LE920A4/LE910C1
AT Commands Reference Guide

80490ST10778A Rev.2 - 2017-04-18

Making machines talk.

APPLICABILITY TABLE

PRODUCT
LE920A4-NA
LE920A4-EU
LE920A4-CN
LE910C1-NA
LE910C1-AP
LE910C1-NS

Contents

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Such changes will, nevertheless be incorporated into new editions of this document.

1 Introduction

1.1 Scope

This document aims at 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
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Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.
Telit appreciates feedback from the users of our information.

1.4 Document Organization

This document contains the following chapters:

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

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

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

1.5 Text Conventions

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

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

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

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

1.6 Related Documents

- ETSI GSM 07.07 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/07_series/07.07/
- ETSI GSM 07.05 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/07_series/07.05/
- Hayes standard AT command set

1.7 Document History

Revision	Date	SW release	Changes
ISSUE #1	2016-09-01	25.00.xx0-Bxx	Updated command: +GCAP, #RFSTS, +CGCONTRDP, +CGEQMIN, +CGEQREQ, +CFUN, #CLKSRC, #BND, #GPIO, $GPSACP, #ADELA, #FRATTRIGGER, #ACDB New commands: #ADELF, #ADELA, #ALIST, #ASIZE, #CLKSRC, #SRSEXT, #ASEND
ISSUE #2	2017-04-18	25.00.xx0-B057	Updated command: +CGDCONT, $GPSACP, +CIREG, +CIREG, #SCFGEXT3, #TTY, #HSGS, #GPIO, +VTD, #CODECINFO, +CBST, #MONI, #RXDIV, #HSGS, +CBST, +CHLD, +CLCC, +CGDCONT, #BND, #ECMC, #CEERNET, $GPSNMUNEX, #WLANCONNECT, +CLCK, +CLVL, #HFMICG, $LCSLUI, #PLMNMODE, #WLANSECURITY, #WLANPC, WLANMACMODE, $GPSSLSR, #TEMPCFG, #V24CFG, #V24, #GPIO, #WLANSECURITY, S8, D New commands: #BRCSFB, #SWREADYEN, #SDOMAIN

2 Overview

2.1 About the document

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

3 AT COMMANDS

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

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. ETSI GSM 07.07 specific AT command and GPRS specific commands.
3. ETSI GSM 07.05 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)
4. FAX Class 1 compatible commands

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

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

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

3.2 AT Command Syntax

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

[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.

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

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

  Action commands do not store the values of any of their possible subparameters.

  Moreover:
  - The response to the Test Command (trailing **=?**) may be changed in the future by Telit to allow the description of new values/functionalities
  - If all the subparameters of a parameter type command **+CMD** (or **#CMD** or **$CMD**) are optional, issuing **AT+CMD=<CR>** (or **AT#CMD=<CR>** or **AT$CMD=<CR>**) causes the **OK** result code to be returned and the previous values of the omitted subparameters to be retained.

3.2.1 String Type Parameters

A string must be enclosed between quotes or it will not be considered as 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 on 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 always requires writing the input string parameters within quotes. This is explicitly reported in the specific descriptions.

3.2.2 Command Lines

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

The **command line prefix** consists of the characters "**AT**" or "**at**", or, to repeat the execution of the previous command line, the characters "**A/**" or "**a/**".

The **termination character** may be selected by a user option (parameter S3), the default being **<CR>**.
The basic structures of the command line are:

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

These commands might be performed in a single command line as shown below:
ATCMD1 CMD2=10+CMD1;+CMD2=, ,10;+CMD1?;+CMD1=?<CR>

Anyway it is always preferable to separate into different command lines the basic commands and the extended commands.
Furthermore it is suggested to avoid placing several action 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 have been performed successfully, result code **<CR><LF>OK<CR><LF>** is sent from the TA to the TE.
If subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code **<CR><LF>ERROR<CR><LF>** is sent and no subsequent commands in the command line are processed.

If command **V0** is enabled (numeric responses codes) and all commands in a command line have 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 below 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
770	SIM invalid
GPRS related errors to a failure to perform an Attach:	
103	Illegal MS (#3)*

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

*(Values in parentheses are 3gpp TS 24.008 cause codes) Message Service Failure Result Code - +CMS ERROR: <err>

3.2.3.1 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 below table:

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

3.2.4 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 two other 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 are 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

3.2.5 Command Response Time-Out

Every command issued to the Telit modules return 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 for which the 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	30
+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 delay between to nes, default duration)
+CSCA	5 (read and set commands)
+CSAS	5
+CMGS	120 after CTRL-Z; 1 to get ‘>’ prompt
+CMSS	120 after CTRL-Z; 1 to get ‘>’ prompt
+CMGW	5 after CTRL-Z; 1 to get ‘>’ prompt
+CMGD	5 (single SMS cancellation) 25 (cancellation of 50 SMS)
+CNMA	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	30
+CHUP	60
+COPN	10
+COPL	180 (**Currently not supported by LE9x0**)
+CRSM	180
+FRH	Timeout set with ATS7
+FTH	Timeout set with ATS7
+FRM	Timeout set with ATS7
+FTM	Timeout set with ATS7
+FRS	Timeout set with the command itself
+FTS	Timeout set with the command itself
+WS46	10
#MBN	10
#MSCLASS	15
#GPRS	150

#SKTD	140 (DNS resolution + timeout set with AT#SKTCT)
#SKTOP	290 (context activation + DNS resolution + timeout set with AT#SKTCT)
#QDNS	170
#SGACT	150
#SH	10
#SD	140 (DNS resolution + connection timeout set with AT#SCFG)

3.2.6 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 must be respected.
During command mode, due to hardware limitations, under severe CPU load, the serial port can loose some characters if placed in autobauding at high speeds. Therefore, if you encounter this problem fix the baud rate with **+IPR** command.

3.3 Storage

3.3.1 Factory Profile and User Profiles

The Telit wireless modules store the values set by several commands in the internal non-volatile memory (NVM), allowing to remember these settings 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 present historically and one that is saved and restored on early release of the code, and the **extended section** that includes all the remaining values.

&W command is used to save the actual values of **both sections** of profiles into the NVM user profile.
Commands **&Y** and **&P** are both used to set the profile to be loaded at startup. **&Y** instructs the device to load at startup only the **base section**. **&P** instructs the device to load at startup the full profile: **base + extended sections**.
The **&F** command resets to factory profile values only the commands 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**, **#VAUXSAV**, **#SKTSAV**, **#ESAV**). All of these values are read at power-up.

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

GSM DATA MODE :	**+CBST**
AUTOBAUD :	**+IPR**
COMMAND ECHO:	**E**
RESULT MESSAGES:	**Q**
VERBOSE MESSAGES:	**V**
EXTENDED MESSAGES:	**X**
FLOW CONTROL OPTIONS:	**+IFC**
DSR (C107) OPTIONS:	**&S**
DTR (C108) OPTIONS:	**&D**
DCD (C109) OPTIONS:	**&C**
POWER SAVING:	**+CFUN**
S REGISTERS:	**S0;S1;S2;S3;S4;S5;S7;S12;S25;S30;S38**
NOTIFICATION PORT:	**#NOPT**
STANDARD FLOW CONTROL:	**\Q**
FLOW CONTROL:	**&K**
RING (RI) CONTROL:	**\R**
FLOW CONTROL SPECIFIED BY TYPE:	**+FLO**
CHARACTER FORMAT:	**+ICF**

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

+FCLASS, +ILRR, +DR, +CSCS, +CR, +CRC, +CSNS, +CVHU, +CSTF, +CSDF, +CREG, #CFF, +CCWA, +CAOC, +CMER, +CRSL, +CSVM, +CMEE, +VTD, +CGEREP, +CGREG, #CESTHLCK, +CMGF, +CEREG, +CSDH, +CPNER, +CNMI, #CSCSEXT, #HSGS, #CODEC, #CODECINFO, #PSEL, #E2SMSRI, #PSNT, #QSS, #NCIH, #ACAL, #SMOV, #MWI, #SKIPESC, #E2ESC, #SIMDET, #CFLO, #PSMRI, #E2SLRI, #STIA, #SIMPR, #ECALL, #ECAM,+ CIND, #ACALEXT, #NITZ, +CLIP, +CLIR, +CIND, +CPBS, +CLVL, +CMUT, +CSIL, #DTMF, #HFMICG, #HFRECG, #STM, #ADSPC, #PCMRXG, #DVICFG, #SPKMUT, #SRS, #TSVOL, #SHFSD, #SHSSD, #DVI, #ACALEXT, +CALM, +CECALL

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

#SELINT, +WS46 , +COPS, +CPLS, +CCWE, +CTZU, +CGCLASS, +CGDCONT, +CGQMIN, +CGEQMIN, +CGQREQ, +CGEQREQ, +CEMODE, +CGSMS, +CGEQOS, #AUTOATT, #MSCLASS, #WKIO, #ALARMPIN, #DIALMODE, #CCLKMODE, +CALA, #GSMAD, #ENS, #SCFGEXT, #SCFGEXT2, #SCFGEXT3, #BASE64, #SSLEN, #DNS, #ICMP, #TCPMAXDAT, #HTTPCFG, $GPSGLO, $SLP, $SLPTYPE, $SUPLSEC, $SUPLV, $SLPTYPE, $LICLS, $SUPLV, $SUPLSEC, #SMSMODE, #SMSMODE, #NWEN, #PLMNMODE, #NWSCANTMR, #SMSATRUN, #SMSATRUNCFG, #TCPATRUNCFG, #ECALLTYPE , #BND, #SCFG, # TCPREASS, &Y, #VAUX, #TEMPMON, #BND, #TTY, #PASSW, #EPASSW, #SMTPCFG, #TCPATRUNFRWL,

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

+CSCA,	**+CSMP**,	**+CSCB,**
+CPNER		

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

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

Stored by #SKTSAV command and automatically restored at startup.
Factory default values will restored by the command #SKTRST.

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

3.4 AT Commands References

3.4.1 Command Line General Format

3.4.1 Command Line Prefixes

3.4.1.1.1 *Starting a Command Line - AT*

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

3.4.1.1.2 *Last Command Automatic Repetition - A/*

A/ - Last Command Automatic Repetition	
A/	If the prefix **A/** or **a/** is issued, the MODULE immediately executes once again the body of the preceding command line. No editing is possible and no termination character is necessary. A command line may 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

3.4.2 General Configuration Commands

3.4.2.1.1 *Select Interface Style - #SELINT*

#SELINT - Select interface style	
AT#SELINT=<v>	Set command sets the AT command interface style depending on parameter <v>. **Parameter:** **<v>** - AT command interface 2 - switches the AT command interface style of the product, to LE9x0 family
AT#SELINT?	Read command reports the current interface style.
AT#SELINT=?	Test command reports the available range of values for parameter **<v>**.
Note	It recommended performing a reboot the module after every **#SELINT** setting.

3.4.2.1.2 *Set notification port - #NOPT*

#NOPT - Set notification port	
AT#NOPT=<num>	Set command sets the port output notification data (Indication data) LE9x0 Family has the following 5 ports: • Telit USB Modem Port 1 • Telit USB Diagnostic Interface Port • Telit USB Modem Port 2 • UART Data Port Notification data will be sent to the specific port is set by #NOPT. Each port has the capability like as below table

	GND (C102)	TD (C103)	RD (C104)	RTS (C105)	CTS (C106)	DSR (C107)	DTR (C108)	RI (C125)	DCD (C125)
USB Modem	●	●	●	●	●	●	●	●	●
USB Diagnostic	●	●	●						
USB Auxiliary	●	●	●						
UART DATA	●	●	●	●	●	●	●	●	●
UART TRACE	●	●	●						

USB Diagnostic and UART TRACE are reserved for Telit Service.
USB Modem, USB Auxiliary and UART DATA are dedicated for M2M Interface.

#NOPT - Set notification port	
	Parameter: **<num>** - Notification Port 0 – All Ports (Telit USB Modem ports 1 and 2,UART Data) Notification data sent to all ports. < default value > 1 – UART Data Port only 2 – Telit USB Modem Port 1only 3 – Telit USB Modem Port 2 only
AT#NOPT?	Read command reports the current notification port.
AT#NOPT=?	Test command reports the available range of values for parameter **<num>**.

3.4.2.1.3 *USB composition configuration - #USBCFG*

#usbcfg – USB composition configuration	
AT#USBCFG=<composition>	Set command sets the USB composition according to <composition> number given, where: 0 - use 0x1201 composition file 1 - use 0x1203 composition file 2 - use 0x1204 composition file 3 - use 0x1205 composition file 4 - use 0x1206 composition file 0x1201: DIAG + ADB + RMnet + NMEA + MODEM + MODEM + SAP 0x1203: DIAG + ADB + Rndis + NMEA + MODEM + MODEM + SAP 0x1204: DIAG + ADB + MBIM + NMEA + MODEM + MODEM + SAP 0x1205: MBIM 0x1206: DIAG + ADB + ECM + NMEA + MODEM + MODEM + SAP After setting a new composition the device will reboot. If trying to set the same composition as currently set the command will return error.

	If composition settings failed the command will return error. If the new composition was set successfully the command will return OK. Default value for USB composition is 1201, AT#USBCFG? Will return 0 by default.
AT#USBCFG?	Read command returns the current composition set by number as detailed in the section above: 0x1201 composition file returns 0 0x1203 composition file returns 1 0x1204 composition file returns 2 0x1205 composition file returns 3 0x1206 composition file returns 4
AT#USBCFG=?	Test command returns OK.

3.4.2.1.4 *RMnet configuration - #RMNETCFG*

#RMNETCFG – rmnet configuration	
AT#RMNETCFG= **<instance>,** **<link_prot>,** **<qos>,** **<ul_tlp>,** **<autoconnect>,** **<ip_type>,** **<3gpp_profile>,**	This command can be used change the rmnet configuration. **Parameters:** **<instance>:** 1..16 - factory default value is 1 **<link_prot>:** ETH – IP - **<qos>:**

< 3gpp2_profile>	0 – enabled 1 – disabled **<ul_tlp>:** 0 – enabled 1 – disabled **<autoconnect>:** 0 – enabled 1 – disabled **<ip_type>:** "IP" - Internet Protocol "PPP" - Point to Point Protocol "IPV6" - Internet Protocol, Version 6 "IPV4V6" - Virtual <PDP_type> introduced to handle dual. **<3gpp_profile>:** 1..16 - factory default value is 3 **< 3gpp2_profile>:** 0001..0016 - factory default value is 0008 **Note: the** Set command **#RMNETCFG=** without parameters will create/ set the file with/ to a default values.
AT#RMNETCFG=?	Test command returns the supported range of values
Example	**AT#RMNETCFG =** 1,IP,,1,0,,4,6 OK

3.4.2.1.5 *Remote Network Driver Interface Specification setup- #RNDIS*

#RNDIS – Remote Network Driver Interface Specification setup	
AT#RNDIS=<Cid>,<Did>[,<UserId>,[<Pwd>,[<DhcpServerEnable>]]]	This command sets up an Remote Network Driver Interface Specification (RNDIS) session. Parameters: **<Cid>** - Context id **<Did>** - Device id, currently limited to 0 (only one device) **<UserId>** - string type, used only if the context requires it **<Pwd>** - string type, used only if the context requires it **<DhcpServerEnable>** - dhcp server abilitation: 0 – disabled 1 – enabled (default)

	Note: this command activates a context, so all necessary setup has to be done before it (registration, APN).
AT#RNDIS?	Read command returns the session state in the following format: **#RNDIS: <Did>,<State>** **...** **OK** where **<Did>** is currently 0 and **<State>** can be: 0 - disabled 1 - enabled
AT#RNDIS =?	Test command returns the range of supported values for all the parameters.

3.4.2.1.6 *Remote Network Driver Interface Specification configure- #RNDISC*

#RNDISC – Remote Network Driver Interface Specification configure	
AT#RNDISC=<Did>,<Parid>, <Address>	This command configures Remote Network Driver Interface Specification (RNDIS) session. Parameters: **<Did>** - Device id, currently limited to 0 (only one device) **<Parid>** - Parameter id: 0 – custom address 1 – custom mask 2 – custom gateway 3 – custom dns 1 4 – custom dns 2 **<Address>** - Parameter id: a valid IP address in the format xxx.xxx.xxx.xxx Note: if a parameter is different from 0.0.0.0 then it is used instead the default one. Note**:** changes will apply on the next RNDIS session and not the current one.
AT#RNDISC?	Read command returns the last session configuration in the following format: **#RNDISC: <Did>,<State>,<Address>,<Address_Mask>,<Address_Gateway>,<Address_Dns1>,<Address_Dns2>,<Address_Custom>,<Address_CustomMask>,<Address_CustomGateway>,<Address_CustomDns1>,<Address_CustomDns2>** **...**

	OK where **<Did>** is currently 0 **<State>** can be: 0 - disabled 1 – enabled **<Address>** is the default IP address **<Address_Mask>** is the default mask obtained from IP address **<Address_Gateway>** is the default IP address of gateway, obtained from IP address **<Address_Dns1>** is the IP address of the first DNS server, assigned by the network **<Address_Dns2>** is the IP address of the second DNS server, assigned by the network **<Address_Custom>** is the custom IP address **<Address_CustomMask>** is the custom mask **<Address_CustomGateway>** is the custom IP address of gateway **<Address_CustomDns1>** is the custom IP address of the first DNS server **<Address_CustomDns2>** is the custom IP address of the second DNS server Note**:** for each custom parameter, if not assigned by the user will return 0.0.0.0 Note**:** read command does not return the current address.
AT#RNDISC=?	Test command returns the range of supported values for all the parameters.

3.4.2.1.7 *Remote Network Driver Interface Specification shutdown- #RNDISD*

#RNDISD – Remote Network Driver Interface Specification shutdown	
AT#RNDISD=<Did>	This command is used to shutdown an Remote Network Driver Interface Specification (RNDIS) session. Parameters: **<Did>** - Device id, currently limited to 0 (only one device) Note: this command also deactivates the context.
AT#RNDISD?	Read command returns the session state in the following format: **#RNDISD: <Did>,<State>** **...** **OK** where **<Did>** is currently 0 and **<State>** can be:

	0 - disabled 1 - enabled
AT#RNDISD =?	Test command returns the range of supported values for all the parameters.

3.4.2.1.8 *command Delay - #ATDELAY*

#ATDELAY – AT Command Delay	**SELINT 2**
AT#ATDELAY=<delay>	Set command sets a delay in second for the execution of following AT command. **Parameters:** **<delay>** - delay in 100 milliseconds intervals; 0 means no delay Note: <delay> is only applied to first command executed after #ATDELAY
AT#ATDELAY?	Read command reports the currently selected parameter in the format: **#ATDELAY: <delay>**
AT#ATDELAY=?	Test command returns the supported range of values for parameter **<delay>**
Example	Delay “at#gpio=1,1,1” execution of 5 seconds: at#gpio=1,0,1;#atdelay=50;#gpio=1,1,1 OK

3.4.3 Hayes Compliant AT Commands

3.4.3.1 Generic Modem Control

3.4.3.1.1 *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>**:

&F - Set To Factory-Defined Configuration	
	0 – just factory profile's base section parameters are considered. 1 - Either the factory profile base section and the extended section are considered (full factory profile). **Note:** if parameter **<value>** is omitted, the command has the same behaviour as **AT&F0**
Reference	V25ter.

3.4.3.1.2 *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 terminated. **Note:** if parameter **<n>** omitted, the command has the same behaviour as **ATZ0**.
Reference	V25ter.

3.4.3.1.3 *Select Active Service Class - +FCLASS*

+FCLASS - Select Active Service Class	
AT+FCLASS=<n>	Set command sets the wireless module in specified connection mode (data, fax, voice). Hence, all the calls done afterwards will be data or voice. **Parameter:** **<n>** 0 - data 1 - fax class(not supported by LTE) 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

3.4.3.1.4 *Default Reset Basic Profile Designation - &Y*

&Y - Default Reset Basic Profile Designation	
AT&Y[<n>]	Execution command defines the basic profiles loaded on startup. **Parameter:** **<n>** 0..1 - profile (default is 0): the wireless module is able to store 2 complete configurations (see **&W**). **Note:** Differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&Y** will be loaded on every startup. **Note:** If parameter is omitted, the command has the same behaviour as **AT&Y0** **Note:** In LE9x0, AT&Y not supported.

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

3.4.3.1.6 *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

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

3.4.3.1.7 *Store Telephone Number on 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 over written, 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 dialed by giving the command **ATDS=<*n*>**.

3.4.3.1.8 *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>** i omitted then all the internal records shown.

3.4.3.1.9 *Manufacturer Identification - +GMI*

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

3.4.3.1.10 *Model Identification - +GMM*

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

3.4.3.1.11 *Request FLEX Revision Identification - #CGMF*

#CGMF – Request FLEX Revision Identification	
AT#CGMF	Execution command returns the device FLEX identification code without command echo.
AT#CGMF=?	Test command returns **OK** result code.

3.4.3.1.12 *Revision Identification - +GMR*

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

3.4.3.1.13 *Capabilities List - +GCAP*

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

3.4.3.1.14 *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
AT+GSN[=<snt>]	Set command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE connected to. **Parameter:** **<snt>** - indicating the serial number type that has been requested.

+GSN - Serial Number	
	0 - returns <sn> 1 - returns the IMEI (International Mobile station Equipment Identity) 2 - returns the IMEISV (International Mobile station Equipment Identity and Software Version number) 3 - returns the SVN (Software Version Number) where: **<sn>** - Indicate the product "serial number", identified as the IMEI of the mobile, without command echo. **<imei>** - string type in decimal format indicating the IMEI. . IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit). Character set used in <imei> is as specified by command Select TE Character Set +CSCS. **<imeisv>** - string type in decimal format indicating the IMEISV. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits). Character set used in <imeisv> is as specified by command Select TE Character Set +CSCS. **<svn>** - string type in decimal format indicating the current SVN which is a part of IMEISV. Character set used in <svn> is as specified by command Select TE Character Set +CSCS.
Reference	V.25ter

3.4.3.1.15 *Display Current Base Configuration and Profile - &V*

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

3.4.3.1.16 *Display Current Configuration and Profile - &V0*

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

3.4.3.1.17 *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**

&V1 - S Registers Display	
	<reg0> <dec> <hex> **<reg1> <dec> <hex>** ... **Where:** **<reg*n*>** - **S** register number 000..005 007 012 025 038 **<dec>** - current value in decimal notation **<hex>** - current value in hexadecimal notation

3.4.3.1.18 *Display Last Connection Statistics - &V2*

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

3.4.3.1.19 *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

3.4.3.1.20 *Single Line Connect Message - \V*

\V - Single Line Connect Message	
AT\V<n>	Execution command set single line connect message.

\V - Single Line Connect Message	
	Parameter: **<n>** 0 - off 1 - on

3.4.3.1.21 *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.
AT+GCI=?	Test command reports the supported country codes.
Reference	V25ter.

