_IPaddress>,<End_IPaddress>[,<lease_time>]]	This command is intended to set LAN configuration IP for gateway, subnet mask, enable/disable DHCP and DHCP ip address. TE is assigned local IP and gateway by DHCP server that IP range is set this command even if there is no activate PDP context. Parameters: seconds **<GWIPAddress>**: gateway IP address inside AP to support routing. 192.168.225.1 (default) - any valid IP address in the format: “xxx.xxx.xxx.xxx” **<SubNetMask>**: Subnet mask for gateway to route intranet and internet. 255.255.255.0 (default) - any valid IP address in the format: “xxx.xxx.xxx.xxx” **<DHCP state>**: DHCP server assigns IP address for RNDIS/ECM 1 - enable (default) **<Start_IPaddress>**: Start IP address to be used by DHCP server to assign private IP for RNDIS/ECM 192.168.225.11 (default) - any valid IP address in the format: “xxx.xxx.xxx.xxx” **<End_IPaddress>**: End IP address to be used by DHCP server to assign private IP for RNDIS/ECM 192.168.225.20 (default) - any valid IP address in the format: “xxx.xxx.xxx.xxx” **<lease_time>**: lease time for maintaining IP address is assigned by DHCP. Device will be reassigned as expired lease time(seconds). 2592000 (default)

#ICMLANCFG – Configure LAN Setting	
	120 – 2592000 Note:Start_IPaddress and End_IPaddress should be assigned same subnet as GWIPaddress. Otherwise, module repsonses Error. Start_IPaddress and End_IPaddress is assigned same subnet IP by module if no issuing. If GWIPaddres is x.x.x.1, then Start_IPaddress is x.x.x.11 and End_IPaddress is x.x.x.20. Note: IP and GW address of Secondary interface (USB VLAN) is assigned 192.168.224.1 that 3rd byte is one less than primary. Start IP and End IP address is same as IP. Primary GW is 192.168.0.1. then Secondary Gw is 192.168.255.1
AT#ICMLANCFG?	Read command returns the values in the following format: **#ICMLANCFG: <GWIPAddress>,<SubNetMask>,<DHCP>,<Start_IPaddress>,<End_IPaddress>,<lease_time>** **OK** Ex) AT#ICMLANCFG? #ICMLANCFG: 200,30,3600,60,0 OK
AT#ICMLANCFG=?	Test command returns the range of supported values for all the parameters. AT#ICMLANCFG=? #ICMLANCFG: ,,(1),,,(120-2592000) OK

5.6.20.3. Wireless Access Network configuration -#ICMWANCFG

#ICMWANCFG – Configure WAN Setting	
AT#ICMWANCFG=<autoconnection>[,<Roaming>[,<Profile_ID1>[,<Profile_ID2>]]]	Set WAN(Wireless Access Network) configuration for Profile_ID(Cid), auto connect and Roaming. If set enable autoconnection , active PDP context with using Profiles that set this command. PDP context is already opened by other command(#SGACT), then can access internet without activating PDP context. Parameters: seconds < **autoconnection** >: set autoconnection(#ICMAUTOCONN) 0 - disable auto connection (default) 1 - enable auto connection < **Roaming** >: restrict or allow data call in Roaming area

#ICMWANCFG – Configure WAN Setting	
	0 - disable (default) 1 - enable < **Profile_ID1**>: set primary profile id(Cid) to use connect on VLAN tagged mode or untagged mode. (#ICMCONNECT or Auto connection is enabled) – this is used to set profile # for RNDIS interface. 1 - default 2 - 5 < **Profile_ID2**>: set secondary profile id(Cid) to use connect for VLAN tagged mode. (#ICMCONNECT or Auto connect is enabled) – this is used to set profile # for VLAN interface when VLAN tagged mode is enabled. The Cid is used in pair of VLAN list (#VLANLIST). 1 2 - default 3 - 5 Note: When <**autoconnection**> set enable, device will activate PDP context automatically if network is available to connect. So, connection state will be changed "connected" that read command for #ICMCONNECT is 1.1. Note: Profile ID can be set as Profile is valid. Note: primary and secondary profiles should be different.
AT#ICMWANCFG?	Read command returns the values in the following format: **# ICMWANCFG: <autoconnection>,<Roaming>,< Profile_ID1>,< Profile_ID2>** **OK** Ex) AT#ICMWANCFG? #ICMWANCFG: 0,0,1,2 OK
AT#ICMWANCFG=?	Test command returns the range of supported values for all the parameters. AT#ICMWANCFG=? #ICMWANCFG: (0,1),(0,1),(1-16),(1-16) OK