3.4.3.1.22 *Line Signal Level - %L*

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

3.4.3.1.23 *Line Quality - %Q*

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

3.4.3.1.24 *Speaker Loudness - L*

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

3.4.3.1.25 *Speaker Mode - M*

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

3.4.3.2 DTE - Modem Interface Control

3.4.3.2.1 *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 echo back to the **DTE** before the response is given. **Note:** if parameter is omitted, the command has the same behaviour of **ATE0**
ATE?	Read command returns the current value of n.
Reference	V25ter

3.4.3.2.2 *Quiet Result Codes - Q*

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

Q - Quiet Result Codes	
Reference	V25ter

3.4.3.2.3 *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 [§3.2.4 Information Responses And Result Codes] for the table of result codes). **Parameter:** **<n>** 0 - limited headers and trailers and numeric format of result codes i formation responses: **<text><CR><LF>** result codes: **< umer c 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

3.4.3.2.4 *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 report is disabled. 1...4 - reports all messages (factory default is 1). **Note:** If parameter is omitted, the command has the same behaviour of **ATX0** **Note:** Current value is returned by AT&V **Parameter:** **<n>** 0 - EXTENDED MESSAGES : X0=NO 1..4 - EXTENDED MESSAGES : X1=YES
Note	For complete control on **CONNECT** response message see also **+DR** command.
Reference	V25ter

3.4.3.2.5 *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

3.4.3.2.6 *Data Carrier Detect (DCD) Control - &C*

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

&C - Data Carrier Detect (DCD) Control	
	Parameter: **<n>** 0 - **DCD** remains **high** always. 1 - **DCD** follows the Carrier detect status: if carrier detected **DCD** is high, otherwise **DCD** is **low**. (factory default) 2 – **DCD** is always **high** except for 1sec 'wink' when a data call is disconnected. **Note:** if parameter is omitted, the command has the same behaviour of **AT&C0**
Reference	V25ter

3.4.3.2.7 *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** transmitions ignored (factory default) 1 - When the MODULE is connected, the **High** to **Low** transition of **DTR** pin sets the device in command mode and 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 - **C108/1** operation enabled. 4 - **C108/1** operation disabled. **Note:** if a connection has been set up issuing either **#SKTD** or **#SKTOP**, then **AT&D1** has the same effect as **AT&D2**. **Note:** if **AT&D2** been issued and the **DTR** has been tied **Low**, autoanswering is inhibited and it is possible to answer only issuing command **ATA**. **Note:** if parameter is omitted, the command has the same behaviour of **AT&D0**
Reference	V25ter

3.4.3.2.8 *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	
	1 - software bi-directional with filtering (**XON/XOFF**) 2 - hardware mono-directional flow control (only **CTS** active) 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

3.4.3.2.9 *Flow Control - &K*

&K - Flow Control	SELINT 2
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.
Note: &K has no Read Command. To verify the current setting of &K, simply check the settings of the active profile issuing AT&V. **Note:** Hardware flow control (AT&K3) is not active in command mode.	

3.4.3.2.10 *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

&S - Data Set Ready (DSR) Control	
	3 - **High** when device is ready to receive commands (factory default). **Note:** if option 1 selected, then **DSR** tied **High** when the device receives from the network the UMTS traffic channel indication. **Note:** in power saving mode the **DSR** pin always tied **Low** & USB_VBUS pin always tied Low. **Note:** if parameter is omitted, the command has the same behaviour of **AT&S0** **Note:** If option 1 or 2 active, **DSR** will not tied **High** in case of GSM voice connection.

3.4.3.2.11 *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. The command could be use to fix the **DTE-DCE** interface speed. **Note**: DTE speed of USB does not change. **Parameter:** **<rate>** 300 600 1200 2400 4800 9600 19200 38400 57600 115200 (default) 230400 460800 921600 2900000 3200000 3686400 4000000

+IPR - Fixed DTE Interface Rate	
	If **<rate>** specified **DTE-DCE** speed fixed to that speed, hence no speed auto-detection (autobauding) 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**:(list of supported autodetectable **<rate>** values), (list of fixed-only **<rate>** values)
Reference	V25ter

3.4.3.2.12 *DTE-Modem Local Flow Control - +IFC*

+IFC - DTE-Modem Local Flow Control	**SELINT 2**
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) Note: only possible commands are AT+IFC=0,0 and AT+IFC=2,2.
AT+IFC?	Read command returns active flow control settings.
AT+IFC=?	Test command returns all supported values of the parameters <by_te> and <by_ta>.
Reference	**V25ter**

3.4.3.2.13 *DTE-Modem Character Framing - +ICF*

+ICF - DTE-Modem Character Framing	
AT+ICF= **<format>** **[,<parity>]**	Set command defines the asynchronous character framing used when autobauding is disabled. The LE9x0 family supports only the 8 Data, 1 Stop setting. **Parameters:** **<format>** - determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame. 3 - 8 Data, 1 Stop (default)

+ICF - DTE-Modem Character Framing	
	<parity> - determines how the parity bit is generated and checked, if present; setting this subparameter has no meaning. 0 - Odd (not supported) 1 - Even (not supported)
AT+ICF?	Read command returns current settings for subparameters **<format>** and **<parity>**. The current setting of subparameter **<parity>** will always represented as 0.
AT+ICF=?	Test command returns the ranges of values for the parameters **<format>** and **<parity>**
Reference	V25ter
Example	AT+ICF = 3 - 8N1 (default) AT+ICF=? +ICF: (3)

3.4.3.2.14 *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 **&V** command. **Note:** if parameter is omitted, the command has the same behaviour of **AT\R0**

3.4.3.2.15 *DTE-Modem Local Rate Reporting - +ILRR*

+ILRR - DTE-Modem Local Rate Reporting	
AT+ILRR=<n>	Set command controls whether or not the **+ILRR: <rate>** information text transmitted from the **modem** (module) to the **DTE**. **Parameter:** **<n>** 0 - local port speed rate reporting disabled (factory default) 1 - local port speed rate reporting enabled **Note:** this information if enabled sent upon connection.
AT+ILRR?	Read command returns active setting of **<n>**.

+ILRR - DTE-Modem Local Rate Reporting	
AT+ILRR=?	Test command returns all supported values of the parameter **<n>**
Reference	V25ter

3.4.3.2.16 *Select Flow Control Specified By Type - +FLO*

+FLO - Select Flow Control Specified By Type	
AT+FLO=<type>	Set command selects the flow control behaviour of the serial port in both directions: from DTE to DTA and from DTA to DTE. **Parameter:** **<type>** - flow control option for the data on the serial port 0 - flow control None 2 - flow control Hardware (CTS-RTS) – (factory default) **Note: This command is a shortcut of the +IFC command.** **Note:** +FLO's settings are functionally a subset of **&K's** ones.
AT+FLO?	Read command returns the current value of parameter <type>
AT+FLO=?	Test command returns all supported values of the parameter <type>. **Note:** test command result is without command echo
Reference	ITU T.31 and TIA/EIA-578-A specifications

3.4.3.3 Call Control

3.4.3.3.1 *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 current value of the connection mode set by **+FCLASS** command. **Parameter:** **<number>** - phone number to be dialed **Note:** type of call (**data**, **fax** or **voice**) depends on last **+FCLASS** setting. **Note:** the numbers accepted are 0-9 and *,#,"A","B","C","+". **Note:** for backwards compatibility with landline modems modifiers "R", ",", "W", "!", "@" are accepted but have no effect. **Note:** "P" will pause the dial string according to ATS8 duration
ATD><str>[;]	Issues a call to phone number which corresponding alphanumeric field is **<str>**; all available memories will search for the correct entry. If "**;**" is present a **voice** call is performed.

D – Dial	
	Parameter: **<str>** - alphanumeric field corresponding to phone number. It must be enclosed in quotation 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 location **<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 this 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.
ATD><n>[;]	Issue a call to a phone number on entry location **<n>** of the active phonebook memory 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 number **<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

D – Dial	
	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 (see **+CGDATA** command). 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":* ATD>"Name"; OK
Reference	V25ter.

3.4.3.3.2 *Tone Dial - T*

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

3.4.3.3.3 *Pulse Dial - P*

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

3.4.3.3.4 *Answer - A*

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

3.4.3.3.5 *Disconnect - H*

H - Disconnect	
ATH	Execution command uses to close the current conversation (voice, data or fax). **Note:** this command 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 (see **register S2**) is required before issuing this command, otherwise if **&D1** option is active, **DTR** pin has to be tied **Low** to return in command mode.
Reference	V25ter.

3.4.3.3.6 *Return To On Line Mode - O*

O - Return To On Line Mode	
ATO	Execution command used to return to on-line mode from command mode. If there is 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.
Reference	V25ter.

3.4.3.3.7 *Guard Tone - &G*

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

3.4.3.3.8 *Sync/Async Mode - &Q*

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

3.4.3.4 Modulation Control

3.4.3.4.1 *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.

3.4.3.5 Compression Control

3.4.3.5.1 *Data Compression - +DS*

+DS - Data Compression	
AT+DS=[<dir>[,<neg>[,<P1>[,<P2>]]]]	Set command sets the V42 compression parameter. **Parameter:** **<dir> :** desired direction of operations 0 - no compression (factory default) 1 - Transmit only. 2 - Receive only. 3 - Both directions, accept any direction (Default). **<neg> :** whether the DCE should continue to operate if the desired result is not obtained. 0 Do not disconnect if V.42 bis is not negotiated by the remote DCE as specified in <direction>. **<P1> :** maximum number of dictionary entries 512-2048(Factory default is 2048)

+DS - Data Compression	
	<P2) : the maximum string length 6 – the only supported value
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

3.4.3.5.2 *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 1 - data compression reporting enabled upon connection **Note:** if enabled, the following intermediate result code is transmitted before the final result code: **+DR: <compression>**
AT+DR?	Read command returns current value of **<n>**.
AT+DR=?	Test command returns all supported values of the parameter **<n>**
Reference	V25ter

3.4.3.6 Break Control

3.4.3.6.1 *Transmit Break To Remote - \B*

\B - Transmit Break To Remote	
AT\B	Execution command has no effect and is included only for backward compatibility with landline modems

3.4.3.6.2 *Break Handling - \K*

\K - Break Handling	
AT\K[<n>]	Execution command has no effect and is included only for backward compatibility with landline modems **Parameter:** **<n>** 0..5

3.4.3.6.3 *Operating Mode - \N*

\N - Operating Mode	
AT\N	Execution command has no effect and is included only for backward compatibility with landline modems

3.4.3.7 S Parameters

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

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

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

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

Example:
ATS7<CR> establishes **S7** as last selected parameter.

Reference: V25ter and RC56D/RC336D

3.4.3.7.1 *Number of Rings to Auto Answer - S0*

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

3.4.3.7.2 *Ring Counter - S1*

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

3.4.3.7.3 *Escape Character - S2*

S2 - Escape Character	
ATS2=[<char>]	Set command sets the ASCII character used as escape characters. **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

3.4.3.7.4 *Command Line Termination Character - S3*

S3 - Command Line Termination Character	
ATS3=[<char>]	Set command sets the value of the character recognized by the device as command line terminator and 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) 0..127 - factory default value is 13 (ASCII **<CR>**) **Note:** the "previous" value of **S3** 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

3.4.3.7.5 *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** 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

3.4.3.7.6 *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:**

S5 - Command Line Editing Character	
	<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

3.4.3.7.7 *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 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

3.4.3.7.8 *Comma dial modifier time – S8*

S8 - Comma dial modifier time	
ATS8=[<time>]	Set command sets the amount of time, in seconds, that the DCE shall pause, during signalling of call addressing information to the network (dialling), when a "P" dial modifier is encountered in a dial string. **Parameter:** **<time>** - number of seconds 0 - DCE does not pause when "," encountered in dial string. 1 to 255 - Number of seconds to pause. Default value: 3
ATS8?	Read command returns the current value of **S8 parameter**.
Reference	V25ter

3.4.3.7.9 *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

3.4.3.7.10 *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 3 escapes 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(0.4 – 5 [s]) - 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. **Note:** if the Escape Sequence Guard Time set to a value different from zero, it overrides the one set with **S12**.
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

3.4.3.7.11 *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:** **<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

3.4.3.7.12 *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 period at least **<tout>** minutes.

S30 -Disconnect Inactivity Timer	
	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

3.4.3.7.13 *Delay before Forced Hang Up - S38*

S38 -Delay Before Forced Hang Up	
ATS38=[<delay>]	Set command sets the delay, in seconds, between the device's receipt of **H** command (or **ON**-to-**OFF** transition of **DTR**) and the disconnect operation. **Parameter:** **<delay>** - acknowledge timer in units of seconds 0..254 - the device will wait **<delay>** seconds for the remote device to acknowledge all data in the device buffer before disconnecting (factory default value is 20). 255 - the device doesn't time-out and continues to attempt to deliver data in the buffer until the connection is lost or the data is delivered. **Note: <delay>** parameter can be used to ensure that data in device buffer is sent before device disconnects.
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

3.4.4 3GPP TS 27.007 AT Commands

3.4.4.1 General

3.4.4.1.1 *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

3.4.4.1.2 *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

3.4.4.1.3 *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

3.4.4.1.4 *Request Product Serial Number Identification - +CGSN*

+CGSN - Request Product Serial Number Identification	
AT+CGSN[=<snt>]	Set command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE connected. **Parameter:** **<snt> -** indicating the serial number type that has been requested. 0 - returns <sn> 1 - returns the IMEI (International Mobile station Equipment Identity) 2 - returns the IMEISV (International Mobile station Equipment Identity and Software Version number) 3 returns the SVN (Software Version Number) **where:** **<sn> -** Indicate the product “serial number”, identified as the IMEI of the mobile, without command echo. **<imei> -** string type in decimal format indicating the IMEI. . IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit). Character set used in <imei> is as specified by command Select TE Character Set +CSCS. **<imeisv> -** string type in decimal format indicating the IMEISV. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits). Character set used in <imeisv> is as specified by command Select TE Character Set +CSCS. **<svn>** - string type in decimal format indicating the current SVN which is a part of IMEISV. Character set used in <svn> is as specified by command Select TE Character Set +CSCS.
AT+CGSN	Execution command returns the product “serial number”, identified as the IMEI of the mobile, without command echo.
AT+CGSN=?	Test command returns supported **<snt>** values.
Reference	3GPP TS 27.007

3.4.4.1.5 *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" - GSM default alphabet (3GPP TS 03.38/23.008). **"IRA"** - **international Reference** alphabet (ITU-T T.50) Quoted string (For example, "AB" equals two 8-bit characters with decimal values 65, 66). **"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). HEX representation (For example,00410042 equals two 16-bit characters with decimal values 65,66).
AT+CSCS?	Read command returns the current value of the active character set.
AT+CSCS=?	Test command returns the supported values for parameter **<chset>**.
Example	AT+CSCS=? +CSCS: ("GSM","IRA","8859-1","PCCP437","UCS2") OK AT+CSCS? +CSCS: "IRA" OK AT+CPBW=1,"8475763000",129,"Lin Zhao" OK AT+CSCS="UCS2" OK AT+CPBR=1 +CPBR: 1,"8475763000",129,004C006E006E0020005A00680061006F OK AT+CSCS="IRA" OK AT+CPBR=1 +CPBR: 1,"8475763000",129,"Lin Zhao"

+CSCS - Select TE Character Set	
	OK
Reference	3GPP TS 27.007

3.4.4.1.6 *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

3.4.4.1.7 *Read ICCID (Integrated Circuit Card Identification) - +ICCID*

+ICCID - Read ICCID	
AT+ICCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)
AT+ICCID=?	Test command returns the **OK** result code.
Example	AT+ICCID +ICCID: 898205070210016768 4F OK

3.4.4.1.8 *Serial and Software Version Number - +IMEISV*

+IMEISV - Serial and Software Version Number	
AT+IMEISV	Execution command returns returns the IMEISV (International Mobile station Equipment Identity and Software Version number).
Example	At+imeisv +IMEISV: 3540660590080701

3.4.4.1.9 *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) (factory default) 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.
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

3.4.4.1.10 *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: **AT+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

3.4.4.2 Call Control

3.4.4.2.1 *Call mode - +CMOD*

+CMOD - parameter command syntax	
+CMOD= **[<mode>]**	Set command selects the call mode of further dialling commands (D) or for next answering command (A). Mode can be either single or alternating (in the present document, terms "alternating mode" and "alternating call" refer to all GSM/UMTS bearer and teleservices that incorporate more than one basic service (voice, data, fax) within one call).

+CMOD - parameter command syntax	
	When single mode is selected the call originating and hangup procedures are similar to procedures specified in ITU-T Recommendations V.250 [14], T.31 [11] and T.32 [12]. **Note:** +CMOD shall be set to zero after a successfully completed alternating mode call. It shall be set to zero also after a failed answering. The power-up, factory (&F) and user resets (Z) shall also set the value to zero. This reduces the possibility that alternating mode calls are originated or answered accidentally. **Defined values** **<mode>:** 0 - single mode (default mode)
+CMOD?	Test command returns values supported as a compound value. **+CMOD:** <mode>
+CMOD=?	**+CMOD:** (list of supported <mode>s)

3.4.4.2.2 *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	GSM 07.07

3.4.4.2.3 *Select type of address - +CSTA*

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

3.4.4.2.4 *Select Bearer Service Type - +CBST*

+CBST - Select Bearer Service Type	
AT+CBST= **[<speed>** **[,<name>** **[,<ce>]]]**	Set command sets the bearer service **<name>** with data rate **<speed>**, and the connection element **<ce>** used when data calls are originated. This setting is also used during mobile terminated data call setup, in case of single numbering scheme calls (refer +CSNS). **Parameters:** **<speed>** - data rate 0 - autobauding (autobaud) 14 - 14400 bps (V.34) 16 - 28800 bps (V.34) 17 - 33600 bps (V.34) 43 - 14400 bps (V.120) 48 - 28800 bps (V.120) 51 - 56000 bps (V.120) 75 - 14400 bps (V110 or X.31 flag stuffing) 80 - 14400 bps (V110 or X.31 flag stuffing) 81 - 38400 bps (V110 or X.31 flag stuffing) 83 - 56000 bps (V110 or X.31 flag stuffing) 84 - 64000 bps (X.31 flag stuffing) 116 - 64000 bps (bit transparent) 134 – 64000 bps (multimedia) **<name>** - bearer service name 0 - data circuit asynchronous(UDI or 3.1 kHz modem) 1 - data circuit synchronous(UDI or 3.1 kHz modem) 4 - data circuit asynchronous(RDI) **<ce>** - connection element 0 - transparent 1 - non transparent (default) **The bearer service on LE9x0 family only has support for the following combinations:** **<GSM network>** AT+CBST= 0,0,1 (Autobaud 9.6k, non transparent) AT+CBST=14,0,1 (V.34 14.4k, non transparent) AT+CBST=43,0,1 (V.120 14.4k, non transparent) AT+CBST=75,0,1 (V.110 14.4k, non transparent) **<WCDMA network>** AT+CBST= 0,0,1 (Autobaud 57.6k, non transparent) AT+CBST=14,0,1 (V.34 14.4k, non transparent) AT+CBST=16,0,1 (V.34 28.8k, non transparent) AT+CBST=17,0,1 (V.34 33.6k, non transparent) AT+CBST=43,0,1 (V.120 14.4k, non transparent) AT+CBST=48,0,1 (V.120 28.8k, non transparent)

+CBST - Select Bearer Service Type	
	AT+CBST=51,0,1 (V.120 56k, non transparent) AT+CBST=75,0,1 (V.110 14.4k, non transparent) AT+CBST=80,0,1 (V.110 28.8k, non transparent) AT+CBST=81,0,1 (V.110 38.4k, non transparent) AT+CBST=83,0,1 (X.31FS 56k, non transparent) AT+CBST=83,4,1 (X.31FS 56k RDI, non transparent) AT+CBST=84,0,1 (X.31FS 64k, non transparent) AT+CBST=116,1,0 (Bit transparent 64 kbps, transparent)
AT+CBST?	Read command returns current value of the parameters **<speed>**, **<name>** and **<ce>**
AT+CBST=?	Test command returns the supported range of values for the parameters.
Reference	3GPP TS 27.007
Note	AT+CBST= 7,0,1 (V.32 9.6k, non transparent) - Not supported AT+CBST=12,0,1 (V.34 9.6k, non transparent)) - Not supported AT+CBST=39,0,1 (V.120 9.6k, non transparent) - Not supported AT+CBST=71,0,1 (V.110 9.6k, non transparent) - Not supported AT+CBST= 7,0,0 (V32 9.6k, transparent) - Not supported AT+CBST=12,0,0 (V34 9.6k, transparent) - Not supported AT+CBST=14,0,0 (V34 14.4k, transparent) - Not supported

3.4.4.2.5 *Radio Link Protocol - +CRLP*

+CRLP - Radio Link Protocol	
AT+CRLP= [<iws>[,<mws>[,<T1>[,<N2> [,<ver>]]]]]	Set command sets Radio Link Protocol (RLP) parameters used when non-transparent data calls originated. **Parameters:** **<iws>** - IWF window Dimension 1..61 - factory default value is 61 (ver 0/1) 1..488 - factory default value is 240 (ver 2) **<mws>** - MS window Dimension 1..61 - default value is 61 (ver 0/1) 1..488 - factory default value is 240 (ver 2) **<T1>** - acknowledge timer (10 ms units).

+CRLP - Radio Link Protocol	
	39..255 - default value is 48 (ver 0 or 1) 42..255 – deafault value is 52 (ver 2) **<N2>** - retransmission attempts 1..255 - default value is 6 (ver 0/1/2) **<ver>** - protocol version 0..2
AT+CRLP?	Read command returns current settings for each supported RLP version **<ver>**. **+CRLP:** <iws>,<mws>,<T1>,<N2> **+CRLP:** <iws>,<mws>,<T1>,<N2>,<ver> OK
AT+CRLP=?	Test command returns the range of setting value for each supported RLP version **<ver>**.
Reference	3GPP TS 27.007
Note	Versions 0 and 1 share the same parameter set. Read and Test commands shall return only one line for this set (where **<ver>** is not present)

3.4.4.2.6 *Service Reporting Control - +CR*

+CR - Service Reporting Control	
AT+CR=[<mode>]	Set command controls whether or not intermediate result code **+CR** is returned from **TA** to **TE**. **Parameter:** **<mode>** 0 - disables **+CR** reporting (factory default) 1 - enables **+CR** reporting: the intermediate result code is transmitted at the point during connect negotiation at which the **TA** has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code **CONNECT** is transmitted. It's format is: **Note:** After power off/on in LE9x0 the value returen to "0". **+CR: <serv>** **where:** **<serv>** ASYNC - asynchronous transparent SYNC - synchronous transparent REL ASYNC - asynchronous non-transparent REL SYNC - synchronous non-transparent.

+CR - Service Reporting Control	
	Note: This command replaces V.25ter [14] command Modulation Reporting Control (+**MR**), which is not appropriate for use with a UMTS terminal.
AT+CR?	Read command returns whether or not intermediate result code **+CR** is enabled, in the format: **+CR: <mode>**
AT+CR=?	Test command returns the supported range of values of parameter **<mode>**.
Reference	3GPP TS 27.007

3.4.4.2.7 *Extended Error Report - +CEER*

+CEER - Extended Error Report	
AT+CEER	Execution command returns two lines of information text **<report>** offering the TA user an extended error report, in the format: **+CEER: <report>** **+CEER: <report>** This report regards some error condition that may occur: - the failure in the last unsuccessful call setup (originating or answering) - the last call release - the last unsuccessful GPRS attach or unsuccessful PDP context activation, - the last GPRS detach or PDP context deactivation. **Note 1**: the first line for the voice and the second line for data. **Note 2:** if none of these conditions have occurred since power up then **"Normal, unspecified"** condition is reported
AT+CEER=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007, GSM 04.08

3.4.4.2.8 *Extended Error Report Unsolicited Response-#CEERURC*

#CEERURC - Extended Error Report	
AT#CEERURC= <mode>	Set command enable/disable the +CEER URC presentation regards some error condition that may occur. (See +CEER AT command). **Parameter:** < **mode** > 0 - Disable the presentation of the +CEER URC (default value). 1 - Enable the presentation of the +CEER URC.
AT#CEERURC?	Read command returns current value of the <mode> parameter: #CEERURC: <mode>
AT#CEERURC=?	Test command reports the supported range of values for parameter <mode>

3.4.4.2.9 *Cellular Result Codes - +CRC*

+CRC - Cellular Result Codes	
AT+CRC= **[<mode>]**	Set command controls whether or not the extended format of incoming call indication is used. **Parameter:** **<mode>** 0 - disables extended format reporting (factory default) 1 - enables extended format reporting: When enabled, an incoming call is indicated to the **TE** with unsolicited result code **+CRING: <type>** Instead of the normal **RING**. **Where:** **<type>** - call type: ASYNC - asynchronous transparent data SYNC - synchronous transparent data REL ASYNC - asynchronous non-transparent data REL SYNC - synchronous non-transparent data FAX - facsimile (TS 62) VOICE - normal voice (TS 11)
AT+CRC?	Read command returns current value of the parameter **<mode>**.
AT+CRC=?	Test command returns supported values of the parameter **<mode>**.
Reference	3GPP TS 27.007

3.4.4.2.10 *HSCSD non-transparent call configuration +CHSN*

+CHSN parameter command syntax	
AT+CHSN **=[<wAiur>** **[,<wRx>** **[,<topR>** **[,<codings** **>]]]]**	Set command controls parameters for originating non-transparent HSCSD calls. Values may also be used during mobile terminated data call setup. In GERAN, changing <topRx> or <codings> value during a call does not affect the current call. In GERAN, changing of <wAiur> or <wRx> affects the current call only if <topRx> was non-zero when call was established. **Defined values** **<wAiur>:** integer type; wanted air interface user rate. Default value 0 indicates that TA shall calculate a proper value from currently selected fixed network user rate **(<speed>** subparameter from +CBST command), <codings>, and **<wRx>** (or <maxRx> from **+CHSD** command if **<wRx>=0**). Other values:

+CHSN parameter command syntax	
	1 - 9600 bps 2 - 14400 bps 4 - 28800 bps 7 - 57600 bps **<wRx>:** integer type; wanted amount of receive timeslots. Default value 0 indicates that TA shall calculate a proper value from currently selected <wAiur> and <codings>. This parameter is not applicable to UTRAN or EUTRAN UEs. **<topRx>:** integer type; top value for <wRx> that user is going to request during the next established nontransparent HSCSD call. Default value 0 indicates that user is not going to change <wAiur>/<wRx> during the next call. This parameter is not applicable to UTRAN or E-UTRAN UEs. **<codings>:** a sum of integers each representing a channel coding that is accepted for non-transparent HSCSD calls. Default value 0 indicates that all supported codings are accepted (refer +CHSD command for other values). This parameter is not applicable to UTRAN or E-UTRAN UEs.
AT+CHSN ?	**+CHSN:** <wAiur>,<wRx>,<topRx>,<codings>
AT+CHSN= ?	**+CHSN:** (list of supported <wAiur>s), (list of supported <wRx>s),(list of supported <topRx>,(list of supported <codings>s)

3.4.4.2.11 *Single Numbering Scheme - +CSNS*

+CSNS - Single Numbering Scheme	
AT+CSNS= [<mode>]	Set command selects the bearer used when the mobile terminated single numbering scheme call is established. Parameter values set with **+CBST** command used when **<mode>** equals to a data service. **Parameter:** **<mode>** 0 - voice (factory default) 2 - fax (TS 62)/9 (not supported by LTE) 4 - data **Note:** if **+CBST** parameter is set to a value that is not applicable to single numbering calls, ME/TA shall map the value to the closest valid one. E.g. if user has set **<speed>=71**, **<name>=0** and **<ce>=1** (non-trasparent asynchronous 9600 bps V.110 ISDN connection) for mobile originated calls, ME/TA shall map the values into non-trasparent asynchronous 9600 bps V.32 modem connection when single numbering scheme call is answered.
AT+CSNS?	Read command returns current value of the parameter**<mode>**.

+CSNS - Single Numbering Scheme	
AT+CSNS=?	Test command returns supported values of parameter **<mode>**.
Reference	3GPP TS 27.007

3.4.4.2.12 *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 disconnect or not. **Parameter:** **<mode>** 0 - "Drop DTR" ignored but OK result code given. ATH disconnects. 1 - "Drop DTR" and ATH ignored but OK result code given. 2 - "Drop DTR" behaviour according to &D setting. ATH disconnects (factory default).
AT+CVHU?	Read command reports the current value of the **<mode>** parameter, in the format: **+CVHU: <mode>**
AT+CVHU=?	Test command reports the range of supported values for parameter **<mode>**

3.4.4.2.13 *Setting Time Format - +CSTF*

+CSTF - Setting Time Format	
AT+CSTF= [<mode>]	Set command sets the time format of the time information presented to the user. Refer subclause 9.2 for possible <err> values **Possible Response(s):** *+CME ERROR: <err>* **Defined values** **<mode>:** integer type. The default value is manufacturer specific. 1 HH:MM (24 hour clock) 2 HH:MM a.m./p.m. 3-7 Manufacturer specific
AT+CSTF?	Read command reads the currnt setting. **Possible Response(s):** **+CSTF: <mode>** ***+CME ERROR: <err>***
AT+CSTF=?	Test command reads the supported <modes>s as a compound value.

+CSTF - Setting Time Format	
	+CSTF: (list of supported <mode>s) **+CME ERROR: <err>**
Reference	3GPP TS 27.007

3.4.4.2.14 *Setting Date Format - +CSDF*

+CSDF - Setting Date Format	
AT+CSDF=[[<mode>][,<auxmode>]]	This command sets the date format via MMI 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. The command also sets the date format of the TE-TA interface, which is specified by use of the <auxmode> parameter (e.g. the <auxmode> affects the <time> of +CCLK and +CALA). If the parameter is omitted ("+CSDF=","+CSDF=<mode>","+CSDF=,<auxmode>"), then this sets the default value. Refer subclause 9.2 for possible <err> values. **Possible Response(s):** *+CME ERROR: <err>* **Defined values:** **<mode>:** integer type **Note 1:** It is a manufactur specific which modes are supported. 1 - DD-MMM-YYYY **Note 2**: Presentation of MMM is language dependent. 2 - DD-MM-YY 3 - MM/DD/YY 4 - DD/MM/YY 5 - DD.MM.YY 6 - YYMMDD 7 - YY-MM-DD 8-255 Manufacturer specific **<auxmode>:** integer type 1 - yy/MM/dd 2 - yyyy/MM/dd all other values are reserved by the present document **Note 3:** The <time> format of +CCLK and +CALA "yy/mm/dd,hh:mm:ss±zz" when <auxmode>=1 and it is "yyyy/mm/dd,hh:mm:ss±zz" when <auxmode>=2. If the MT

+CSDF - Setting Date Format	
	does not support time zone information then the three last characters may be omitted (see +CCLK command).
AT+CSDF?	Read command reads the currnt setting. **Possible Response(s):** **+CSDF: <mode>[,<auxmode>]** ***+CME ERROR: <err>***
AT+CSDF=?	Test command reads the supported <modes>s as a compound value. **+CSDF: (list of supported <mode>s)** **[,(list of supported <auxmode>s)]**
Reference	3GPP TS 27.007

3.4.4.3 Network Service Handling

3.4.4.3.1 *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

3.4.4.3.2 *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 alphanumeric format (see **+COPS**) **Note:** each operator code **<numeric*n*>** that has an alphanumeric equivalent **<alpha*n*>** in the ME memory is returned
AT+COPN=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.4.4.3.3 *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) 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:**

+CREG - Network Registration Report	
	<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** **7 E-UTRAN** **Note: <Lac>,<Ci> and <Act>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CREG?	Read command reports the **<mode>** and **<stat>** parameter values in the format: **+CREG: <mode>,<stat>[,<Lac>,<Ci>,<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 OK at+creg? +CREG: 0,2 OK *(the MODULE is in network searching state)* at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,1 OK *(the MODULE is registered)* at+creg? +CREG: 0,1 OK
Reference	3GPP TS 27.007

3.4.4.3.4 *Operator Selection - +COPS*

+COPS - Operator Selection	
AT+COPS= **[<mode>** **[,<format>** **[,<oper>>** **[,< AcT>]]]]**	Set command forces an attempt to select and register the GSM\UMTS network operator. <Mode> parameter defines whether the operator selection is automatically or forced by this command to operator <oper>. The operator <oper> given in format <format>. **Parameters:** **<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 5 – UNKNOWN. Note: 'UNKNOWN' is a value of 'read command' and not of 'set command'. This is a transient state that occur while modem is initialized. **<format>** 0 - alphanumeric long form (max length 16 digits) 1 - short format alphanumeric <oper> 2 numeric <oper> **<Oper>:** string type <format> indicates if the format is alphanumeric or numeric. long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]). numeric format is the GSM Location Area Identification number (refer 3GPP TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific. Returned <oper> shall not be in BCD format, but in IRA characters converted from BCD. Hence, the number has the structure: (country code digit 3) (country code digit 2) (country code digit1) (network code digit 3) (network code digit 2) (network code digit 1). **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 **<AcT>:** access technology selected 0 - GSM 1 - GSM Compact 2 - UTRAN 3 - GSM w/EGPRS (see NOTE 1) 4 - UTRAN w/HSDPA (see NOTE 2) 5 - UTRAN w/HSUPA (see NOTE 2) 6 - UTRAN w/HSDPA and HSUPA (see NOTE 2) 7 - E-UTRAN **NOTE:** 3GPP TS 44.060 [71] specifies the System Information messages which give

+COPS - Operator Selection	
	the information about whether the serving cell supports EGPRS. **NOTE:** 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
AT+COPS?	Read command returns current value of **<mode>**,**<format>** and **<oper>** in format **<format>**; if no operator is selected, **<format>** and **<oper>** are omitted **+COPS: <mode>[,<format>,<oper>,< AcT>]**
AT+COPS=?	Test command returns a list of quintuplets, each representing an operator present in the network. The quintuplets in the list are separated by commas: **+COPS:** [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>,< AcT>)s] [,,(list of supported <mode>s),(list of supported <format>s)] **where:** **<stat>** - operator availability 0 - unknown 1 - available 2 - current 3 - forbidden **<AcT>:** access technology selected 0 - GSM 1 - GSM Compact 2 - UTRAN 3 - GSM w/EGPRS (see NOTE 1) 4 - UTRAN w/HSDPA (see NOTE 2) 5 - UTRAN w/HSUPA (see NOTE 2) 6 - UTRAN w/HSDPA and HSUPA (see NOTE 2) 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

3.4.4.3.5 *Facility Lock/Unlock - +CLCK*

+CLCK - Facility Lock/Unlock	
AT+CLCK=<fac>,<mode>	Execution command used to lock or unlock a **ME** or a network facility. **Parameters:**

+CLCK - Facility Lock/Unlock	
[,<passwd> [,<class>]]	**<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**) "AC" - All inComing barring services (applicable only for **<mode>=0**) "FD" - SIM fixed dialling 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 (refer 3GPP TS 22.022 [33]) "PC" - Corporate Personalization (refer 3GPP TS 22.022 [33]) "PF" - lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted) **<mode>** - 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)(not supported by LTE) 8 - short message service 16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access **Note**: Personalization lock facility will lock the network to the current SIM only.

+CLCK - Facility Lock/Unlock	
	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
AT+CLCK=?	Test command reports all the facilities supported by the device.
Reference	3GPP TS 27.007
Example	*Querying such a facility returns an output on three rows, the first for voice, the second for data, the third for fax:* AT+CLCK =”AO”,2 +CLCK: <status>,1 +CLCK: <status>,2 +CLCK: <status>,4

3.4.4.3.6 *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 “SC” - SIM (PIN request) “AB” - All barring services “P2” - SIM PIN2 “AC” - All inComing barring services “AG” - All outGoing barring services “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) **<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

+CPWD - Change Facility Password	
	Note: parameter **<oldpwd>** is the old password while **<newpwd>** is the new one.
AT+CPWD=?	Test command returns a list of pairs **(<fac>,<pwdlength>)** which presents the available facilities and the maximum length of their password (**<pwdlength>**)
Example	at+cpwd=? +CPWD:("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),("IR",4),("OI",4),("OX",4),("SC",8),("P2",8) OK
Reference	3GPP TS 27.007

3.4.4.3.7 *Calling Line Identification Presentation - +CLIP*

+CLIP - Calling Line Identification Presentation	
AT+CLIP=[<n>]	Set command enables/disables the presentation of the CLI (Calling Line Identity) at the **TE**. This command refers to the UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the CLI of the calling party when receiving a mobile terminated call. **Parameters:** **<n>** 0 - disables CLI indication (factory default) 1 - enables CLI indication If enabled the device reports after each RING the response: **+CLIP: <number>,<type>,"",128,<alpha>,<CLI_validity>** **where:** **<number>** - string type phone number of format specified by **<type>** **<type>** - type of address octet in integer format 128 - both the type of number and the numbering plan are unknown 129 - Unknown type of number and ISDN/Telephony numbering plan 145 - International type of number and ISDN/Telephony numbering plan (contains the character "+") 161 - National type of number and ISDN/Telephony numbering plan **<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

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

3.4.4.3.8 *Calling Line Identification Restriction - +CLIR*

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

+CLIR - Calling Line Identification Restriction	
	<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 behaviour of the device in outgoing calls.

3.4.4.3.9 *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.
AT+COLR=?	Test command tests for command existence

3.4.4.3.10 *Connected line identification presentation - COLP*

+COLP - Connected line identification presentation	
AT+COLP=[<n>]	Set command enables or disables the presentation of the COL at the TE **Parameter:** **<n>** 0 – disable (factory default) 1 - enable

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

3.4.4.3.11 *Called line identification presentation - +CDIP*

+CDIP - parameter command syntax	
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 used when normal voice call answered. **<n>** (parameter sets/shows the result code presentation status to the TE): 0 - disable 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 [8] 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 [8] subclause 10.5.4.8)
AT+CDIP?	**+CDIP: <n>,<m>**

+CDIP - parameter command syntax	
	Read command gives the status of <n> also triggers an interrogation of the provision status of the "multiple called numbers" service. Test command returns values supported as a compound value. Defined values <n> (parameter sets/shows the result code presentation status to the TE): 0 - disable 1 – enable **<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=?	+CDIP: (list of supported <n>s)

3.4.4.3.12 *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 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 "+")

+CCFC - Call Forwarding Number And Condition	
	<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) (not supported by LTE) 8 - short message service 16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access **<time>** - time in *seconds* to wait before call is forwarded; it is valid only when <reason> "no reply" is enabled (<cmd>=1) or queried (<cmd>=2) 1..30 - automatically rounded to a multiple of 5 seconds (default is 20) **Note:** when <cmd>=2 and command successful, it returns: **+CCFC:** <status>,<class1>[,<number>,<type>[,,,<time>]][<CR><LF> +CCFC: <status>,<class2>[,<number>,<type>[,,,<time>]][…]] **where:** <status> - current status of the network service 0 - not active 1 - active **<class*n*>** - same as <class> **<time>** - it is returned only when <reason>=2 (“no reply”) and <cmd>=2. The other parameters are as seen before. **Example:** AT+CCFC=0,2 → to check if the unconditional call forwarding is on or off. AT+CCFC=0,3,"Nunber" → To register the unconditional call forwarding to the network. AT+CCFC=0,1,"Nunber" → To activate the unconditional call forwarding. AT+CCFC=0,0 → To deactivate the unconditional call forwarding . Example for Registration & activation : AT+CCFC=0,3,"+972575684414" → for registration

+CCFC - Call Forwarding Number And Condition	
	AT+CCFC=0,1,"+ 972575684414" → for activation **Note:** Please see GSM 03.82 for more info.
AT+CCFC=?	Test command reports supported values for the parameter <reason>.
Reference	3GPP TS 27.007
Note	When querying the status of a network service (<cmd>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>.

3.4.4.3.13 *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: <enable>,<status>,<fwdtonum>** **where:** **<status>** 0 – CFU disabled 1 – CFU enabled **<fwdtonum>** The number that the 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>.

3.4.4.3.14 *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 supported. **Parameters:** **<n>** - enables/disables the presentation of an unsolicited result code: 0 - disable 1 - enable **<cmd>** - enables/disables or queries the service at network level: 0 - disable 1 - enable 2 - query status **<class>** - is a sum of integers each representing a class of information which the command refers to; default is 7 (**voice** + **data** + **fax**) 1 - voice (telephony) 2 - data 4 - fax (facsimile services)(not supported by LTE) 8 - short message service 16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access **Note:** the response format to the query command is: **+CCWA: <status>,<class1>[<CR><LF>** **+CCWA: <status>,<class2>[…]]** **Where:** **<status>** represents the status of the service: 0 - inactive 1 - active **<class*n*>** - same as **<class>** **Note:** the unsolicited result code enabled by parameter **<n>** is in the format: **+CCWA: <number>,<type>,<class>,[<alpha>][,<cli_validity>]** **where:** **<number>** - string type phone number of calling address in format specified by **<type>** **<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

+CCWA - Call Waiting	
	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>** omitted then network not interrogated. **Note:** ON the query command, the class parameter must not be issue. **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 sent to the third party. **Note:** The command **AT+CCWA=1,0** has no effect a non sense and must not be issued..
AT+CCWA?	Read command reports the current value of the parameter **<n>**.
AT+CCWA=?	Test command reports the supported values for the parameter **<n>**.
Reference	3GPP TS 27.007

3.4.4.3.15 *Call Holding Services - +CHLD*

+CHLD - Call Holding Services	
AT+CHLD=[<n>]	Execution command controls the network call hold by the service. With this service, it is possible to disconnect temporarily a call and keep it suspended while the network, contemporary it is possible to connect another party or make a multiparty connection, retains it. **Parameter:** **<n>** 0 - releases all held calls, or sets the UDUB (User Determined User Busy) indication for a waiting call. 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 3 - adds an held call to the conversation 4 - Connects the two calls and disconnects the subscriber from both calls (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 released. New calls take the lowest available number.

+CHLD - Call Holding Services	
	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. Note: for VOLTE conference call **<n>**=2X and **<n>**=4 parameter not supported Note: for VOLTE while no active or held calls option **<n>**=3 starts conference call to conference server without participants
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

3.4.4.3.16 *Call deflection - +CTFR*

+CTFR - Call deflection	
AT+CTFR=<number>[,<type>[,<subaddr>[,<satype>]]]	This refers to a service that causes an incoming alerting call to be forward to a specified number. Action command does this. This is based on the GSM/UMTS supplementary service CD (Call Deflection; refer 3GPP TS 22.072 [30]). The interaction of this command with other commands based on other GSM/UMTS supplementary services is described on GSM/UMTS standard. Refer subclause **(3.2.3 ME Error Result Code - +CME ERROR: <err>)** for possible <err> values. Possible response(s): +CME ERROR: <err> **NOTE:** Call Deflection is only applicable to teleservice 11. Defined values: **<number>:** string type phone number of format specified by <type> **<type>:** type of address octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.7); 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] subclause 10.5.4.8); default 128
AT+CTFR=?	Test command returns the **OK** result code

3.4.4.3.17 *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 02.90/22.090]). **Parameters:** **<n>** - used to disable/enable the presentation of an unsolicited result code. 0 - disable the result code presentation in the **DTA** 1 - enable the result code presentation in the **DTA** 2 - cancel an ongoing USSD session (not applicable to read command response) **<str>** - 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
Note	Only mobile initiated operations are supported

3.4.4.3.18 *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.

+CAOC - Advice Of Charge	
	Parameter: **<mode>** 0 - query CCM value 1 - disables unsolicited CCM reporting 2 - enables unsolicited CCM reporting **Note:** the unsolicited result code enabled by parameter **<mode>** is in the format: **+CCCM: <ccm>** **where:** **<ccm>** - current call meter in home units, string type: three bytes of the CCM value in hexadecimal format (e.g. "00001E" indicates decimal value 30) **Note:** the unsolicited result code **+CCCM** 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

3.4.4.3.19 *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 1 - held

+CLCC - List Current Calls	
	2 - dialing (**MO** call) 3 - alerting (**MO** call) 4 - incoming (**MT** call) 5 - waiting (**MT** call) **<mode>** - call type 0 - voice 1 - data 2 - fax (not supported by LTE) 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. Note: in VOLTE conference call participant's numbers start with "sip:" or "tel:", for example: sip:+12125551212
AT+CLCC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.4.4.3.20 *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 1 - enable **<m>** - sets the **+CSSU** result code presentation status 0 - disable 1 - enable When **<n>**=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code:

+CSSN - SS Notification	
	+CSSI: <code1> is sent to **TE** before any other **MO** call setup result codes, **where:** **<code1>**: 0 - unconditional call forwarding is active 1 - some of the conditional call 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)
AT+CSSN?	Read command reports the current value of the parameters.
AT+CSSN=?	Test command reports the supported range of values for parameters **<n>**, **<m>**.
Reference	3GPP TS 27.007

3.4.4.3.21 *Non-Access-Stratum compliancy - #NASC*

#NASC - Non-Access-Stratum compliancy	
AT#NASC= <mode>	Set command allows to selects NAS compliancy. **Parameter:** < mode > - NAS specification-compliant 0 - Forces UE to be Release 99 NAS specification - compliancy. 1 - Forces UE to be Release 5 NAS specification - compliancy**.** 2 - Forces UE to be Release 6 NAS specification - compliancy (NVM default value). 3 - Forces NAS to comply with 3GPP Release 7. **Important note:** Need to power cycle the unit for the setting to take effect. **Note:** the mode is saved into the NVM
AT#NASC	Execution command returns the setting to the default value.
AT#NASC?	Read command returns the current value of parameter **<mode>.**
AT#NASC=?	Test command returns all supported values of the parameter <mode>. **Example:**

	at#nasc=? #NASC: (0-3) OK

3.4.4.3.22 *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 **Note:** In LE9x0 the default value is (0,10,0).
AT+CCUG?	Read command reports the current value of the parameters
AT+CCUG=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

3.4.4.3.23 *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>** 2 - numeric **<oper>** **<oper>** - string type **<GSM_AcT>** - GSM access technology 0 – access technology not selected

+CPOL - Preferred Operator List	
	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.
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

3.4.4.3.24 *Selection of preferred PLMN list - +CPLS*

+CPLS - Selection of preferred PLMN list +CPLS	
AT+CPLS=<list>	Set command select one PLMN selector with Access Technology list in the SIM card or active application in the UICC (GSM or USIM), that is used by +CPOL command. **Parameter:** **<list>**: 0 - User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC) (Default) 1 - Operator controlled PLMN selector with Access Technology EFOPLMNwAcT 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 listsby the SIM./USIM
Reference	3GPP TS 27.007

3.4.4.4 Mobile Equipment Control

3.4.4.4.1 *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:** In model LE920, LE910 "1,2" are 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

3.4.4.4.2 *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 by UART. 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 mechanism (factory default) 2 - disable TX (Not support) 4 - disable both TX and RX 5 – same as 1 6 – mobile reboot Special modes , you can only see them only through the read command and you can't set those mode : 7 – Offline mode 8 – FTM **<rst>** - reset flag 0 - do not reset the ME before setting it to <fun> Functionality level. 1- reset the ME before setting it to <fun> functionality level, This option works only with <fun> =1, with other it will return an error. **Note**: **AT+CFUN=2** is not supported. **Note:** Issuing AT+CFUN=4[,0] actually causes the module to perform either a network deregistration and a SIM deactivation. **Note:** power saving mechanism, 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, plug out the USB and set the DTR (RS232) line 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 enabled the DTR line and wait for the CTS (RS232) line to go in ON status. while 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