5.6.20.4. Set Auto connection - #ICMAUTOCONN

#ICMAUTOCONN – setup data call for APN1 and APN2 automatically	
AT#ICMAUTOCONN= <autoconnection>	This command is intended to setup data call automatically to external internet through RNDIS or ECM when device boots up and get available system or set enable auto connection in available system. If set enable auto connetion , active PDP context with using Profile that is set by #ICMWANCFG command. The PDP context is already opened by other command(#SGACT), then TE is used same PDN without activating PDP

#ICMAUTOCONN – setup data call for APN1 and APN2 automatically	
	context. This command is same functionality with 1st argument for #ICMWANCFG Parameters: <**autoconnection**> : 0 - disable auto connection (default) 1 - enable auto connection Note: When <**auto connection**> set enable, device will activate PDP context automatically if network is available to connect. So, connection state will be changed "connected" that read command for #ICMCONNECT is 1,1. Note: This command activates the PDP context, so all necessary setup has to be done before it (registration, APN). Note:Under VLAN tagged mode and second Cid of #ICMWANCFG is included in VLAN list, both APNs in #ICMWANCFG is connected. Otherwise, first APN is only connected.
AT#ICMAUTOCONN?	Read command returns the session state in the following format: **#ICMAUTOCONN: < autoconnection >** **OK** where **< autoconnection >** can be: 0 – disabled auto connection 1 – enabled auto connection ex) AT#ICMAUTOCONN? #ICMAUTOCONN: 0 OK
AT#ICMAUTOCONN=?	Test command returns the range of supported values for all the parameters. AT#ICMAUTOCONN=? #ICMAUTOCONN: (0,1) OK

5.6.20.5. Set CID, VLAN ID - #VLANLIST

#VLANLIST – To add or remove a pair of CID and VLAN ID	
AT#VLANLIST=<Cmd>,<Cid>,<VLAN_ID>	Set command to configure or delete a pair of CID and VLAN ID in its own internal list. Data connection by opening CID is used VLAN interface. Parameters: **<Cmd>:** set or delete command 1 - add 2 - remove

#VLANLIST – To add or remove a pair of CID and VLAN ID	
	<Cid>: Profile ID. The paired VLAN is routed to the network interface indicated by the ID when the corresponding PDP is activated and VLAN tagged mode is enabled 1 – 5 **<VLAN_ID>:** Identifier for added virtual LAN over RNDIS interface. 0 2 - 4095: (1 is reserved with Linux system) Note: Cid is Profile# that is created by +CGDCONT. Refer to +CGDCON. If Profile is not valid, it is not added in list. Cid should be matched with 4th argument of #ICMWANCFG that profile number is using VLAN interface when tagged mode is enabled. VLAN list can not add if it is not matched. If secondary Cid is changed by #ICMWANCFG, Cid of pair for VLAN list should be changed to use VLAN interface with tagged mode. Note: It is required to add VLAN list prior to VLANTAGGED command executed and then VLAN tag mode enabled. And it is effected after reboot. Note: This command is working without USB connection.
AT#VLANLIST?	Read command show the current option values in the following format: #VLANLIST: **<Cid>,<VLAN_ID>** ex) AT#VLANLIST? #VLANLIST: 2,4000 OK
AT#VLANLIST=?	Test command returns the list of the supported values. AT#VLANLIST=? #VLANLIST: (1,2),(1-5),(0,2-4095) OK

5.6.20.6. Set VLAN mode over RNDIS - #VLANTAGGED

#VLANTAGGED – To set or read VLAN mode	
AT#VLANTAGGED=<mode>	The set command to configure VLAN mode over RNDIS Parameters: **<mode>:** 0 : disable (default) 1 : enable Note: It is required to configure the VLAN list by #VLANLIST command before enabling the VLAN tag mode with this command. Otherwise, the

#VLANTAGGED – To set or read VLAN mode	
	module could not create VLAN interface over RNDIS Note: It is needed to power recycle the module to make VLAN tag mode effective after issuing the command Note: Under untagged mode, only supports 1 network interface and 1 APN over RNDIS. Note: This command is working without USB connection.
AT#VLANTAGGED?	Read command shows the current configuration in the following format: **#VLANTAGGED: <mode>** ex) AT#VLANTAGGED? #VLANTAGGED: 1 OK
AT#VLANTAGGED =?	Test command returns the list of the supported values. AT#VLANTAGGED=? #VLANTAGGED: (0,1) OK

6. AT parser abort

The following AT Command list can be aborted, while executing the AT Command

ATD
ATA
+CLCC
+CMGS
+CMSS
+COPN
+COPS(Accept only test command)
+CLIP
+CLIR
+COLP
+CDIP
+CPOL

NOTE: If DTE transmit any character before receiving the response to the issued AT Command, this make current AT Command to be aborted.

7. List of acronyms

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
DNS	Domain Name System Server
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Fraquency
DTR	Data Terminal Ready
GPRS	Global Packet Radio Service
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
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

8. Document History

Revision	Date	Changes
0	2016-06-29	Initial version