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

3.4.4.4.3 *Enter PIN - +CPIN*

+CPIN - Enter PIN	
AT+CPIN= <pin> [,<newpin>]	Set command sends the device a necessary password 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?** **Note:** If all parameters omitted then the behaviour of Set command is the same as Read command.
AT+CPIN?	Read command reports the PIN/PUK/PUK2 request status of the device in the form: **+CPIN: <code>** **where:** **<code>** - PIN/PUK/PUK2 request status code **READY -** ME is not pending for any password **SIM PIN -** ME is waiting SIM PIN to be given **SIM PUK -** ME is waiting SIM PUK to be given PH-SIM PIN - ME is waiting phone-to-SIM card password to be given PH-FSIM PIN - ME is waiting phone-to-very first SIM card password to be given PH-FSIM PUK - ME is waiting phone-to-very first SIM card unblocking password to be given SIM PIN2 - ME is waiting SIM PIN2 to be given; this **<code>** is returned only when the last executed command resulted in PIN2 authentication failure (i.e. **+CME ERROR: 17**) **SIM PUK2** - ME is waiting SIM PUK2 to be intered. 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

<table>
<tr><td>+CPIN - Enter PIN</td><td></td></tr>
<tr><td></td><td>PH-NET PUK - ME is waiting network personalization unblocking password to be given
PH-NETSUB PIN - ME is waiting network subset personalization password to be given
PH-NETSUB PUK - ME is waiting network subset personalization unblocking password to be given
PH-SP PIN - ME is waiting service provider personalization password to be given
PH-SP PUK - ME is waiting service provider personalization unblocking password to be given
PH-CORP PIN - ME is waiting corporate personalization password to be given
PH-CORP PUK - ME is waiting corporate personalization unblocking password to be given

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

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

<table>
<tr><td>A</td><td>&K</td><td>+FCLASS</td><td>+CPIN</td></tr>
<tr><td>D</td><td>&N</td><td>+GCAP</td><td>+CSQ</td></tr>
<tr><td>H</td><td>&P</td><td>+GCI</td><td>+CIND</td></tr>
<tr><td>O</td><td>&S</td><td>+IPR</td><td>+CMER</td></tr>
<tr><td>E</td><td>&V</td><td>+IFC</td><td>+CCLK</td></tr>
<tr><td>I</td><td>&W</td><td>+ILRR</td><td>+CALA</td></tr>
<tr><td>L</td><td>&Y</td><td>+ICF</td><td></td></tr>
<tr><td>M</td><td>&Z</td><td>+CRSM</td><td></td></tr>
<tr><td>P</td><td>+DS</td><td></td><td></td></tr>
<tr><td>Q</td><td>%L</td><td>+DR</td><td></td></tr>
<tr><td>%Q</td><td>+CGMI</td><td></td><td></td></tr>
<tr><td>T</td><td>\Q</td><td>+CGMM</td><td></td></tr>
<tr><td>V</td><td>+CGMR</td><td>+CLAC</td><td></td></tr>
<tr><td>X</td><td>\V</td><td>+GMI</td><td>+CMEE</td></tr>
<tr><td>Z</td><td>#CGMI</td><td>+GMM</td><td>+CGREG</td></tr>
<tr><td>&C</td><td>#CGMM</td><td>+GMR</td><td>+CBC</td></tr>
</table>
</td></tr>
</table>

+CPIN - Enter PIN	
	&D, #CGMR, +CGSN, +CSDH &F, #CGSN, +GSN, +CNMI +COPS, +CHUP, +CRC +CLIP, #SHDN, +CRLP +CPAS, +CR, +CREG +CFUN All the above commands, but **+CSDH** and **+CNMI**, can be issued even if ME is waiting for phone-To-SIM card password to be given
Reference	3GPP TS 27.007

3.4.4.4.4 *Signal Quality - +CSQ*

+CSQ - Signal Quality	
AT+CSQ	Execution command reports received signal quality indicators in the form: **+CSQ: <rssi>,<sq>** **Where:** **<rssi>** - received signal strength indication (3GPP) 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 **<rssi>** - received signal strength indication (TDSCDMA) 100: (-116) dBm or less 101: (-115) dBm 102…191 (-114…-26) dBm 191: (-25) dBm or greater 199: Not known or not detectable **<sq>** - signal quality – as mentioned below: 2G (GSM) – RXQUAL [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

+CSQ - Signal Quality	
	3G (UTRAN) – ECIO [in dBm]: 0: (-1) to (0) 1: (-5) to (-2) 2: (-8) to (-6) 3: (-11) to (-9) 4: (-15) to (-12) 5: (-18) to (-16) 6: (-22) to (-19) 7: (-24) to (-23) 99 - not known or not detectable 4G (LTE) – RSRQ [in dBm]: 0: (-4) to (-3) 1: (-6) to (-5) 2: (-8) to (-7) 3: (-10) to (-9) 4: (-13) to (-11) 5: (-15) to (-14) 6: (-17) to (-16) 7: (-19) to (-18) 99 - not known or not detectable **Note:** this command should be used instead of the **%Q** and **%L** commands, since GSM/WCDMA relevant parameters are the radio link ones and no line is present, hence **%Q** and **%L** have no meaning.
AT+CSQ=?	Test command returns the supported range of values of the parameters **<rssi>** and **<ber>**. **Note:** although **+CSQ** is an execution command without parameters, 3GPP TS 27.007 requires the Test command to be defined.
Reference	3GPP TS 27.007

3.4.4.4.5 *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

+CIND - Indicator Control	
	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. 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. (default)
AT+CIND?	Read command returns the current value of ME indicators, in the format: **+CIND**: <**ind**>,<**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))**,… **(**<**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 (from 3300mV to 4200mV) **0..5 –** bar levels. **99** - not measurable. "**signal**" - signal quality (see +CSQ). <**ind**> - signal quality indicator range **0..7 –** bar levels. **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. "**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.

+CIND - Indicator Control	
	"**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 ≤ (-113) dBm . **1..4** - signal strength in 15 dBm steps. **5** - signal strength ≥ (-51) dBm . **99** - not measurable. "**GPRS coverage**" – there is packet service coverage. **0** – no packet service. **1** – module attached to a packet service. "**callsetup**" – call setup status indicator. **0** - No active call setup. **1** - MT call is waiting of ringing. **2** - MO call was initiated. **3** - MO call ringing at B-party.
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**

+CIND - Indicator Control	
Reference	3GPP TS 27.007

3.4.4.4.6 *Indicator Control for current values - #CIND*

#CIND – Indication Control ReaderIndication	
AT#CIND?	Read command returns the current values of +CIND, in the format: #CIND: <cind_ind>,<cind_ind>, … <cind_ind> **Where:** <cind_ind> - cind current set value according to the index of +CIND command. 0 - Unset 1 – Set
AT#CIND=?	Test command returns the supported range of values for the +CIND set <cind_ind>.
Example	*Next command changed the +CIND values:* AT+CIND=1,0,1,0,0,1,0,1,1,0,0 *Next command to query the current value of all indicators:* AT#CIND? #CIND: 1,0,1,0,0,1,0,1,1,0,0
Note	see command **+CIND**

3.4.4.4.7 *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

+CMER - Mobile Equipment Event Reporting	
	0 - discard **+CIEV** Unsolicited Result Codes. 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. 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 replaced with a **Break** (100 ms), and is stored in a buffer; onche 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 2 - indicator event reporting **<bfr>** - TA buffer clearing 0 - TA buffer of unsolicited result codes is cleared when <mode> 1..3 is entered 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

3.4.4.4.8 *Select Phonebook Memory Storage - +CPBS*

+CPBS - Select Phonebook Memory Storage	
AT+CPBS= <storage>	Set command selects phonebook memory storage **<storage>**, which will be use 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). "DC" - MT dialled calls list "ME" – MT phonebook "EN" - SIM/USIM (or MT) emergency number (+CPBW is not be applicable for this storage) "ON" - SIM (or MT) own numbers (MSI torage may be available through +CNUM also). "MB" - mailbox numbers stored on SIM; it is possible to select this storage only if the mailbox service provided by the SIM (see **#MBN**). "SD" - SIM Service Dialling Numbers (SDN) phonebook **(+CPBW** is not applicable for this storage).
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 is more than one missed call 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>**.
Example	AT+CPBS="SM" → current phonebook storage is SIM AT+CPBR=1 +CPBR: 1,"0105872928",129,"James" OK
Reference	3GPP TS 27.007

3.4.4.4.9 *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>** omitted, only location **<index1>** 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>[…]]]** or **+CME ERROR: <err>** **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.** **<hidden>** - indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden **<group> -** group name the entry may belong to; used character set should be the one selected with command **+CSCS.** **<adnumber> -** additional string type phone number of format **<adtype>**. **<adtype> -** additional type number octet in integer format. 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<secondtext>** - the alphanumeric text associate secondary text; used character set should be the one selected with command **+CSCS.** **<email> -** The alphanumeric text associate email address; used character set should be the one selected with command **+CSCS.**
AT+CPBR=?	Test command returns the supported range of values for parameters **<index*n*>** and the maximum lengths of **<number>** and **<text>** fields, in the format:

+CPBR - Read Phonebook Entries	
	+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>** – group name length for example AND group, FDN group. **<slength>** – Secondary text length associate with the number. **<elength>** – **<email>** length **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: (1-500),40,20,2,20,20 OK AT+CPBR=1 +CPBR: 1,”01048771234”,129,”James”,””,””,0,””,”” OK
Reference	3GPP TS 27.007

3.4.4.4.10 *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:**

+CPBF - Find Phonebook Entries	
	<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.** **<hidden>** - indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden **<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. **Note: +CPBF** is not applicable if the current selected storage (see **+CPBS**) is either "MC", either "RC" or "LD" or "DC". **Note:** if **<findtext>=""** the command returns all the phonebook records. **Note:** If no PB, records satisfy the search criteria then an **ERROR** message reported.
AT+CPBF=?	Test command reports the maximum lengths of **<number>** and **<text>** fields, in the format: **+CPBF: [<nlength>],[<tlength>],[< glength >],[< slength >],[< elength >]** **where:**

+CPBF - Find Phonebook Entries	
	<nlength> - maximum length of field **<number>**, integer type **<tlength>** - maximum length of field **<text>**, integer type **<glength>** – group name length for example AND group, FDN group **<slength>** – Secondary text length associate with the number **<elength>** – email length *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" *Selecting phonebook* OK AT+CPBF="J" *Searching for string "J"* +CPBF: 1,"01048771234",129,"James","","",0,"","" +CPBF: 2,"0169998888",129,"Jane","","",0,"","" OK *Searching for everything in phone book, and finding all entries* AT+CPBF="" +CPBF: 1,"01048771234",129,"James","","",0,"","" +CPBF: 2,"0169998888",129,"Jane","","",0,"","" +CPBF: 7,"0115556666",129,"Juliet","","",0,"","" +CPBF: 5,"0181111234",129,"Kevin","","",0,"","" OK
Reference	3GPP TS 27.007

3.4.4.4.11 *Write Phonebook Entry - +CPBW*

+CPBW - Write Phonebook Entry	
AT+CPBW= **[<index>]** **[,<number>** **[,<type>** **[,<text>** **[,<group>** **[,<adnumber>** **[,<adtype>**	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

+CPBW - Write Phonebook Entry	
[,<secondtext>[,<email] [,<hidden>]]]]]]]]	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**. **<hidden>** - indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden **<group> -** group name the entry may belong to; used character set should be the one selected with command **+CSCS.** **<adnumber> -** additional string type phone number of format **<adtype>**. **<adtype> -** additional type number octet in integer format. 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<secondtext>** - the alphanumeric text associate secondary text; used character set should be the one selected with command **+CSCS.** **<email> -** The alphanumeric text associate email address; used character set should be the one selected with command **+CSCS.** **Note:** If record number **<index>** already exists, it will be overwritten. **Note:** if either **<number>**, **<type>**, **<text>, <group>, <adnumber>, <adtype>, <secondtext> and <email>** omitted. The phonebook entry in location **<index>** deleted. **Note:** if **<index>** is omitted or **<index>**=0, the number **<number>** is stored in the first free phonebook location. **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>**. **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>**

+CPBW - Write Phonebook Entry	
	where: **<nlength>** - integer type value indicating the maximum length of field **<number>**. **<tlength>** - integer type value indicating the maximum length of field **<text>** **<glength>** – group name length for example AND group, FDN group. **<slength>** – Secondary text length associate with the **<adnumber>** number. **<elength>** – email length. 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
Reference	3GPP TS 27.007
Example	AT+CPBW=? +CPBW: (1-500),40,(129,145),255,2,255,255 OK AT+CPBW=6,"18651896699",129,"John" OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.

3.4.4.4.12 *Clock Management - +CCLK*

+CCLK - Clock Management	
AT+CCLK=<time>	Set command sets the real-time clock of the **ME**. **Parameter:** **<time>** - current time as quoted string in the format: **"yy/MM/dd,hh:mm:ss±zz"** **yy** - year (two last digits are mandatory). range is (00..99) **MM** - month (two last digits are mandatory). range is (01..12) **dd** - day (two last digits are mandatory). available ranges are: (01..28) (01..29)

+CCLK - Clock Management	
	(01..30) (01..31) **hh** - hour (two last digits are mandatory). range is (00..23) **mm** - minute (two last digits are mandatory). range is (00..59) **ss** - Seconds (two last digits are mandatory). range is (00..59) **±zz** - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory), range is -96..+96
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="02/09/07,22:30:00+00" OK AT+CCLK? +CCLK: 02/09/07,22:30:25 OK
Reference	3GPP TS 27.007

3.4.4.4.13 *Restricted SIM Access - +CRSM*

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

+CRSM - Restricted SIM Access	
	<P1>,**<P2>**,**<P3>** - parameter passed on by the **ME** to the SIM; they are mandatory for every command except GET RESPONSE and STATUS 0..255 **<Data>** - information to be read/written to the SIM (hexadecimal character format). The response of the command is in the format: **+CRSM: <sw1>,<sw2>[,<response>]** **where:** **<sw1>**,**<sw2>** - information from the SIM about the execution of the actual command either on successful or failed execution. **<response>** - on a successful completion of the command previously issued it returns 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=214,28539,0,0,8,C69018C7958C87 +CRSM: 144,0 OK

+CRSM - Restricted SIM Access	
	Update Record, ADN(6F3A) AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF +CRSM: 144,0 OK Status, FPLMN(6F7B) AT+CRSM=242,28539 +CRSM: 144,0,623C820238218410A0000000871002FFFFFFFF8904 0300FFA5118001318103010A3282011E8304000030E08A01058B032F0609C609 9001C0830101830181
Reference	3GPP TS 27.007, 3GPP TS 11.11/51.011

3.4.4.4.14 *Accumulated Call Meter - +CACM*

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

3.4.4.4.15 *Ringer Sound Level - +CRSL*

+CRSL - Ringer Sound Level	
AT+CRSL= <level>	Set command used to select the incoming of the sound level of the call ringer on the device.

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

3.4.4.4.16 *Loudspeaker Volume Level - +CLVL*

+CLVL - Loudspeaker Volume Level	
AT+CLVL=<level>	Set command 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=?** (+2dB/step, factory default=8)
AT+CLVL?	Read command reports the current **<level>** setting of the loudspeaker volume in the format: **+CLVL: <level>**
AT+CLVL=?	Test command reports **<level>** supported values range in the format: **+CLVL: (0-*max*)**
Reference	3GPP TS 27.007

3.4.4.4.17 *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.

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

3.4.4.4.18 *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. **Parameters:** **<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>.

3.4.4.4.19 *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 consum by the subscriber. When ACM reaches **<acmmax>** value, further calls 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.
AT+CAMM?	Read command reports the ACMmax value stored in SIM in the format: **+CAMM : <acmm>**

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

3.4.4.4.20 *Price per Unit and Currency Table - +CPUC*

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

3.4.4.4.21 *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 reached. The warning is issued approximately when 30 seconds call remain. It is also issued when starting a call if less than 30 seconds call time remains. **Parameters:** <**mode**>: 0 - Disable the call meter warning event (default) 1 - Enable the call meter warning event **Note:** the set command will respond with an error if the Accumulated Call Meter service is not active in SIM

+CCWE – Call Meter maximum event	
AT+CCWE?	Read command reports the currently selected <mode> in the format: **+CCWE: <mode>**
AT+CCWE=?	Test command reports the supported range of values for parameter **<mode>**
Reference	3GPP TS 27.007

3.4.4.4.22 *Available AT Commands - +CLAC*

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

3.4.4.4.23 *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 "+") Note: Set command only checks for parameters values validity; it does not any actual write to SIM to update voice mail number.
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

3.4.4.4.24 *Time Zone Reporting - +CTZR*

+CTZR – Time Zone reporting	SELINT 2
AT+CTZR=<onoff>	This command enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed. **Parameters:** **<onoff>:** 0 - Disable time zone change event reporting (default) 1 - Enable time zone change event reporting
AT+CTZR?	Read command reports the currently selected **<onoff>** in the format: **+CTZR: <onoff>**
AT+CTZR=?	Test command reports the supported range of values for parameter **<onoff>**

3.4.4.4.25 *Automatic Time Zone update - +CTZU*

+CTZU – automatic Time Zone update	SELINT 2
AT+CTZU=<onoff>	This command enables 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>

3.4.4.5 Mobile Equipment Errors

3.4.4.5.1 *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>** result code instead of the default **ERROR** result code. **ERROR** anyway returned normally when the error message 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 **Note:** default value after powerup is "0"
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**

+CMEE - Report Mobile Equipment Error	
Reference	3GPP TS 27.007

3.4.4.6 Voice Control

3.4.4.6.1 *DTMF Tones Transmission - +VTS*

+VTS - DTMF Tones Transmission	
AT+VTS= <dtmfstring> [,duration]	Execution command allows the transmission of DTMF tones. **Parameters:** **<dtmfstring>** - string of **<dtmf>s,** i.e. ASCII characters in the set **(0-9), #,*,(A-D,P)**; the string can be at most 255 **<dtmf>s** long; 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. 10..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**: P – pause of 3 seconds. **Note:** This command operates in voice mode only (see **+FCLASS**).
AT+VTS=?	Test command provides the list of supported **<dtmf>s** and the list of supported **<duration>s** in the format: **(list of supported <dtmf>s)[,(list of supported <duration>s)]**
Reference	3GPP TS 27.007 and TIA IS-101

3.4.4.6.2 *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 1..255 - duration of every single tone in 1/10 sec. The default is 2.
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:

+VTD - Tone Duration	
	(list of supported <duration>s)
Reference	3GPP TS 27.007 and TIA IS-101

3.4.4.6.3 *Embedded DTMF decoder enabling - #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 • 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.

3.4.4.7 Commands for GPRS

3.4.4.7.1 *GPRS Mobile Station Class - +CGCLASS*

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

+CGCLASS - GPRS mobile station class	
	Note: the setting is saved in NVM (and available on following reboot).
AT+CGCLASS?	Read command returns the current value of the GPRS class in the format: **+CGLASS: <class>**
AT+CGCLASS=?	Test command reports the range for the parameter **<class>**

3.4.4.7.2 *GPRS Attach or Detach - +CGATT*

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

3.4.4.7.3 *GPRS Event Reporting - +CGEREP*

+CGEREP - GPRS Event Reporting	
AT+CGEREP= [<mode> [,<bfr>]]	Set command enables or disables sending of unsolicited result codes **+CGEV: XXX** (see below) from **TA** to **TE** in the case of certain events occurring in the **TA** or the network. **Parameters:** **<mode>** - controls the processing of **URCs** specified with

+CGEREP - GPRS Event Reporting	
	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.** **+CGEV: NW DETACH** The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME DETACH** The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME CLASS <class>** The mobile equipment has forced a change of MS class. The highest available class is reported (see +**CGCLASS**)

+CGEREP - GPRS Event Reporting	
AT+CGEREP?	Read command returns the current <mode> and <bfr> settings, in the format: **+CGEREP: <mode>,<bfr>**
AT+CGEREP=?	Test command reports the supported range of values for the **+CGEREP** command parameters.
Reference	3GPP TS 27.007

3.4.4.7.4 *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 GPRS network registration status, it is issued the unsolicited result code: **+CGREG: <stat>** 2 - enable network registration and location information unsolicited result code: **+CGREG: <stat>[,<lac_tac>,<ci>[,<AcT>,<rac_mme_code>]]** **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 If **<n>=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_tac>,<ci>,<Act>,<rac_mme_code>]** **where:** **<stat>** - registration status (see above for values) **<lac_tac>** - 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>:** integer type; access technology of the serving cell **0 - GSM** **2 - UTRAN** **3 - GSM w/EGPRS**

+CGREG - GPRS Network Registration Status	
	4 - UTRAN w/HSDPA **5 - UTRAN w/HSUPA** **6 - UTRAN w/HSDPA and HSUPA** **7 - E-UTRAN** **<rac_mme_code> -** string type; one byte routing area code (2G, 3G) or Mobile Management Entity code (4G) in hexadecimal format.
AT+CGREG?	Read command returns the status of result code presentation mode **<n>** and the integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format: **+CGREG: <n>,<stat>[,<lac_tac>,<ci>,<Act>,<rac_mme_code>]** **Note: <lac_tac>,<ci>,<Act> and <rac_mme_code>** are reported only if **<n>=2** and the mobile is registered on some network cell.
AT+CGREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

3.4.4.7.5 *Printing IP Address Format - +CGPIAF*

+CGPIAF - Printing IP Address Format	
AT+CGPIAF= **[<IPv6_AddressFormat>** **[,<IPv6_SubnetNotation>** **[,<IPv6_leadingZeros>** **[,<IPv6_compressZeros>]]]]**	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.

+CGPIAF - Printing IP Address Format	
	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

3.4.4.7.6 *Define PDP Context - +CGDCONT*

+CGDCONT - Define PDP Context	
AT+CGDCONT= **[<cid>** **[,<PDP_type>** **[,<APN>** **[,<PDP_addr>** **[,<d_comp>** **[,<h_comp>** **[,<IPv4AddrAlloc>** **[,<Emergency_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. **<APN>** - (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. **<PDP_addr>** - a string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the **+CGPADDR** command.

+CGDCONT - Define PDP Context	
	<d_comp> - numeric parameter that controls PDP data compression. 0 - off (default if value is omitted) 1 – on 2 - V.42bis **<h_comp>** - numeric parameter that controls PDP header compression. 0 - off (default if value is omitted) 1 – on 2 - RFC1144 (applicable for SNDCP only) 3- RFC2507 4- RFC3095 (applicable for PDCP only) **<IPv4AddrAlloc>**: integer type; controls how the MT/TA requests to get the IPv4 address information 0 - IPv4 Address Allocation through NAS Signalling 1 - IPv4 Address Allocated through DHCP **<Emergency_ind>**: integer type; indicates whether the PDP context is for emergency bearer services or not. 0 - PDP context is not for emergency bearer services 1 - PDP context is for emergency bearer services **Note:** a special form of the Set command, **+CGDCONT=<cid>**, causes the values for context number **<cid>** to become undefined, except **cid** = 1 and emergency profile. **Note:** emergency profile could be undefined only after setting emergency indication parameter to 0. **Note**: Although max number of PDP profile is 24 , the user can only create 16 PDP profiles (persistent profiles) , the rest 8 are temporarily profiles.
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_ind><CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,<IPv4AddrAlloc>,<emergency_ind>**
AT+CGDCONT=?	Test command returns values supported as a compound value
Example	AT+CGDCONT=1,”IPV4V6”,”apn”,”10.10.10.10” OK AT+CGDCONT? +CGDCONT: 1,”IPV4V6”,”apn”,”10.10.10.10”,0,0,0,0 +CGDCONT: 2,”IPV4V6”,”ims”,”0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0”,0,0,0,0 +CGDCONT: 3,”IPV4V6”,”sos”,”0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0”,0,0,0,1 OK AT+CGDCONT=? +CGDCONT: (1-24),”IP”,,,(0-2),(0-4),(0-1),(0-1)

+CGDCONT - Define PDP Context	
	+CGDCONT: (1-24),"PPP",,,(0-2),(0-4),(0-1),(0-1) +CGDCONT: (1-24),"IPV6",,,(0-2),(0-4),(0-1),(0-1) +CGDCONT: (1-24),"IPV4V6",,,(0-2),(0-4),(0-1),(0-1) OK
Reference	3GPP TS 27.007

3.4.4.7.7 *Sets IMS Pdp APN Name - #IMSPDPSET*

#IMSPDPSET – sets IMS Pdp APN Name	
AT#IMSPDPSET = <pdpApnName>	This command sets IMS Pdp APN Name. This name should be one of the APN names set in cgdcont command and appropriated context will be opened for IMS. **<pdpApnName>** - from 1 to 32 symbols ANSI fixed string. **Note:** Can be used with or without quotes.
AT#IMSPDPSET?	Read command reports existing IMS Pdp APN Name in format: #IMSPDPSET: ims

3.4.4.7.8 *SMS transport configuration - #ISMSCFG*

#ISMSCFG – SMS transport configuration	
AT#ISMSCFG=<mode>	Set command changes the configuration parameter for outgoing SMS, which will be used to route the 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>**

#ISMSCFG – SMS transport configuration	
AT#ISMSCFG=?	Test command returns the supported range of values for parameter <**mode**>, in the format: **#ISMSCFG:** (list of supported **<mode>**s)

3.4.4.7.9 *IMS registration state - +CIREG*

+CIREG – IMS registration state	
AT+CIREG= <mode>	Set command controls the presentation of an unsolicited result code when there is a change in the MT's IMS registration information. Parameter: **<mode>** integer type. Enables or disables reporting of changes in the MT's IMS registration information. 0 - disable reporting (default) 1 - enable reporting (parameter <reg_info>). 2 - enable extended reporting (parameters <reg_info> and <ext_info>). Note: parameter **<mode>** is saved in profile. Unsolicited result code has the following format: **+CIREGU: <reg_info>[,<ext_info>]** Where: **<reg_info>:** integer type. Indicates the IMS registration status. The UE is seen as registered as long as one or more of its public user identities are registered with any of its contact addresses, see 3GPP TS 24.229 [89]. 0 - not registered. 1 - registered. **<ext_info>:** numeric value in hexadecimal format. The value range is from 1 to FFFFFFFF. It is a sum of hexadecimal values, each representing a particular IMS capability of the MT. The MT can have IMS capabilites not covered by the below list. This parameter is not present if the IMS registration status is "not registered".

	1 - RTP-based transfer of voice according to MMTEL, see 3GPP TS 24.173 [87]. This functionality can not be indicated if the UE is not available for voice over PS, see 3GPP TS 24.229 [89]. 2 - RTP-based transfer of text according to MMTEL, see 3GPP TS 24.173 [87]. 4 - SMS using IMS functionality, see 3GPP TS 24.341 [101]. 8 - RTP-based transfer of video according to MMTEL, see 3GPP TS 24.173 [87].
AT+CIREG?	Read command reports the current state of IMS registration in the format: **+CIREG: <mode>,<reg_info>[,<ext_info>]** see above for parameter description
AT+CIREG=?	Test command returns the supported range of values for parameter <**mode**>.

3.4.4.7.10 *Codec for IMS- #CODECIMS*

#CODECIMS – Codec for IMS	
AT#CODECIMS=[<amr_wb>],[<amr_nb>],[<amr_wb_en>]	Set command sets the IMS codec mode. Parameters: <amr_wb> - AMR Wideband mode; configurable as a bitmask - 0x1 - Mode 0 (6.60kbps) - 0x2 - Mode 1 (8.85kbps) - 0x4 - Mode 2 (12.65kbps) (Default) - 0x8 - Mode 3 (14.25kbps) - 0x10 - Mode 4 (15.85kbps) - 0x20 - Mode 5 (18.25kbps) - 0x40 - Mode 6 (19.85kbps) - 0x80 - Mode 7 (23.05kbps) - 0x100 - Mode 8 (23.85kbps) <amr_nb> - AMR Narrowband mode; configurable as a bitmask - 0x1 - Mode 0 (4.75kbps) - 0x2 - Mode 1 (5.15kbps) - 0x4 - Mode 2 (5.9kbps) - 0x8 - Mode 3 (6.17kbps) - 0x10 - Mode 4 (7.4kbps) - 0x20 - Mode 5 (7.95kbps) - 0x40 - Mode 6 (10.2kbps) - 0x80 - Mode 7 (12.2kbps) (Default) - 0x100 - Mode 8 (12.2kbps) <amr_wb_en> - High definition voice; it enables AMR-Wideband

	- 0 - Disable - 1 - Enable (Default) Note: The values are stored in the NV's file system. <amr_wb> - NV 67239 <amr_nb> - NV 66031 <amr_wb_en> - NV 65964
AT#CODECIMS?	Read command returns the current IMS CODEC configuration mode in the format: #CODECIMS: <amr_wb>,<amr_nb>,<amr_wb_en>
AT#CODECIMS=?	Test command returns the available range values of parameters: <amr_wb>,<amr_nb>,<amr_wb_en>
Example	at#codecims=149,5,1 Means : <amr_wb> = 149 ; mode 0, 2, 4, 7 <amr_nb> = 5 ; mode 0, 2 <amr_wb_en> = 1 ; AMR-Wideband is enabled

3.4.4.7.11 *Define Secondary PDP Context - +CGDSCONT*

+CGDSCONT parameter command syntax	
AT+CGDSCONT= [<cid> ,<p_cid> [,<d_comp> [,<h_comp>]]]	Possible response(s): OK ERROR **Description:** The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context Identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. In EPS the command is used to define traffic flows. A special form of the set command, +CGDSCONT= <cid> causes the values for context number <cid> to become undefined. The read command returns the current settings for each defined context. **Defined values:** **<cid>:** a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TEMT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. **<p_cid>:** a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the

+CGDSCONT parameter command syntax	
	TE-MT interface. The list of permitted values is returned by the test form of the command. **<d_comp>:** a numeric parameter that controls PDP data compression (applicable for SNDCPonly) (refer 3GPP TS 44.065 [61]) 0 - off (default if value is omitted) 1 - on (manufacturer preferred compression) 2 - V.42bis 3 - V.44 Other values are reserved. **<h_comp>:** a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]) 0 - off (default if value is omitted) 1 - on (manufacturer preferred compression) 2 - RFC1144 (applicable for SNDCP only) 3 - RFC2507 4 - RFC3095 (applicable for PDCP only) Other values are reserved.
AT+CGDSCONT?	**AT+CGDSCONT:** <cid>, <p_cid>, <d_comp>,<h_comp>[<CR><LF>+CGDSCONT: <cid>, <p_cid>,<d_comp>, <h_comp> [...]]
AT+CGDSCONT=?	**AT+CGDSCONT:** (range of supported <cid>s), (list of <cid>s for active primary contexts), (list of supported <d_comp>s), (list of supported <h_comp>s)

3.4.4.7.12 *Traffic Flow Template +CGTFT*

+CGTFT parameter command syntax	
AT+CGTFT= [<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	**Possible Response(s):** OK ERROR This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE. The concept further described in the 3GPP TS 23.060 [47]. A TFT consists of from one and up to 16 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address. The set command specifies a Packet Filter that whom added to the TFT stored in the MT and used for the context identified by the (local) context identification

+CGTFT parameter command syntax	
of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)> [,<direction>]]]]]]]]]]	parameter, <cid>. The specified TFT will be stored in the GGSN in UMTS/GPRS and Packet GW in EPS only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGTFT command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value. A special form of the set command, +CGTFT= <cid> causes all of the Packet Filters in the TFT for context number <cid> to become undefined. At any time there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. **Defined values** **<cid>:** a numeric parameter which specifies a particular PDP context definition(see the +CGDCONT and +CGDSCONT commands). The following parameters are defined in 3GPP TS 23.060 [47]: **<packet filter identifier>:** a numeric parameter, value range 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".

+CGTFT parameter command syntax	
	<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 is 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 - Birectional (Up & Downlink) (default if omitted) Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060 [47].
AT+CGTFT?	The read command returns the current settings for all Packet Filters for each defined context. **AT+CGTFT:** <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> [<CR><LF>+CGTFT: <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>[…]]
AT+CGTFT=?	The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be use. **AT+CGTFT:** <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet

+CGTFT parameter command syntax	
	mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class(ipv6) and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s) [<CR><LF> **AT+CGTFT:** <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s)[…]]

3.4.4.7.13 *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 **<delay>** - delay class **<reliability>** - reliability class **<peak>** - peak throughput class **<mean>** - mean throughput class 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.
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 defined, it has no effect and **OK** result code 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),

+CGQMIN - Quality Of Service Profile (Minimum Acceptable)	
	(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) **Note:** only the "IP" PDP Type currently supported.
Example	AT+CGQMIN=1,0,0,3,0,0 OK AT+CGQMIN? +CGQMIN: 1,0,0,5,0,0 OK AT+CGQMIN=? +CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31) +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

3.4.4.7.14 *3G Quality of Service Profile (Minimum Acceptable) - +CGEQMIN*

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
AT+CGEQMIN= **[<cid>** **[,<Traffic class>** **[,<Maximum bitrate UL>** **[,<Maximum bitrate DL>** **[,<Guaranteed bitrate UL>** **[,<Guaranteed bitrate DL>** **[,<Delivery order>** **[,<Maximum SDU size>** **[,<SDU error ratio>** **[,<Residual bit error ratio>** **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority>** **[,<Source statistics descriptor>** **[,<Signalling indication>]]]]]]]]]]]]]]]]	Set command allows specify a 3G quality of service profile for the context identified by the (local) context identification parameter <cid> that is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept Message. **Parameters:** **<cid>** - PDP context identification (see **+CGDCONT** command). **<Traffic class>** - Traffic class 0 - conversational 1 - streaming 2 - interactive 3 - background 4 - subscribed value **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s) 0 - subscribed value 1…11520 **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s) 0 - subscribed value 1…42200 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s)

	0 - subscribed value 1…11520 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s) 0 - subscribed value 1…42200 **<Delivery order>** SDU Delivery oreder 0 - no 1 - yes 2 - subscribed value **<Maximum SDU size>** Maximum SDU size in octets 0 - subscribed value 1…1520 **<SDU error ratio>** SDU error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” **<Residual bit error ratio>** Residual bitt error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “5E2” “1E2” “5E3” “4E3” “1E3” “1E4” “1E5” “1E6” “6E8” **<Delivery of erroneous SDUs>** Delivery of erroneous SDUs 0 - no 1 – yes 2 – no detect 3 – subscribed value **<Transfer delay >** Transfer delay (milliseconds) 0 – subscribed value 100…4000 **<Traffic handling priority >** Traffic handling priority

	0 - subscribed value 1…3 **<Source Statistics Descriptor>:** a numeric parameter that specifies 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 (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). 3GPP Release 8 140 3GPP TS 27.007 V8.3.0 (2008-03) 0 - Characteristics of SDUs is unknown (default value) 1 - Characteristics of SDUs corresponds to a speech source Other values are reserved. **<Signalling Indication>:** a numeric parameter used to indicate signalling content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). 0 - PDP context is not optimized for signalling (default value) 1 - PDP context is optimized for signalling **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 defined, it has no effect and **OK** result code returned.
AT+CGEQMIN=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+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),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0- 1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **+CGEQMIN**: "PPP",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0- 1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **+CGEQMIN**: "IPV6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0- 1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **+CGEQMIN**: "IPV4V6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0- 1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **OK**
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

3.4.4.7.15 *Quality of Service Profile (Requested) - +CGQREQ*

+CGQREQ - Quality Of Service Profile (Requested)	
AT+CGQREQ= [<cid>[, <precedence> [,<delay>[,<reliability>[,<peak>	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).

+CGQREQ - Quality Of Service Profile (Requested)	
[,<mean>]]]]]]	**<precedence>** - precedence class **<delay>** - delay class **<reliability>** - reliability class **<peak>** - peak throughput class **<mean>** - mean throughput class 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) **Note:** only the "IP" PDP_Type currently supported.
Example	AT+CGQREQ? +CGQREQ: 1,0,0,3,0,0 OK AT+CGQREQ=1,0,0,3,0,0 OK AT+CGQREQ=? +CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

3.4.4.7.16 3G Quality of Service Profile (Requested) - +CGEQREQ

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
AT+CGEQREQ= **[<cid>** **[,<Traffic class>** **[,<Maximum bitrate UL>** **[,<Maximum bitrate DL>** **[,<Guaranteed bitrate UL>** **[,<Guaranteed bitrate DL>** **[,<Delivery order>** **[,<Maximum SDU size>** **[,<SDU error ratio>** **[,<Residual bit error ratio>** **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority>]]]]]]]]]]]]**	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network. **Parameters:** **<cid>** - PDP context identification(see **+CGDCONT** command). **<Traffic class>** - Traffic class 0 - conversational 1 - streaming 2 - interactive 3 - background 4 - subscribed value **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s) 0 - subscribed value 1…11520 **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s) 0 - subscribed value 1…42200 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s) 0 - subscribed value 1…11520 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s) 0 - subscribed value 1…42200 **<Delivery order>** SDU Delivery oreder 0 - no 1 - yes 2 - subscribed value **<Maximum SDU size>** Maximum SDU size in octets 0 - subscribed value 1…1520 **<SDU error ratio>** SDU error ratio - mEe mean m*10^{-e} , for example 1E2 mean 1*10^{-2} “0E0” “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” **<Residual bit error ratio>** Residual bitt error ratio - mEe mean m*10^{-e} , for example 1E2 mean 1*10^{-2}

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	"0E0" "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 **<Transfer delay >** Transfer delay (milliseconds) 0 – subscribed value 100…4000 **<Traffic handling priority >** Traffic handling priority 0 - subscribed value 1…3 **<Source Statistics Descriptor>** A numeric parameter that specifies 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 (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). 0 - Characteristics of SDUs is unknown (default value) 1 - Characteristics of SDUs corresponds to a speech source **<Signalling Indication>** A numeric parameter used to indicate signalling content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). 0 - PDP context is not optimized for signalling (default value) 1 - PDP context is optimized for signalling **Note:** a special form of the Set command, **+CGEQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined.
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**

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>,<Source Statistics Descriptor> ,<Signalling Indication><CR><LF>] **[…]** If no PDP context defined, it has no effect and **OK** result code returned.
AT+CGEQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQREQ:** <PDP_Type>,(list of supported <Traffic class>s), (list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s ,(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),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **+CGEQREQ:** "PPP",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **+CGEQREQ:** "IPV6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) **+CGEQREQ:** "IPV4V6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

3.4.4.7.17 *PDP Context Activate or Deactivate - +CGACT*

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

3.4.4.7.18 *PDP Context Modify - +CGCMOD*

CGCMOD action command syntax	
AT+CGCMOD= **[<cid>** **[,<cid>** **[,…]]]**	It has no effect and is included only for backward compatibility with landline modems **Possible Response(s):** OK ERROR The execution command used to modify the specified PDP context (s) with repect to QoS profiles and TFTs. After command has completed, the MT returns to V.250 online data state. If the requested modification for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

CGCMOD action command syntax	
	For EPS, the modification request for an EPS bearer resource will be answered by the network by an EPS bearer Modification request. The request must be accepted by the MT before the PDP context effectively changed. If no <cid>s are specified the activation form of the command modifies all active contexts. The test command returns a list of <cid>s associated with active contexts. **Defined Values** **<cid>:** a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
AT+CGCMOD=?	+CGCMOD: (list of <cid>s associated with active contexts)

3.4.4.7.19 *Call establishment lock - #CESTHLCK*

#CESTHLCK – Call establishment lock	
AT#CESTHLCK=[<closure_type>]	This command can be used to disable call abort before the DCE enters connected state. **<closure_type>:** 0 - Aborting the call setup by reception of a character is generally possible at any time before the DCE enters connected state (default) 1 - Aborting the call setup is disabled until the DCE enters connected state
AT#CESTHLCK?	Read command returns the current setting of <closure_type> parameter in the format: **#CESTHLCK: <closure_type>**
AT#CESTHLCK=?	Test command returns the supported range of values for the <closure_type> parameter.

3.4.4.7.20 *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>** specified, the addresses for all defined contexts are returned. **<PDP_addr>** - a string that identifies the terminal in an

+CGPADDR - Show PDP Address	
	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
Reference	3GPP TS 27.007

3.4.4.7.21 *3G Quality of Service Profile (Negotiated) - +CGEQNEG*

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

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
	0 - conversational 1 - streaming 2 - interactive 3 – background 4 - subscribed value <**Maximum bitrate UL**> - Maximum bitrate Up Link (kbits/s) 0 - subscribed value 1…8640 <**Maximum bitrate DL**> - Maximum bitrate down link (kbits/s) 0 - subscribed value 1…16000 <**Guaranteed bitrate UL**> - The guaranteed bitrate up link (kbits/s) 0 - subscribed value 1…8640 <**Guaranteed bitrate DL**> - the guaranteed bitrate down link (kbits/s) 0 - subscribed value 1…16000 <**Delivery order**> - SDU Delivery oreder 0 - no 1 - yes Other values are reserved <**Maximum SDU size**> - Maximum SDU size in octets 0 - subscribed value 1…1520 <**SDU error ratio**> - SDU error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” <**Residual bit error ratio**> - Residual bitt error ratio - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$ “0E0” “5E2” “1E2” “5E3”

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
	"4E3" "1E3" "1E4" "1E5" "1E6" "6E8" <**Delivery of erroneous SDUs**> - Delivery of erroneous SDUs 0 - no 1 – yes 2 – no detect Other values are reserved <**Transfer delay**> - Transfer delay (milliseconds) 0 – subscribed value 100…4000 <**Traffic handling priority**>: Traffic handling priority 0 - subscribed value 1…3
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=? +CGEQNEG: (1) OK AT+CGEQNEG=1 +CGEQNEG: 1,3,128,384,0,0,2,1500,"1E4","1E5",3,0,1 OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

3.4.4.7.22 *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 (factory default) 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.
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)
Note	
Example	AT+CEMODE=1 OK AT+CEMODE? +CEMODE: 1 OK

3.4.4.7.23 *Enter Data State - +CGDATA*

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

+CGDATA - Enter Data State	
Example	AT+CGDATA=? +CGDATA: (”PPP”) OK AT+CGDATA=”PPP”,1 OK
Reference	3GPP TS 27.007

3.4.4.8 Commands for Battery Charger

3.4.4.8.1 *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: <bcs>**=1 indicates that the battery charger supply is inserted and the battery is being recharged if necessary with it. Supply for **ME** operations is taken anyway from **VBATT** pins. **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.

+CBC - Battery Charge	
Example	AT+CBC +CBC: 0,75 OK
Note	The **ME** does not make differences between being powered by a battery or by a power supply on the **VBATT** pins, so it is not possible to distinguish between these two cases.
Reference	3GPP TS 27.007

3.4.5 3GPP TS 27.005 AT Commands for SMS and CBS

3.4.5.1 General Configuration

3.4.5.1.1 *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 AT+CSMS?

+CSMS - Select Message Service	
	+CSMS: 1,1,1,1 OK
Reference	3GPP TS 27.005; 3GPP TS 03.40/23.040; 3GPP TS 03.41/23.041

3.4.5.1.2 *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 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 "ME" – SMS memory storage in Flash "SM" – SIM SMS memory storage (default) **<mems>** - memory to which received SMs are preferred to be stored "ME" – SMS memory storage in Flash "SM" – SIM SMS memory storage (default) 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>**

+CPMS - Preferred Message Storage	
	Where: <memr>, **<memw>** and **<mems>** are the selected storage memories for reading, writing and storing respectively.
AT+CPMS=?	Test command reports the supported values for parameters **<memr>**, **<memw>** and **<mems>**
Example	AT+CPMS? +CPMS: "ME",27, 50,"ME",27, 50,"SR",1,20 OK AT+CPMS="SM","ME","SM" +CPMS: 1,20,27, 50,1,20 OK AT+CPMS? +CPMS: "SM",1,20,"ME",27, 50,"SM",1,20 OK *(You have 1 out of 255 SMS SIM positions occupied)*
Reference	3GPP TS 27.005

3.4.5.1.3 *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 3.40/23.040 and 3GPP TS 3.41/23.041 (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

3.4.5.2 Message Configuration

3.4.5.2.1 *Service Center Address - +CSCA*

+CSCA -Service Center Address	
AT+CSCA=<number>	Set command sets the Service Center Address to use for mobile originated SMS transmissions.

+CSCA -Service Center Address	
[,<type>]	**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 "+") **Note:** to use the SM service, is mandatory to set a Service Center Address at which service requests directed. **Note:** in Text mode the settings is used by send & 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

3.4.5.2.2 *Select service for MO SMS services - +CGSMS*

+CGSMS – Select service for MO SMS messages	
AT+CGSMS=[<service>]	The set command 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 2 – Packet Domain preferred (use circuit switched if GRPS is not available) (factory default)

+CGSMS – Select service for MO SMS messages	
	3 - Circuit switched preferred (use Packet Domain if circuit switched not available) **Note:** If SMS transfer via Packet Domain fails, <service> parameter 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

3.4.5.2.3 *EPS – Network Registarion Status - +CEREG*

+CEREG – Network Registarion Status	
+CEREG=[<n>]	The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in E-UTRAN, or unsolicited result code. **+CEREG:** <stat>[,[<tac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in E-UTRAN. The parameters <AcT>, <tac> and <ci> are sent only if available.The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes. Refer subclause 9.2 for possible <err> values. **Note:** If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services. **Possible response(s):** **+CME ERROR: <err>**
+CEREG?	**Defined values:** **<n>:** integer type 0 - disable network registration unsolicited result code 1 - enable network registration unsolicited result code **+CEREG: <stat>** 2 - enable network registration and location information unsolicited result code **+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]** 3 - enable network registration, location information and EMM cause value information unsolicited result code. **+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]** **<stat>:** integer type; indicates the EPS registration status 0 - not registered, MT is not currently searching an operator to register to. 1 - registered, home network.

+CEREG – Network Registarion Status	
	2 - not registered, but MT is currently trying to attach or searching an operator to register to. 3 - registration denied. 4 - unknown (e.g. out of E-UTRAN coverage). 5 - registered, roaming. 6 - registered for "SMS only", home network (not applicable) 7 - registered for "SMS only", roaming (not applicable). 8 - attached for emergency bearer services only (See NOTE 2). 9 - registered for "CSFB not preferred", home network (not applicable). 10 - registered for "CSFB not preferred", roaming (not applicable). **Note 2:** 3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is considered as attached for emergency bearer services. **<tac>:** string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal). **<ci>:** string type; four byte E-UTRAN cell ID in hexadecimal format. **<AcT>:** integer type; indicates the access technology of the serving cell. 0 - GSM (not applicable) 1 - GSM Compact (not applicable) 2 - UTRAN (not applicable) 3 - GSM w/EGPRS (see NOTE 3) (not applicable) 4 - UTRAN w/HSDPA (see NOTE 4) (not applicable) 5 - UTRAN w/HSUPA (see NOTE 4) (not applicable) 6 - UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable) 7 - E-UTRAN **Note 3:** 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. **Note 4:** 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA. **<cause_type>:** integer type; indicates the type of <reject_cause>. 0 - Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 [83] Annex A. 1 - Indicates that <reject_cause> contains a manufacturer-specific cause. **<reject_cause>:** integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>. **+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]]**
+CEREG=?	Test command returns values supported as a compound value. **+CEREG: (list of supported <n>s)**
Reference	3GPP TS 27.007

3.4.5.2.4 *PDP Context Read Dynamic Parameters +CGCONTRDP*

+CGCONTRDP parameter command syntax	
AT+CGCONTRDP **=** **[<p_cid>]**	**Possible response(s):** **+CGCONTRDP:** <p_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:** <p_cid>,<bearer_id>,<apn>[,<ip_addr>, <subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr> [,<PCSCF_prim_addr>[,<PCSCF_sec_addr>]]]]][…]] **Description:** 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 <p_cid>. If the context can't be found an ERROR response is returned. If the parameter <p_cid> omitted, the relevant information for all established PDP contexts returned. **NOTE:** The dynamic part of the PDP context will only exist if established by the network. The test command returns a list of <p_cid>s associated with active contexts. **Defined values:** **<p_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. The <p_cid> rage is: (1 <= <p_id> <= 24) or (100 <= <p_id> <= 179) **<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

+CGCONTRDP parameter command syntax	
	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.
+CGCONTRDP=?	**+CGCONTRDP:** (list of <p_cid>s associated with active contexts)

3.4.5.2.5 *Secondary PDP Context Read Dynamic Parameters - +CGSCONTRDP*

+CGSCONTRDP - parameter command syntax	
AT+CGSCONTRDP= [<cid>]	**Possible response(s):** **+CGSCONTRDP:**<cid>,<p_cid>,<bearer_id>[<CR><LF> **+CGSCONTRDP:** <cid>, <p_cid>,<bearer_id> […]] The execution command returns <p_cid> and <bearer_id> for a given <cid>. If the context cannot be found an ERROR response returned.If the parameter <cid> omitted, the <cid>, <p_cid> and <bearer_id> returned for all established PDP contexts. In EPS, the Traffic Flow parameters returned. **NOTE:** Parameters for network initiated PDP contexts returned as well. The dynamic part of the PDP context will only exist if established by the network. **Defined values:** **<cid>** a numeric parameter which specifies a particular PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. **<p_cid>** a numeric parameter which specifies a particular PDP context definition or default EPS context Identifier which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface. **<bearer_id>** a numeric parameter which identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.
+CGSCONTRDP=?	**+CGSCONTRDP:** (list of <cid>s associated with active contexts) The test command returns a list of <cid>s associated with active contexts.

3.4.5.2.6 *Traffic Flow Template Read Dynamic Parameters - +CGTFTRDP*

+CGTFTRDP - parameter command syntax	
AT+CGTFTRDP= [<cid>]	**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> […]] The execution command returns the relevant information about Traffic Flow Template of <cid> together with the

+CGTFTRDP - parameter command syntax	
	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. **<cid>:** a numeric parameter which specifies a particular PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands). 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)

+CGTFTRDP - parameter command syntax	
	1 - Uplink 2 - Downlink 3 - Bidirectional (Used for Uplink and Downlink) **<NW packet filter Identifier>** a numeric parameter. The value range is from 1 to 16. In EPS the value is assigned by the network when established **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+CGTFTR=?	**+CGTFTRDP:** (list of <cid>s associated with active contexts) The test command returns a list of <cid>s associated with active contexts.

3.4.5.2.7 *Define EPS Quality of Service +CGEQOS*

+CGEQOS - parameter command syntax	
AT+CGEQOS= [<cid> [,<QCI> [,<DL_GBR>, <UL_GBR> [,<DL_MBR>,<UL_ MBR]]]]	**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/GPRS 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 [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]) **<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]) **<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]) **<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])

+CGEQOS - parameter command syntax	
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)

3.4.5.2.8 *EPS Quality of Service Read Dynamic Parameters - +CGEQOSRDP*

+CGEQOSRDP - parameter command syntax	
AT+CGEQOSRDP= [<cid>]	**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>][…]] **Description:** 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 founded an ERROR response is returned. If the parameter <cid> omitted, the Quality of Service parameters for all established PDP contexts returned. **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] value range for guranteed bit rate Traffic Flows [5 – 9] value range for 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 indicates UL GBR 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]) **<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])

+CGEQOSRDP - parameter command syntax	
	<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])
AT+CGEQOSRDP=?	+CGEQOSRDP: (list of <cid>s associated with active contexts) The test command returns a list of <cid>s associated with active contexts. Parameters of both network and MT/TA initiated PDP contexts returned.

3.4.5.2.9 *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>** - depending on the command or result code: first octet of 3GPP TS 03.40/23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. **<vp>** - depending on SMS-SUBMIT **<fo>** setting: 3GPP TS 03.40/23.040 TP-Validity-Period either in integer format (default 167) or in quoted time-string format. **<pid>** - 3GPP TS 03.40/23.040 TP-Protocol-Identifier in integer format. **<dcs>** - depending on the command or result code: 3GPP TS 03.38/23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme. **Note:** the current settings are stored through **+CSAS**
AT+CSMP?	Read command reports the current setting in the format: **+CSMP: < fo>,<vp>,<pid>,<dcs>**
AT+CSMP=?	Test command returns the **OK** result code.
Example	*Set the parameters for an outgoing message with 24 hours of validity period and default properties:* AT+CSMP=17,167,0,0 OK
Reference	3GPP TS 27.005; 3GPP TS 03.40/23.040; 3GPP TS 03.38/23.038

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

3.4.5.2.11 *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 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,"",""

+CSCB -Select Cell Broadcast Message Types	
	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 03.41/23.041, 3GPP TS 03.38/23.038.

3.4.5.2.13 *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:** <message_identifier>,<serial_number>,<warning_type>. 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

3.4.5.2.14 *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(le9x0 allow to store up to 5). **Note:** certain settings may not be supported by the SIM. Therefore, the settings always saved to the 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

3.4.5.2.15 *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 (le9x0 allow to store up to 5). **Note:** certain settings may not be support 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

3.4.5.3 Message Receiving and Reading

Note: Concatenated SMS is not supported in text mode.
It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.

3.4.5.3.1 *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 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 may 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 an indication via 100 ms break is issued when a SMS is received while the module is in GPRS online mode. It enables the hardware ring line for 1 s. too. **Note:** In <mode> field, "3" not supported. **<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

+CNMI - New Message Indications To Terminal Equipment	
	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 03.40/23.040 ***<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 GSM03.38/23.038 default alphabet is used and **<fo>** indicates that GSM03.40/23.040 TP-User-Data-Header-Indication is not set (bit 6 of **<fo>** is 0), each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used or **<fo>** indicates that GSM03.40/23.040 TP-User-Data-Header-Indication is set (bit 6 of **<fo>** is 1), each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) Class 2 messages and messages in the message waiting indication group (stored message) result in indication as defined in **<mt>=1**. Acknowledge for the received SMS-DELIVER SM is sent to network immediately when +CSMS <service> is set to '0' or when +CSMS <service> is set to '1', acknowledge is sent via +CNMA command during predefine time-out, an error is sent to network in case timeout expire, Next +CMT response is depend on acknowledge of current received +CMT response in case +CSMS <service> parameter set to '1'.

+CNMI - New Message Indications To Terminal Equipment	
	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 GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) **<ds>** - SMS-STATUS-REPORTs reporting option 0 - status report receiving is not reported to the **DTE** and messages are stored 1 - the status report is sent to the **DTE** with the following unsolicited result code: **(PDU Mode)** **+CDS: <length><CR><LF><PDU>** **where:** **<length>** - PDU length **<PDU>** - message PDU **(TEXT Mode)** **+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>** **where:** **<fo>** - first octet of the message PDU **<mr>** - message **Reference** number

+CNMI - New Message Indications To Terminal Equipment	
	<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 Acknowledge for the received SMS-STATUS-REPORT SM is sent to network immediately when +CSMS <service> is set to '0' or when +CSMS <service> is set to '1', acknowledge is sent via +CNMA command during pre-defined timeout, an error is sent to network in case timeout expire, Next +CDS response is depend on acknowledge of current received +CDS response in case +CSMS <service> parameter set to '1'. 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** startup is suggested to check whether new

+CNMI - New Message Indications To Terminal Equipment	
	messages have reached the device meanwhile with command **AT+CMGL=0** that lists the new messages received.

3.4.5.3.2 *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 3.40/23.040 **(Text Mode)** **Parameter:** **<stat>** "REC UNREAD" - new message "REC READ" - read message "STO UNSENT" - stored message not yet sent "STO SENT" - stored message already sent "ALL" - all messages.

+CMGL - List Messages	
	Each message to be listed is represented in the format (the information written in italics will be present depending on +CSDH last setting): **+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>*[,<tooa/toda>,<length>]*<CR><LF> <data>** **Where:** **<index>** - message position in the storage **<stat>** - message status **<oa/da>** - originator/destination address, string type , 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 GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) Each message delivery confirm is represented in the format**:** **+CMGL: <index>,<stat>,<fo>,<mr>,,,<scts>,<dt>,<st>** **Where:** **<index>** - message position in the storage **<stat>** - message status **<fo>** - first octet of the message PDU **<mr>** - message **Reference** number **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU **Note:** If 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 - List Messages	
	+CMGL: 1,"REC UNREAD","+821020955219",,"07/07/26,20:05:11+36" SMS Test message +CMGL: 2,"REC UNREAD","+821020955219",,"07/07/26,20:05:58+36" SMS Test message... +CMGL: 3,"REC UNREAD","+821020955219",,"07/07/26,20:06:37+36" SMS Test Message.. +CMGL: 4,"REC UNREAD","+821020955219",,"07/07/26,20:07:43+36" TEST MESSAGE.. +CMGL: 5,"REC UNREAD","+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE OK AT+CMGF=0 *Set PDU mode* OK AT+CMGL=2 +CMGL: 0,2,,24 07912801929190301164 0A811056789282 0000A70CF4F29C0E6A97E7F3F0B90C +CMGL: 1,2,,21 07912801929190301164 0A811051652970 0000A709027A794E77B95C2E +CMGL: 26,2,,17 08812801009901025911640A811056789282 0014A704C7D1B1DB OK
Reference	3GPP TS 27.005

3.4.5.3.3 *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:**

+CMGR - Read Message	
	<stat> - status of the message 0 - new message 1 - read message 2 - stored message not yet sent 3 - stored message already sent **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS. **<length>** - length of the PDU in bytes. **<pdu>** - message in PDU format according to 3GPP TS 3.40/23.040. The status of the message and entire message data unit **<pdu>** 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>,,,<scts>,<dt>,<st>** **where:** **<stat>** - status of the message "REC UNREAD" - new received message unread "REC READ" - received message read "STO UNSENT" - message stored not yet sent "STO SENT" - message stored already sent **<*fo*>** - first octet of the message PDU **<mr>** - message **Reference** number **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU **<*pid*>** - Protocol Identifier **<*dcs*>** - Data Coding Scheme **<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 selected with command +CSCS.

+CMGR - Read Message	
	<***sca***> - Service Centre number <***tooa***>,<***toda*** >,<***tosca***> - type of number **<oa>**,**<da>**,<***sca***> 129 - number in national format 145 - number in international format (contains the "+") <***length***> - text length **<data>** - TP-User_data • If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or LE9x0 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 AT+CMGR=1 +CMGR: 2,,21 07912801929190301164 0A8110516529700000A709027A794E77B95C2E OK AT+CMGF=1 OK AT+CMGR=3 +CMGR: "REC READ","+821020955219",,"07/07/19,10:06:34+36" test message/..... OK
Reference	3GPP TS 27.005

3.4.5.3.4 *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).

+CNMA – New Message Acknowledgement	
	Either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the 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 received from network.* +CMT: "",70 0681600058542600048098060 0F170110370537284… *Send positive acknowledgement to the network.* AT+CNMA=0 OK *Message received from network.* +CMT: "",70 0681600058542600048098060 0F170110370537284… *Send negative acknowledgement (Unspecified error) to the network.*

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

3.4.5.4 Message Sending and Writing

3.4.5.4.1 *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** **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 octet length 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 reported. **Note:** to ensure that during the command execution, which may take several seconds, no other SIM interacting commands issued, care must taken.
(Text Mode) **AT+CMGS=** **<da>** **[,<toda>]**	**(Text Mode)** Execution command sends to the network a message. **Parameters:**

+CMGS - Send Message	
	<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 GSM03.38/23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 03.40/23.040 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 03.40/23.040 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 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.

+CMGS - Send Message	
	Note: if message sending fails for some reason, an error code 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 save a concatenation of at most 16 SMs; the maximum number of chars depends on the <dcs>: 2448 chars; 2144 chars if 8-bit is used;1072 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 AT+CMGS=18 > 08812801009901025911550781102090551 2F90000A704F4F29C0E +CMGS: 124 OK *Set text mode* AT+CMGF=1 AT+CSMP=17,167,0,0 AT+CMGS=”01090255219”,129 >TEST MESSAGE +CMGS:125 OK
Reference	3GPP TS 27.005

3.4.5.4.2 *Send Message from Storage - +CMSS*

+CMSS - Send Message From Storage	
AT+CMSS= <index>[,<da> [,<toda>]]	Execution command sends to the network a message which 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: **+CMSS: <mr>[, <scts>]** (Note: Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned) **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 resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	AT+CMGF=1 OK AT+CMGW="0165872928" > test message... +CMGW: 28 AT+CMSS=28 +CMSS: 136 OK
Reference	3GPP TS 27.005

3.4.5.4.3 *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 reported. **Note:** to ensure that during the command execution, no other SIM interacting commands issued care must be taken of.
(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). **<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

+CMGW - Write Message To Memory	
	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 GSM03.38/23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 03.40/23.040 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 03.40/23.040 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 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 reported. **Note:** care will taken to ensure that during the command execution, no other SIM interacting commands issued. **Note:** it is possible to save a concatenation of at most 16 SMs; the maximum number of chars depends on the <dcs>: 2448 chars; 2144 chars if 8-bit is used;1072 chars if UCS2 is used Note: in text mode, not only SUBMIT messages can be stored in SIM, but also

+CMGW - Write Message To Memory	
	DELIVER messages. The type of saved message depends upon the current <fo> parameter (see +CSMP). For a DELIVER message, current <vp> parameter (see +CSMP) is used to set the message Service Centre Time Stamp <scts>, so it has to be an absolute time string, e.g. "09/01/12,11:15:00+04". SUBMIT messages can only be stored with status "STO UNSENT" or "STO SENT"; DELIVER messages can only be stored with status "REC UNREAD" or "REC READ".
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 > 08812801009901025911550781102090551 2F90000A704F4F29C0E +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
Note	To avoid malfunctions is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

3.4.5.4.4 *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

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

3.4.5.4.5 *More Message to Send - +CMMS*

+CMMS – More Message to Send	
AT+CMMS=[<n>]	Set command controls the continuity of SMS relay protocol link. Multiple messages can be sent much faster when link 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.
AT+CMMS?	Read command reports the current value of the parameter <n>.

+CMMS – More Message to Send	
AT+CMMS=?	Test command reports the supported value of <n> parameter.
Reference	3GPP TS 27.005

3.4.5.4.6 *Send SMS command - +CMGC*

+CMGC - Send SMS command

(PDU Mode)
AT+CMGC=<length><CR>
PDU is given<Ctrl-Z/ESC>

(PDU Mode)

Execution command sends command message from a TE to the network (SMS-COMMAND).

Parameter:

<length> - Length of the actual TP data unit in octets. (Excluding the SMSC address octets).

<PDU> - Message header and contents in PDU mode format. See description in Table:

Reference	Description	Length
<SCA>	Service Center address: 1 BYTE: length (number of followed octets). Mandatory 1 BYTE: <tosca> - value between 128-255	1, 3-12 BYTES (When length is 1, length BYTE = 0)
<FO>	First Octet.	1 BYTE

Bit/s	Reference	Description
0-1	Message-Type-Indicator	Parameter describing the message type. 1 0 SMS-COMMAND (in the direction MS to SC)
5	TP-Status-Report-Request	Parameter indicating if a status report is requested by the MS 0 A status report is not requested 1 A status report is requested
6	TP-User-Data-Header-Indicator	Parameter indicating whether the beginning of the User Data field contains a Header in addition to the short message or contains only the short message 0 The TP-UD field contains only the short message 1 The beginning of the TP-UD field contains a Header in addition to the short message

<TP-MR>	Message Reference. An integer representation of a reference number of the SM submitted to the SC by the MS. Values between 0-255.	1 BYTE
<TP-PID>	Protocol-Identifier. Values between 0-255.	1 BYTE
<TP-CT>	Command Type	1 BYTE
<TP-MN>	Message Number	1 BYTE
<TP-DA>	Destination address formatted according to the formatting rules of address fields.	2-12 BYTES
<TP-CDL>	Command data length	1 BYTE
<TP-CD>	Command data	0-156 BYTES

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**

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:

+CMGC: <mr>[, <ackpdu>]

Where:
<mr> - TP-Message-Reference in integer format.
<**ackpdu**> - RP-User-Data element of RP-ACK PDU (When +CSMS <service> value is 1 and network supports).

Note: if message sending fails for some reason, an error code reported.

	Note: care taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands issued.
(Text Mode) **AT+CMGC=** **<fo>,<ct>[,** **<pid>[,<mn>[,** **<da>[,<toda>]]]]><CR>Text can be entered<ctrl-Z/ESC>**	**(Text Mode)** Execution command sends to the network a message. **Parameters:** **<fo>** - First octet of 3GPP TS 23.040 SMS-COMMAND in integer format. **<ct>** - TP-Command-Type in integer format specified in 3GPP TS 23.040. Default value is 0. **<pid>** - TP-Protocol-Identifier in integer format. Range 0-255. Default value is 0. **<mn>** - TP-Message-Number in integer format. **<da>** - TP-Destination-Address-Value field in string format represented in the currently selected character set (see +CSCS). **<toda>** - TP-Destination-Address Type-of-Address octet: 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)** **Note:** the **DCD** signal shall be in **ON** state while text 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: **+CMGC: <mr>[, <scts>]** **Where:** **<mr>** - TP-Message-Reference in integer format. <**scts**> - TP-Service Centre Time Stamp in Time String Format. **Note:** if message sending fails for some reason, an error code reported. **Note:** care taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands issued.

AT+CMGC=?	Test command returns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGC: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	*Set PDU mode* AT+CMGF=0 AT+CMGC=15 > 07917952140230f202440002340C917952446585600100 +CMGC: 124 OK *Set text mode* AT+CMGF=1 AT+CSMP=17,167,0,0 AT+CMGS=”01090255219”,129 > Text Message is entered <CTRL-Z> +CMGS:125 OK at+cmgc=2,1,0,125 > Text Message is entered <CTRL-Z> OK
Reference	3GPP TS 27.005

3.4.6 Custom AT Commands

3.4.6.1 Configuration AT Commands

3.4.6.1.1 *Hardware Identification - #HWREV*

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

3.4.6.1.2 *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.
Example	AT#CGMI #CGMI: Telit OK

3.4.6.1.3 *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.
Example	AT#CGMM #CGMM:LE920 OK

3.4.6.1.4 *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.
Example	AT#CGMR #CGMR: 08.01.005 OK

3.4.6.1.5 *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[=<snt>]	Set command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE connected to. **Parameter:** **<snt> -** indicating the serial number type that has been requested. 0 returns <sn> 1 returns the IMEI (International Mobile station Equipment Identity)

#CGSN - Product Serial Number Identification	
	2 returns the IMEISV (International Mobile station Equipment Identity and Software Version number) 3 returns the SVN (Software Version Number) **where:** **<sn> -** Indicate the product "serial number", identified as the IMEI of the mobile, with command echo. **<imei> -** string type in decimal format indicating the IMEI. . IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit). Character set used in <imei> is as specified by command Select TE Character Set +CSCS. **<imeisv> -** string type in decimal format indicating the IMEISV. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits). Character set used in <imeisv> is as specified by command Select TE Character Set +CSCS. **<svn>** - string type in decimal format indicating the current SVN which is a part of IMEISV. Character set used in <svn> is as specified by command Select TE Character Set +CSCS.
AT#CGSN=?	Test command returns the **OK** result code.
Example	AT#CGSN #CGSN: 358677008900540 OK

3.4.6.1.6 *Select GSM Hexadecimal Representation - #CSCSEXT*

#CSCSEXT - Select GSM Hexadecimal Characters Representation	
AT#CSCSEXT= <mode>	Set commands enable/disable the hexadecimal characters representation while character set, one selected with **+CSCS**, is GSM. (For example, 4142 equals two 7-bit characters with decimal values 65,66). **Parameter:** <mode> - 0 – Disable HEX representation (Factory default). 1 – Enable HEX representation.
AT#CSCSEXT?	Read command returns the current value of the <**mode**> parameter.
AT#CSCSEXT=?	Test command returns the supported values for parameter **<mode>**.
Example	AT+CSCS=? +CSCS: ("GSM","IRA","8859-1","PCCP437","UCS2") OK

#CSCSEXT - Select GSM Hexadecimal Characters Representation	
	AT+CSCS="GSM" OK AT#CSCSEXT? #CSCSEXT: 0 OK AT+CPBW=1,"8475763000",129,"Lin Zhao" OK at+cpbr=1 +CPBR: 1,"8475763000",129,"Lin Zhao","","",0,"","" OK at+cmgw=8475763000 > test #CSCSEXT +CMGW: 8 OK at+cmgr=8 +CMGR: "STO UNSENT","8475763000","Lin Zhao" test #CSCSEXT OK AT#CSCSEXT=1 OK AT+CPBR=1 +CPBR: 1,"8475763000",129,004C006E006E0020005A00680061006F OK at+cmgr=8 +CMGR: "STO UNSENT","38343735373633303030","004C006E006E0020005A00680061006F" 74657374202343534353455855420 OK

3.4.6.1.7 *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

3.4.6.1.8 *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.
Example	AT#CCID #CCID: 8982050702100167684F OK

3.4.6.1.9 *Serial and Software Version Number - #IMEISV*

+IMEISV - Serial and Software Version Number	
AT#IMEISV	Execution command returns returns the IMEISV (International Mobile station Equipment Identity and Software Version number).
Example	At#imeisv #IMEISV: 3540660590080701

3.4.6.1.10 *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.

3.4.6.1.11 *Change Audio Path - #CAP*

#CAP - Change Audio Path	
AT#CAP=[<n>]	It has no effect and is included only for backward compatibility. **Parameter:** **<n>** - audio path 0. Not supported 1. Handsfree MIC1 – SPKR1 SPKR2 (automatic DSP profile 1 Hands Free) (factory default) 2. Headset – MIC2 – SPKR1 SPKR2 (automatic DSP profile 2 Headset) **Note:** • The command work only for Analog mode(#DVI = 0) • The audio path are mutually exclusive, enabling one disables the other. • When changing the audio path, the volume level is set at the previously stored value for that audio path (see +CLVL).
AT#CAP?	Read command reports the active audio path in the format: **#CAP: <n>.**
AT#CAP=?	Test command reports the supported values for the parameter **<n>.**

3.4.6.1.12 *Handsfree Microphone Gain - #HFMICG*

#HFMICG - Handsfree Microphone Gain	
AT#HFMICG= [<level>]	Set command sets the handsfree analogue microphone input gain. Parameter: **<level>**: handsfree microphone input gain 0..7 - handsfree microphone gain (+7dB/step, factory default=1) *Note: This parameter is saved in NVM issuing AT&W command.*
AT#HFMICG?	Read command returns the current handsfree microphone input gain, in the format:

#HFMICG - Handsfree Microphone Gain	
	#HFMICG: <level>
AT#HFMICG=?	Test command returns the supported range of values of parameter **<level>**.

3.4.6.1.13 *Handset Microphone Gain - #HSMICG*

#HSMICG - Handset Microphone Gain	
AT#HSMICG= [<level>]	It has no effect and is included only for backward compatibility. **Parameter:** **<level>**: handset microphone input gain 0..7 - handset microphone gain (+6dB/step, factory default = 0) **Note: Effected on analog mode only**
AT#HSMICG?	Read command returns the current handset microphone input gain, in the format: **#HSMICG: <level>**
AT#HSMICG=?	Test command returns the supported range of values of parameter **<level>**.

3.4.6.1.14 *Handsfree Receiver Gain - #HFRECG*

#HFRECG - Handsfree Receiver Gain	
AT#HFRECG= <level>	Set command sets the handsfree analogue output gain Parameter: **<level>**: handsfree analogue output gain 0..6 - handsfree analogue output (-2dB/step, factory default=0) *Note: This command Influence on +CRSL +CLVL gain dB and another output gain.* *Note: This parameter is saved in NVM issuing AT&W command.* **Note: Effected on analog mode only**
AT#HFRECG?	Read command returns the current handsfree analog output gain, in the format: **#HFRECG: <level>**
AT#HFRECG=?	Test command returns the supported range of values of parameter **<level>**.

3.4.6.1.15 *Handset Receiver Gain - #HSRECG*

#HSRECG - Handset Receiver Gain	
AT#HSRECG=<level>	It has no effect and is included only for backward compatibility. **Parameter**: **<level>**: handset analogue output gain 0..6 - handset analogue output (-3dB/step, default value = 0) Note: This parameter is saved in NVM issuing A*T&W command.*
AT#HSRECG?	Read command returns the current handset analog output gain, in the format: **#HSRECG: <level>**
AT#HSRECG=?	Test command returns the supported range of values of parameter **<level>**.

3.4.6.1.16 *Singnalling Tones Mode - #STM*

#STM - Signalling Tones Mode	
AT#STM=[<mode>]	Set command enables/disables the signalling tones output on the audio path selected with **#SRP** command (LE9x0 supported by fix SRP 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>**.

3.4.6.1.17 *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)

#ADSPC - Audio DSP Configuration	
	1. Hands Free 2. Headset 3. Handset 4. Speaker phone Bluetooth 5. TTY **< ecns mode >** 0. Disables ECNS mode (default) 1. Enables ECNS. **Note:** • On Automatic mode: Digital: 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. • The <n> = 5 "TTY" only configured DSP profile to "Full TTY" mode , to enable TTY mode and another TTY mode using by #TTY command.
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>.

3.4.6.1.18 *Headset GPIO Select - #HSGS*

#HSGS - Headset GPIO Select	
AT#HSGS=<n>	Set command select the Headset GPIO for headset detect **Parameter:** **<n>**: GPIO number for headset detect, Valid range is “any input/output pin” (see “Hardware User’s Guide”.) (factory default=0) **Note:** • See on “Hardware User’s Guide” Headset detection HW instructions. • Default value is 0, which means no Headset pin set. • This command Influence on #GPIO and vice versa. • This parameter is saved in NVM.
AT#HSGS?	Read command returns the current status of headset detection in the format:

#HSGS - Headset GPIO Select	
	When <n> not Zero **#HSGS:<n>,<status>** <n> equal to Zero **#HSGS:<n>** **where:** **<n> -** Selected the GPIO number. **<status> -** 0- Not connected (Logic 'L' voltage level) 1- Connected (Logic 'H' voltage level)
AT#HSGS=?	Test command returns the supported range of values of parameter **<n>**.

3.4.6.1.19 *DVI Speaker Volume Level - #PCMRXG*

#PCMRXG – DVI Speaker Volume Level	
AT#PCMRXG=<RX_VOL>	Set command sets the 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
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>**

3.4.6.1.20 *Set delay before close the PCM Clock/SYNC - #PCMDELAY*

#PCMDELAY – Set delay before close the PCM Clock/SYNC	
AT#PCMDELAY= < delay >	Set command Set delay before close the PCM Clock/SYNC Parameters: **<delay>** - time in seconds to wait before close the PCM Clock/SYNC. (default 0 sec)

#PCMDELAY – Set delay before close the PCM Clock/SYNC	
	Note : • Delay after the voice call only. • This parameter is saved in NVM issuing AT&W command.
AT#PCMDELAY?	Read command returns the current **< delay** parameters, in the format: **# PCMDELAY:< delay >**
AT#PCMDELAY =?	Test command returns the range of supported values for all the sub parameters.

3.4.6.1.21 *Extended Digital Voiceband Interface - #DVICLK*

#DVICLK - Digital Voiceband Interface Extension	
AT#DVICLK=<clock >[,<samplerate>]	Set command configures and activates the DVICLK clock signal and the Digital Voiceband Interface Parameters: **<clock>** 0 – Disable (factory default) 128 – DVI Clock activated at 128KHz 256 – DVI Clock activated at 256KHz 512 – DVI Clock activated at 512KHz 1024 – DVI Clock activated at 1024KHz 2048 – DVI Clock activated at 2048KHz 4096 – DVI Clock activated at 4096KHz **<samplerate>** 0 - audio scheduler sample rate 8KHz (factory default) 1 - audio scheduler sample rate 16KHz Note : • On Active/MT/MO Voice Call return Error. • Clock 4096KHz don't supported with Sample Rate 8KHz • #DVICFG return Error, when <clock> enabled. • On Clock value zero (0) the clock rate and sample rate taken from #DVICFG <**clock**> value. • This parameter is saved in NVM issuing AT&W command.
AT#DVICLK?	Read command reports last setting, in the format: **#DVICLK:< clock > ,<samplerate>**

#DVICLK - Digital Voiceband Interface Extension	
AT#DVICLK =?	Test command returns the range of supported values for all the sub parameters.

3.4.6.1.22 *Digital Voiceband Interface Configuration- #DVICFG*

#DVICFG – DVI CONFIGURATION	
AT#DVICFG=[<clock>[,<decoder pad>[,<decoder format>[, <encoder pad>[,<encoder format>]]]]]	Set command sets the DVI configuration Parameter: <**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 parameters are saved in the extended profile . • #DVICFG return Error, when #DVICLK enabled. • LE9x0 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=?	Test command returns the supported range of values of parameter <**clock**>, <**decoder pad**>,<**decoder format**>,<**encoder pad**>,<**encoder format**>.

3.4.6.1.23 *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.

3.4.6.1.24 *Audio Codec - #CODEC*

#CODEC - Audio Codec	
AT#CODEC=[<codec>]	Set command sets the audio codec mode. **Parameter:** **<codec>** 0 - all the codec modes are enabled (equivalent to the setting 255) (factory default) 1.. s Sum of integers each representing a specific codec mode: 1 - FR, full rate mode enabled 2 - EFR, enhanced full rate mode enabled 4 - HR, half rate mode enabled 8 - AMR-FR, AMR full rate mode enabled 16 - AMR-HR, AMR half rate mode enabled 32 - GSM-AMR-WB, GSM AMR Wide band mode enabled 64 - UMTS-AMR-NB, UMTS AMR Narrow band mode enabled 128 - UMTS-AMR-WB, UMTS AMR Wide band mode enabled **Note:** The codec setting is saved in the profile parameters. **Note:** codecs 8, 16, 32, 128 if not added to mask will not be used by network **Note:** codecs 1, 2, 4, 64 if not added to mask can be used by network but call will be dropped

AT#CODEC?	Read command returns current audio codec mode in the format: #CODEC: <codec>
AT#CODEC=?	Test command returns the range of available values for parameter <codec>
Example	AT#CODEC=14 OK *sets the codec modes HR (4), EFR (2) and AMR-FR (8)*

3.4.6.1.25 *Audio Codec - #CODECINFO*

AT#CODECINFO - Audio Codec	
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**>. **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
32 - GSM-AMR Wide band mode
64 - UMTS-AMR Narrow band mode
128 - UMTS-AMR Wide band mode
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 data 9.6

<codec_set>
0 - all codecs enabled
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 - AMRWB, GSM-AMR Wide band mode enabled
64 - UAMRNB, UMTS-AMR Narrow band mode enabled
128 - UAMRWB, UMTS-AMR Wide band mode enabled

(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 AMRWB - GSM-AMR Wide band mode enabled UAMRNB - UMTS-AMR Narrow band mode enabled UAMRWB - UMTS-AMR Wide band mode enabled 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 **<codec_setn>** 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 AMRWB - GSM-AMR Wide band mode enabled UAMRNB - UMTS-AMR Narrow band mode enabled UAMRWB - UMTS-AMR Wide band mode enabled **Note:** The command refers to codec information in speech call and to channel mode in data/fax call. **Note:** if AT#CODEC is 0, the reported codec set for **<format>=0** is 0 (all codec).
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**>.
Example	

3.4.6.1.26 *Select Ringer Path - #SRP*

#SRP - Select Ringer Path	
AT#SRP=[<n>]	It has no effect and is included only for backward compatibility.

#SRP - Select Ringer Path	
	Parameter: **<n>** - ringer path number 0 - sound output towards current selected audio path (see command #CAP) 1 - sound output towards handsfree 2 - sound output towards handset 3 - sound output towards Buzzer Output pin GPIO7 **Note:** #ADSPC(Audio DSP Configuration) commands doesn't Influence on Ringer Path. **Note:** In order to use the Buzzer Output an external circuitry must be added to drive it properly from the GPIO7 pin, furthermore the GPIO7 pin direction must be set to Buzzer output (Alternate function); see command #GPIO.
AT#SRP?	Read command reports the selected ringer path in the format: **#SRP: <n>.**
AT#SRP=?	Test command reports the supported values for the parameter <n>.

3.4.6.1.27 *Select Ringer Sound - #SRS*

#SRS - Select Ringer Sound	
AT#SRS= **[<n>,<tout>]**	Set command sets the ringer sound. **Parameters:** **<n>** - ringing tone 0 - current ringing tone 1..max - ringing tone number, where max can be read by issuing the Test command AT#SRS=?. **<tout>** - ringing tone playing time-out in seconds. 0 - ringer is stopped (if present) and current ringer sound is set. 1..60 - ringer sound playing for <tout> seconds and, if <n> > 0, ringer sound <n> is set as default ringer sound. **Notes:** • 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. • 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. • If command is issued with <n> = 0 and <tout> > 0 then the current ringing tone is played. • If both <n> and <tout> are 0 then the default ringing tone is set as current and ringing is stopped.

#SRS - Select Ringer Sound	
	• If all parameters are omitted then the behavior of Set command is the same as Read command
AT#SRS?	Read command reports current selected ringing and its status in the form: #SRS: <n>,<status> **where:** **<n>** - ringing tone number 1..max **<status>** - ringing status 0 - selected but not playing 1 - currently playing
AT#SRS=?	Test command reports the supported values for the parameters <n> and <tout>

3.4.6.1.28 *Audio Profile Factory Configuration - #PRST*

#PRST - Audio Profile Factory Configuration	
AT#PRST	Execution command resets the actual audio parameters in the NVM of the device to the default set. It is not allowed if active audio profile is 0. **NOTE :It has no effect and is included only for backward compatibility.** The audio parameters to reset are: - microphone line gain - earpiece line gain - side tone gain - LMS adaptation speed (step size) - LMS filter length (number of coefficients) - speaker to micro signal power relation - noise reduction max attenuation - noise reduction weighting factor (band 300-500Hz) - noise reduction weighting factor (band 500-4000Hz) - AGC Additional attenuation - AGC minimal attenuation - AGC maximal attenuation
AT#PRST=?	Test command returns the OK result code.
Example	AT#PRST OK Current audio profile is reset

3.4.6.1.29 *Audio Profile Configuration save - #PSAV*

#PSAV - Audio Profile Configuration Save	
AT#PSAV	Execution command saves the actual audio parameters in the NVM of the device. It is not allowed if active audio profile is 0. **NOTE :It has no effect and is included only for backward compatibility.** The audio parameters to store are: - microphone line gain - earpiece line gain - side tone gain - LMS adaptation speed - LMS filter length (number of coefficients) - speaker to micro signal power relation - noise reduction max attenuation - noise reduction weighting factor (band 300-500Hz) - noise reduction weighting factor (band 500-4000Hz) - AGC Additional attenuation - AGC minimal attenuation - AGC maximal attenuation
AT#PSAV=?	Test command returns the OK result code.
Example	AT#PSAV OK *Current audio profile is saved in NVM*

3.4.6.1.30 *Audio Profile Selection - #PSEL*

#PSEL - Audio Profile Selection	
AT#PSEL=<prof>	Set command selects the active audio profile. **NOTE :It has no effect and is included only for backward compatibility.** **Parameter:** <prof>: current profile 0 - standard profile 1..3 - extended profile, modifiable. *Note: This parameter is saved in NVM issuing AT&W command.*
AT#PSEL?	The read command returns the active profile in the format:

#PSEL - Audio Profile Selection	
	#PSEL:<prof>
AT#PSEL=?	Test command returns the supported range of values of parameter <prof>.

3.4.6.1.31 *Audio Profile Setting - #PSET*

#PSET - Audio Profile Setting	
AT#PSET= **<scal _in>** **[,<scal _out>** **[,<side_tone_atten>** **[,<adaption_speed>** **[,<filter_length>** **[,<rxtxrelation>** **[,<nr_atten>** **[,<nr_w_0>** **[,<nr_w_1>** **[,<add_atten>** **[,<min_atten>** **[,<max_atten>** **]]]]]]]]]]]]]]]]	Set command sets parameters for the active audio profile. It is not allowed if active audio profile is 0. **NOTE :It has no effect and is included only for backward compatibility.** **Parameters:** **<scal_in>** - microphone line digital gain (unused) **<scal_out>** - earpiece line digital gain (unused) **<side_tone_atten>** - side tone attenuation. **<adaption_speed>** - LMS adaptation speed (unused) **<filter_length>** - LMS filter length (number of coefficients) (unused) **<rxtxrelation>** - speaker to micro signal power relation (unused) **<nr_ atten>** - noise reduction max attenuation (unused) **<nr_w_0>** - noise reduction weighting factor (band 300-500Hz) (unused) **<nr_w_1>** - noise reduction weighting factor (band 500-4000Hz) (unused) **<add_atten>** - AGC Additional attenuation (unused) **<min_atten>** - AGC minimal attenuation (unused) **<max_atten>** - AGC maximal attenuation (unused) It has no effect and is included only for backward compatibility.
AT#PSET?	Read command returns the parameters for the active profile in the format: **#PSET:<scal_in>,<scal_out>,<side_tone_atten>,<adaption_speed>,<filter_length>,<rxtxrelation>,<nr_atten>,<nr_w_0>,<nr_w_1>,<add_atten>,<min_atten>,<max_atten>** It is not allowed if active audio profile is 0.
AT#PSET=?	Test command returns the supported range of values for the audio parameters.

3.4.6.1.32 *Store the ACDB (Audio Calibration Database) file - #ACDB*

#ACDB – Store the ACDB(Audio Calibration Database) file	
AT#ACDB = <size>	Set command to store <**category**> acdb file on FS or to return the current size in Bytes of specific <**category**> file. Parameters: <**mode**> - required action 0 - Store file on FS. 1 - Returns the current <**size**> of the <**category**> file. <**category**> 0 - Audio_cal.acdb 1 - Bluetooth_cal.acdb 2 - General_cal.acdb 3 - Global_cal.acdb 4 - Handset_cal.acdb 5 - Hdmi_cal.acdb 6 - Headset_cal.acdb 7 - Speaker_cal.acdb **<Size> -** Number of bytes to write to the file. In <mode> = 0 After command line terminated with **<CR>**, We see the intermediate result code **CONNECT**. After this prompt, the file type must be in binary format. If data successfully sent, then the response is OK. If data sending fails for some reason, an error code reported. In <mode> = 1 Command returns the current <**size**> of the <**category**> file. **#ACDB:<size>**
AT#ACDB?	Reports the supported range of <**category**> file. **#acdb: (0-1),(0-7),(File Size)**
Example	AT#ACDB=0,2,38 CONNECT ----------→ Send the file with 38 Bytes OK AT#ACDB=1,2 #ACDB: 38 OK

3.4.6.1.33 *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 16 - DTMF tones 32 - SIM Toolkit tones 64 - user defined tones (TBD) 128 - reserved 255 - all classes <mode> - it indicates which volume is used for the classes of tones represented by <class> 0 - default volume is used 1 - The volume <volume> is used. **<volume>** - volume to be applied to the set of classes of tones represented by <class>; it is mandatory if <mode> is 1. 0..*max* - the value of *max* can be read issuing the Test command AT#TSVOL=? **Note:** • The class DTMF Tones (<class>=16) refers only to the volume for locally generated DTMF tones. It doesn't affect the level of the DTMF generated by the network as result of AT+VTS command. • The all classes don't effect on active voice call only AT+CLVL value effected. • Effected on analog mode only.
AT#TSVOL?	Read command returns for each class of tones the last setting of <mode> and, if <mode> is not 0, of <volume> too, in the format: # TSVOL: 1,<mode1>[,<volume1>]<CR><LF> … #TSVOL: 64,<mode64>[,<volume64>] Note: no info is returned for class 128.
AT#TSVOL=?	Test command returns the supported range of values of parameters <class>, <mode> and <volume>.
Example	at#tsvol=84,1,5 OK at#tsvol?

#TSVOL – Tone Classes Volume	
	#TSVOL: 1,0 # TSVOL: 2,0 # TSVOL: 4,1,5 # TSVOL: 8,0 # TSVOL: 16,1,5 # TSVOL: 32,0 #TSVOL: 64,1,5 OK

3.4.6.1.34 *Set Handsfree Sidetone - #SHFSD*

#SHFSD - Set Handsfree Sidetone	
AT#SHFSD= [<mode> [,<gain level>]]	Set command enables/disables the sidetone on Handsfree audio output and change the gain level. Parameter: **<mode>** 0 - Disables the Handsfree sidetone (factory default) 1 - Enables the Handsfree sidetone. **<gain level>** 0..30 - handsfree sidetone gain level (+2dB/step, factory default=15) Note: These parameters saved in NVM issuing AT&W command. **Note: Effected on analog mode only**
AT#SHFSD?	Read command reports whether the handsfree sidetone is currently enabled or not, and current gain level in the format: **#SHFSD: <mode>,<gain level>**
AT#SHFSD=?	Test command returns the supported range of values of parameter **<mode>,<gain level>**.

3.4.6.1.35 *Set Headset Sidetone - #SHSSD*

#SHSSD - Set Headset Sidetone	
AT#SHSSD= [<mode> [,<gain level>]]	Set command enables/disables the sidetone on Headset audio output and change the gain level. **Parameter:** **<mode>**

#SHSSD - Set Headset Sidetone	
	0 - Disables the Headset sidetone (factory default) 1 - Enables the Headset sidetone. **<gain level>** 0..30 - Headset sidetone gain level (+2dB/step, factory default=15) **Note:** These parameters are saved in NVM issuing AT&W command. **Note: Effected on analog mode only**
AT#SHSSD?	Read command reports whether the Headset sidetone is currently enabled or not, and current gain level in the format: **#SHSSD: <mode>,<gain level>**
AT#SHSSD=?	Test command returns the supported range of values of parameter **<mode>,<gain level>**.

3.4.6.1.36 *Handsfree Echo Canceller - #SHFEC*

#SHFEC - Handsfree Echo Canceller	
AT#SHFEC=[<mode>]	It has no effect and is included only for backward compatibility. **Parameter:** **<mode>** (0,1) - (0 is factory default) **Note:** This setting returns to default after power off. **Note :** Added to #ADSPC
AT#SHFEC?	Read command reports the value of parameter **<mode>**, in the format: **#SHFEC: <mode>**
AT#SHFEC=?	Test command returns the supported range of values of parameter **<mode>**.

3.4.6.1.37 *Handset Echo Canceller - #SHSEC*

#SHSEC - Handset Echo Canceller	
AT#SHSEC=<mode>	It has no effect and is included only for backward compatibility. **Parameter:** **<mode>** 0 - disables echo canceller for handset mode (default) 1 - enables echo canceller for handset mode **Note:** This parameter is saved in NVM issuing AT&W command. **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 - Handset Echo Canceller	
	#SHSEC: <mode>
AT#SHSEC=?	Test command returns the supported range of values of parameter **<mode>.**

3.4.6.1.38 *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:** This parameter is saved in NVM issuing AT&W command. **Note :** Added to #ADSPC
AT#SHFNR?	Read command reports the value of parameter **<mode>** , in the format: **#SHFNR: <mode>**
AT#SHFNR=?	Test command returns the supported range of values of parameter **<mode>.**

3.4.6.1.39 *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:** This parameter is saved in NVM issuing AT&W command. **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>.**

3.4.6.1.40 *Extended Error Report for Network Reject Cause – #CEERNET*

#CEERNET - Extended Error Report for Network Reject Cause

AT#CEERNET

Execute command causes the TA to return a numeric code in the format
#CEERNET: <code>
This offers the user of the TA a report for the last mobility management (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
1	SM UNKNOWN CAUSE
2	IMSI UNKNOWN IN HLR
3	ILLEGAL MS
4	IMSI UNKNOWN IN VISITOR LR
5	IMEI NOT ACCEPTED
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
22	CONGESTION
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 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 48 RETRY ON NEW CELL BEGIN(if MM cause failure) /ACTIVATION REJECTED BCM VIOLATION(if SM cause failure) 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 **Note:** if none of this condition has occurred since power up then <code> 0: **"Normal, unspecified"** condition is reported **Note: cause 1 cannot be used in ota.**
AT#CEERNET=?	Test command returns OK result code.
Reference	GSM 24.008

3.4.6.1.41 *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

#PCT - Display PIN Counter	
	0 - the SIM is blocked. 1..3 - if the device is waiting either SIM PIN or SIM PIN2 to be given. 1..10 - if the device is waiting either SIM PUK or SIM PUK2 to be given.
AT#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

3.4.6.1.42 *Software ShutDown - #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:** when issuing the command any previous activity 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.

3.4.6.1.43 *Configure fast power down-#FASTSHDN*

#FASTSHDN – Configure fast power down	
AT#FASTSHDN[=<enable>[,<pin>]]	Set command configure fast power down

#FASTSHDN – Configure fast power down	
	Parameter: **<enable>** - enables/disables fast power down. 0 - disables (factory default) 1 - enables **<pin>** - GPIO number is used for event monitoring. Valid range is "any input pin" (see "Hardware User's Guide"). Default value is 0. If GPIO is set, default setting is Pull-Up, it will be power cut when GPIO get event of Low active. Note: the values are stored in NVM and available on following reboot. Note: When GPIO is used as **#FASTSHDN**, **that is priority is first of the other function. Customer should never be used for other functions.**
AT# FASTSHDN	Execution command immediately fast power down, regardless the GPIO status.
AT# FASTSHDN?	Read command returns the #FASTSHDN current setting, in the format: **#FASTSHDN: <enable>,<pin>**
AT#FASTSHDN =?	Test command reports the range for the parameters **<enable>** and **<pin>**.

3.4.6.1.44 *Rebbots the unit - #REBOOT*

#REBOOT – Rebbots the unit	
AT#REBOOT	Execution command reboots immediately the unit. It can be used to reboot the system after a remote update of the script in order to have the new one running. **Note:** if AT#REBOOT 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#REBOOT, to permit the complete NVM storing. **Note:** AT#REBOOT is an obsolete AT command; please refer to AT#ENHRST to perform a module reboot.
AT#REBOOT=?	Test command returns **OK** result code.
Example	AT#REBOOT OK Module Reboots … AT#REBOOT OK AT#REBOOT=?

#REBOOT – Rebbots the unit	
	OK
Reference	

3.4.6.1.45 ***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.
AT#ENHRST?	Read command reports the current parameter settings for #EHNRST command in the format: #EHNRST: <mod>[,<delay>,<remainTime>] **<remainTime>** - time remaining before next reset
AT#ENHRST=?	Test command reports supported range of values for parameters <mod> and <delay>. AT#ENHRST=? #ENHRST: (0-2),(0-11000) OK
Examples	AT#ENHRST=1,60 …. Module reboots after 60 minutes … AT#ENHRST=1,0 …. Module reboots now … AT#ENHRST=2,60 …. Module reboots after 60 minutes and indefinitely after every following power on …

3.4.6.1.46 *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 configurations 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 - if <dir>=0 – INPUT, remove any Pull-up/Pull-down - output pin cleared to 0 (Low) if <dir>=1 - OUTPUT 1 - if <dir>=0 – INPUT, if <dir>=0 – INPUT, remove any Pull-up/Pull-down - output pin set to 1 (High) if <dir>=1 - OUTPUT 2 - Reports the read value from the input pin if <dir>=0 – INPUT - Reports the read value from the input pin if <dir>=1 - OUTPUT Note: Reports a no meaning value if 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 2,3,4,5,6,7,8,9,10,11,12 - pin direction is Alternate Function ALT1, ALT2, ALT3, ALT4, ALT5, ALT6, ALT7,ALT8 ,ALT9,ALT10,ALT11 respectively this direction. Note: ALT11 → can't be set via #gpio **<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 **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>

#GPIO - General Purpose Input/Output Pin Control	
	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 or Tristate pull down. **Note:** While using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and should be avoided. While pins in used by ALT function it cannot used as GPIO out or by any other ALT function until the original ALT released it or we change it to GPIO in (default state). **Note:** "ALT1" value is valid for LE910CX GPIO1 as “SLED” “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 “FASTSHDN” “ALT7” value is valid for GPIO4 as “WKIO” “ALT8” value is valid for ALL “FRATTRIGGER” “ALT9” value is valid for ALL “HSGC” “ALT10” value is valid for LE910CX GPIO8 as “SWREADYEN” “ALT11” value is valid for ALL GPIOs as “I2C commands **Note:** SLED & SWREADYEN will work depending on HW version
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 ouput format is **#GPIO:<dir>, <stat>, <mode>[<CR><LF>#GPIO:<dir>, <stat>, <mode> […]]**
AT#GPIO=?	Test command reports the supported range of values of the command parameters. **<pin range>,<mode range>,<dir range>,<save>**

#GPIO - General Purpose Input/Output Pin Control	
Examples	at#gpio=? #GPIO: (1-6),(0-4),(0-1),(0,1) OK Note: Most of the LE920A4 & LE910CX support max of 6 GPIO but some support up to 10 please refer to HW user guide at#gpio=3,1,1 // setting gpio_3 as output and value is HIGH OK at#gpio=4,1,1,1 // setting gpio_4 as output and value is HIGH an GPIO pin save configuration OK at#gpio=3,2 // report gpio_3 state #GPIO: 1,1 OK at#gpio? // read command #GPIO: 1,1 // gpio 1 is output and output value is HIGH #GPIO: 0,0 #GPIO: 1,1 #GPIO: 0,0 #GPIO: 0,1 // gpio 5 is input and input value is HIGH #GPIO: 1,0 OK

3.4.6.1.47 *SW READY ENable - #SWREADYEN*

#SWREADYEN – SW *READY ENable*	
AT#SWREADYEN=<en>	Set command enable/disable sw ready led as indicator for that the modem software completed its initializations. **Parameter:** **<en>** - enable/disable sw ready led. **0** – sw ready led will always be in 'off' state **1** – sw ready led will be 'on' after modem sw initialization

AT#SWREADYEN?	Read command reports the current setting of sw ready enable. **#SWREADYEN: <en>** <**en**> - see description above.
AT#SWREADYEN=?	Test command reports the supported range of values for parameter <**en**>.
Note:	- The setting is saved automatically in NVM.

3.4.6.1.48 *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) 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 5 – Stop Sled functionality Note: In LE910 GPIO will be set to default (gpio in). <**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)

#SLED - STAT_LED GPIO Setting	
	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>**.

3.4.6.1.49 *Save STAT_LED GPIO Setting - #SLEDSAV*

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

3.4.6.1.50 *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; audio is forwarded to the analog line; DVI pins should be Not Connected/or Tri-State. (factory default) 1 - enable DVI; audio is forwarded to the DVI block **<dviport>** 2 - DVI port 2 will be used **<clockmode>** 0 - DVI slave(not supported) 1 - DVI master (factory default) **Note:** #DVI parameters saved in the extended profile. LE9x0 supported by “DVI master” only. The <dviport>/<clockmode> parameters have no effect and are included only for backward compatibility. On Active/MT/MO Voice Call return Error. **Note: Effected on digital mode only**

#DVI - Digital Voiceband Interface	
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

3.4.6.1.51 *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 #E2SMSRI enabled a negative, going pulse generated on receipt of an incoming SMS message. Duration of this pulse 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 100 ms break signal is sent and 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

3.4.6.1.52 *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 LE9x0 family 2 - available for LE9x0 family 3 - available for LE9x0 family **<mode>** - required action 2 - query ADC value **<dir>** - direction; its interpretation is currently not implemented 0 - no effect. **Note:** The command returns the last valid measure.
AT#ADC?	Read command reports all pins voltage, converted by ADC, in the format: **#ADC: <value>[<CR><LF>#ADC: <value>[…]]**
AT#ADC=?	Test command reports the supported range of values of the command parameters **<adc>**, **<mode>** and **<dir>**.

3.4.6.1.53 *Auxiliary Voltage Output Control - #VAUX*

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

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

3.4.6.1.54 *Auxiliary Voltage Output save - #VAUXSAV*

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

3.4.6.1.55 *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 units of ten millivolts: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage.
AT#CBC=?	Test command returns the **OK** result code.

3.4.6.1.56 *GPRS Auto-Attach Property - #AUTOATT*

#AUTOATT - Auto-Attach Property	
AT#AUTOATT=[<auto>]	Set command enables/disables the TE GPRS auto-attach property. **Parameter:**

#AUTOATT - Auto-Attach Property	
	<auto> 0 - disables GPRS auto-attach property 1 - enables GPRS auto-attach property (factory default): after the command **#AUTOATT=1** issued (and at every following startup) the terminal will automatically try to attach to the GPRS 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>**.

3.4.6.1.57 *Multislot Class Control - #MSCLASS*

#MSCLASS - Multislot Class Control	
AT#MSCLASS= **[<class>,** **<autoattach>]**	Set command sets the multislot class Parameters: **<class>** - multislot class (1-12, 30-33) - GPRS class (33 factory default) <autoattach> 0 - the new multislot class is enabled only at the next detach/attach or after a reboot. 1 - the new multislot class is enabled immediately, automatically forcing a detach / attach procedure (only in case of GSM network registered).
AT#MSCLASS?	Read command reports the current value of the multislot class in the format: #MSCLASS: <class>
AT#MSCLASS=?	Test command reports the range of available values for both parameters <class> and <autoattach>.

3.4.6.1.58 *V24 Output Pins Configuration - #V24CFG*

V24 Output Pins Configuration - #V24CFG

#V24CFG – V24 Output Pin Configuration	
AT#V24CFG=<pin>,<mode>	Set command sets the AT commands serial port interface output pins mode. Parameters: <pin> - AT commands serial port interface hardware pin: 0 - **DCD** (Data Carrier Detect) 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. 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**" <**mode**> - AT commands serial port interface hardware pins mode: 0 - AT commands serial port mode: output pins controlled by serial port device driver. (default) 1 - GPIO mode: output pins directly controlled by #V24 command only.
AT#V24CFG?	Read command returns actual mode for all the pins (either output and input) in the format: #V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF> #V24CFG: <pin2>,<mode2>[...]] Where: <pinn> - 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>**
Note:	<pin>=1 CTS is disabled, because once configured as gpio, it never works again as CTS, hence we lost hw flow control until rebooting the unit.

V24 Output Pins Control - #V24

#V24 - V24 Output Pins Control	
AT#V24= <pin>[,<state>]	Set command sets the AT commands serial port interface output pins state. **Parameters:** **<pin>** - AT commands serial port interface hardware pin: **0** - DCD (Data Carrier Detect) **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) **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(0,2,3,4) when pin is in GPIO mode (see #V24CFG): **0 - Low** **1 - High**
AT#V24?	Read command returns actual state for all the pins (either output and input) in the format: **#V24: <pin1>,<state1>[<CR><LF>** **#V24: <pin2>,<state2>[...]]** **Where:** **<pinn>** - AT command serial port interface HW pin. **<staten>** - AT commands serial port interface hardware pin state.
AT#V24=?	Test command reports supported range of values for parameters <pin> and <state>
Note:	- if <state> is omitted the command returns the actual state of the pin <pin>. - <pin>=1 CTS is disabled, because once configured as gpio, it never works again as CTS, hence we lost hw flow control until rebooting the unit.

3.4.6.1.59 *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 network>** **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 neighbour of the serving cell. **<WCDMA network>** **0** – it is the active set **1** – it is the candidate set **2** – it is the syncronized neighbour set **3** – it is the unsyncronized neighbour set **4..6** – it is not available **7** - it is a special request to obtain WCDMA-related information from the all sets. **<LTE network>** **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..6** – it is not available **7** - it is a special request to obtain LTE-related information from the all available neighbour cells.
AT#MONI	Read command reports the following GSM/WCDMA-related information for selected cell and dedicated channel (if exists). **<GSM network>** a) When extracting data for the serving cell and the network name is known the format is: **(GSM network)** **#MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> TA:<timadv>** **(WCDMA network)** **#MONI: <netmame> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> DRX:<drx> SCR:<scr> URA:<ura_id>** **(LTE network)** **#MONI: <netmame> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm> DRX:<drx>**

#MONI - Cell Monitor	
	b) When the network name is unknown, the format is: **(GSM network)** **#MONI: Cc:<cc> Nc:<nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> TA:<timadv>** **(WCDMA network)** **#MONI: Cc:<cc> Nc:<nc> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> DRX:<drx> SCR:<scr> URA:<ura_id>** **(LTE network)** **#MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm> DRX:<drx>** c) When extracting data for an adjacent cell, the format is: **(GSM network)** **#MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm> dBm** **(WCDMA network)** **#MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr>** **(LTE network)** **(LTE intra-frequency and inter-frequency cells)** **#MONI: RSRP:<rsrp> RSRQ:<rsrq> PhysCellId:<physicalCellId> EARFCN:<earfcn> PWR:<dBm>** **(LTE WCDMA neighbour cells)** **#MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr>** **(LTE GSM neighbour cells)** **#MONI: Adj Cell<n> BSIC:<bsic> ARFCN:<arfcn> PWR:<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 0..7 **<lac>** - localization area code **<id>** - cell identifier **<physicalCellId>** - physical cell identifier **<pid>** - physical cell identifier **<arfcn>** - assigned radio channel **<dBm>** - received signal strength in dBm **<timadv>** - timing advance **<psc>** - primary ~~synchronisation~~ scrambling code **<rscp>** - Received Signal Code Power in dBm

#MONI - Cell Monitor	
	<ecio> - chip energy per total wideband power in dBm **<uarfcn>** - UMTS assigned radio channel **<drx>** - Discontinuous reception cycle length **<scr>** - Scrambling code **<rsrp> -** Reference Signal Received Power **<rsrq> -** Reference Signal Received Quality **<tac> -** Tracking Area Code **<earfcn> -** E-UTRA Assigned Radio Channel **<ura_id> -** UTRAN Registration Area Identity **Note:** TA: **<timadv>** reported only for the serving cell. When the last setting done is **AT#MONI=7**, then the Read command reports 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 reports the maximum number of cells, in a neighbour of the serving cell excluding it, from which we can extract GSM/WCDMA-related information, along with the ordinal number of the current selected cell, in the format: **#MONI: (<MaxCellNo>,<CellSet>)** **where:** **<MaxCellNo>** - maximum number of cells in a neighbour of the serving cell and excluding it from which we can extract GSM-related informations. This value is always **6**. **<CellSet>** - the last setting done with command **#MONI**.
Note	The refresh time of the measures is preset to 3 sec. The timing advance value is meaningful only during calls or GPRS transfers active. In dedicated mode (when UE is in voice call), cell ID, LAC and PLMN ID of N cells are not known from UE.

3.4.6.1.60 *HSDPA Channel Quality Indication - #CQI*

#CQI - HSDPA Channel Quality Indication	

AT#CQI	Execution command reports channel quality indication in the form: #CQI: <cqi> **Where:** <cqi> - cqi value **3G - UTRAN** 0 - out of range 1 (worst) – 30 (best) 31 - not known or not detectable **4G - LTE** 0 - out of range 1 (worst) – 15 (best) 31 - not known or not detectable
AT#CQI=?	Test command returns the supported range of values of the parameters <cqi>.
Note	Will only work while socket is open and data transfer is active. Working only with UTRAN (see +WS46).

3.4.6.1.61 *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.

#PSNT – Packet Service Network Type	
	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 **<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.
AT#PSNT=?	Test command returns the range of supported **<mode>**s.

3.4.6.1.62 *Read Current Network Status in 3G Network* - #RFSTS

#RFSTS – Read current network Status in 3G network

AT#RFSTS

Read current status in the format

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

Parameter	GSM Example	description
PLMN	"450 05"	Country code and operator code(MCC, MNC
ARFCN	114	GSM Assigned Radio Channel
RSSI	-67	Received Signal Strength Indication
LAC	2011	Localization Area Code
RAC	11	Routing Area Code
TXPWR	1	Tx Power (In traffic only)
MM	19	Mobility Management
RR	0	Radio Resource
NOM	1	Network Operator Mode
CID	2825220	Cell ID
IMSI	"450050203619261"	International Mobile Station ID
NetNameAsc	"SKTelecom"	Operation Name, Quoted string type or “” if name is unknown
SD	3	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 :
ABND	2	Active Band (1 : GSM 850, 2 : GSM 900, 3 : DCS 1800, 4 1900)

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

Parameter	WCDMA Example	description
PLMN	"450 05"	Country code and operator code(MCC, MNC
UARFCN	10737	UMTS Assigned Radio Channel
PSC	75	Active PSC(Primary Synchronization Code)
Ec/Io	-7.0	Active Ec/Io(chip energy per total wideband dBm)
RSCP	-74	Active RSCP (Received Signal Code Power

#RFSTS – Read current network Status in 3G network

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	2B1C04	Cell ID (IN HEX)
IMSI	"450050203619261"	International Mobile Station ID
NetNameAsc	"SKTelecom"	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)
CsAccess	3	Circuit Switch Access (0: Normal calls only, 1: Emergency calls only, 2: No calls, 3: All calls)
PsAccess	3	Packet Switch Access (0: Normal calls only, 1: Emergency calls only, 2: No calls, 3: All calls)
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
ABND	0	Active Band (1 : 2100 MHz, 2 : 1900 MHz, 3 : 850 MHz, 4 : 900 MHz , 5 : 1700 MHz, 6 : 800 MHz, 7 : 1800 MHz)

(LTE network)
#RFSTS:
<PLMN>,<EARFCN>,<RSRP>,<RSSI>,<RSRQ>,<TAC>,[<TXPWR>],<DRX>,<MM>,<RRC>,<CID>,<IMSI>,[<NetNameAsc>],<SD>,<ABND>,<SINR>[CR,LF] [CR,LF]

Parameter	LTE Example	description
PLMN	"262 25"	Country code and operator code(MCC, MNC)
EARFCN	6400	E-UTRA Assigned Radio Channel
RSRP	-99	Reference Signal Received Power
RSSI	-76	Received Signal Strength Indication
RSRQ	-7	Reference Signal Received Quality

#RFSTS – Read current network Status in 3G network

TAC	40A5	Tracking 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
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
SINR	93	Signal-to-Interface plus Noise Ratio (range 0 - 250)

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 are:
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 - CONNECTION_RELEASE_NOT_ALLOWED

#RFSTS – Read current network Status in 3G network	
	Note: RR - Radio Resource States are: 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 38 - RR_INVALID **Note:** RRC (WCDMA) - Radio Resource Control States are: 0 - RRC_STATE_DISCONNECTED 1 - RRC_STATE_CONNECTING 2 - RRC_STATE_CELL_FACH 3 - RRC_STATE_CELL_DCH 4 - RRC_STATE_CELL_PCH 5 - RRC_STATE_URA_PCH 6 - RRC_STATE_WILDCARD 7 - RRC_INVALID

#RFSTS – Read current network Status in 3G network	
	Note: RRC (LTE) - Radio Resource Control States are: 0 - RRC_IDLE 1 - RRC_CONNECTED

3.4.6.1.63 *Temperature Monitor- #TEMPMON*

#TEMPMON - Temperature Monitor	
AT#TEMPMON=<mod>[,<urcmode>[,<action>[,<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. -1 - Operating temperature lower bound. 0 - normal temperature. 1 - Operating temperature upper bound. 2 - Extreme temperature upper bound. (see note 1) **<value> -** actual temperature expressed in Celsius degrees. Setting of the following optional parameters has meaning only if <mod>=0: **<urcmode>** - URC presentation mode. (Default 1) 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 1). 0 - (00) - No action.

	1 - (01) - Activating of thermal mitigation according to thermal configuration file. 2 - (10) - 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. 3- (11) - This value contains <action=1> and <action=2> i.e. activate thermal mitigation and a GPIO indication. If this <action> is required, it is mandatory to set the <GPIO> parameter too. **<GPIO>** - GPIO number. Valid range is any TGPIO pin as described in #GPIO command. This parameter is needed and required only if <action>=2 or 3 are enabled.
AT#TEMPMON ?	Read command reports the current parameter settings for #TEMPMON command in the format: **#TEMPMON: <urcmode>,<action> [,<GPIO>]**
AT#TEMPMON =?	Test command reports the supported range of values for parameters **<mod>, <urcmode>, <action>,** and **<GPIO>**
Notes	1. Thresholds levels are defined in #TEMPCFG command. See there for detailed description on thermal mitigation configuration. 2. Last <action> setting is saved in the 'config.ini' file ('mitigate'/'none mitigate'), and in the NVM ('gpio indication'/'none gpio indication'). 3. Last <GPIO> is saved in the NVM. 4. Thermal mitigation is disabled automatically when using laboratory test SIM.

3.4.6.1.64 *Query Temperature Overflow - #QTEMP*

#QTEMP - Query Temperature Overflow	
AT#QTEMP= [<mode>]	Set command has currently no effect. The interpretation of parameter <mode> currently not implemented. The value assigned to it will simply have no effect. **Valid values:** 0 – returns "OK".
AT#QTEMP?	Read command queries the device internal temperature sensor for over temperature and reports the result in the format: **#QTEMP: <temp>** **where:** **<temp>** - over temperature indicator 0 - The device temperature is in the working range. 1 - The device temperature is out of the working range. See note for working range definition.
AT#QTEMP=?	Test command reports supported range of values for parameter <mode>.
Note	Working range is the normal range as defined in #TEMPCFG command. Working range default value is

#QTEMP - Query Temperature Overflow	
	(-30°C...+80°C). The device should not be operated out of its working temperature range, elsewhere proper functioning of the device is not ensured.

3.4.6.1.65 *Temperature Monitor CONFIGURATION - #TEMPCFG*

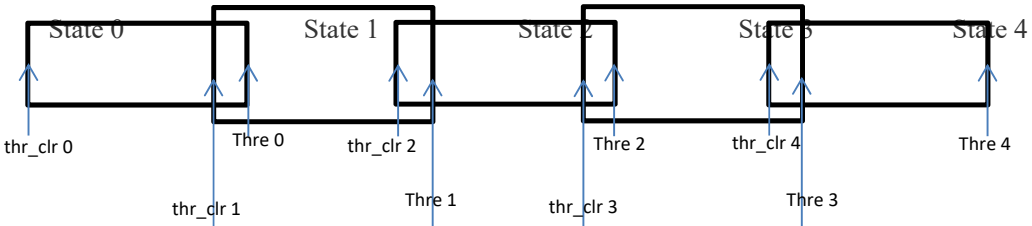
#TEMPCFG – Temperature Monitor Configuration	
AT#TEMPCFG= <etlz_clr>,<etlz>,<etlz_act_in>,<otlz_clr>,<otlz>,<otlz_act_in>,<otnz_clr>,<otnz>,<otnz_act_in>,<otuz_clr>,<otuz>,<otuz_act_in>,<etuz_clr>,<etuz>,<etuz_act_in>	Set command sets the Temperature zones used in the #TEMPMON command. Parameters: <**etlz_clr**>: Extreme low zone temperature threshold clear. Has only one valid value: -273°C. see notes <**etlz**>: Extreme low zone temperature threshold. Default value -33°C. **<etlz_act_in**>: Extreme low zone action info. Default value 0. <**otlz_clr**>: Operate low zone temperature threshold clear. Default value -35°C. **<otlz>**: Operate low zone temperature threshold. Default value -28°C. **<otlz_act_in** >: Operate low zone action info. Default value 0. <**otnz_clr>**: Operate normal zone temperature threshold clear**.** Default value -30°C. **<otnz>**: Operate normal zone temperature threshold**.** Default value 95°C. **<otnz_act_in**>: Operate normal zone action info. Default value 0. <**otuz_clr>**: Operate up zone temperature threshold clear. Default value 93°C. **<otuz>**: Operate up zone temperature threshold. Default value 100°C. **<otuz_act_in**>: Operate up zone action info. Default value 3. <**etuz_clr>**: Extreme up zone temperature threshold clear. Default value 98°C. **<etuz>**: Extreme up zone temperature threshold. Has only one valid value: 528°C. see notes **<etuz_act_in**>: Extreme up zone action info. Default value 3. See notes for detailed description of thermal mitigation

	configuration.
AT#TEMPCFG?	Read command reports the current parameter setting for #TEMPCFG command in the format: #TEMPCFG: **<etlz_clr>,<etlz>,<etlz_act_in>,<otlz_clr>,<otlz>,<otlz_act_in>,<otnz_clr>,<otnz>,<otnz_act_in>,<otuz_clr>,<otuz>,<otuz_act_in>,<etuz_clr>,<etuz>,<etuz_act_in>**
AT#TEMPCFG =?	Test command reports the supported range values for parameters <x_**clr**>,<x>,<x_**action_info**>. Where "x" is substitute for "**etlz**", "**otlz**", "**otnz**", "**otuz**", "**etuz**". Values are: #TEMPCFG: (-40-100),(-40-100),(0-5)

Notes:
After setting new values, it is a must to execute power cycle or #REBOOT command in order to operate the mitigation algorithm with them.
Thermal mitigation mechanism works like this:
The whole temperature scale is divided into 5 states (zones).
Each measured temperature should be belonging to a particular state called the "**current state**".
State is defined by the following fields:
"**thresholds**" – upper temperature boundary of the state. Values are in °C.
"**thresholds_clr**" – lower temperature boundary of the state. Values are in °C.
"**actions**" – indicator that indicates if an action should be taken or not in the "**current state**". Values are: "**none**"/"**mitigate**".
"**action_info**" – thermal mitigation action type that should be taken care if "**actions**" field is "**mitigate**". Values are:
0 - No mitigation action is required.
1 - Mitigation action - data throttling (reducing uplink baud rate).
2 - Mitigation action - TX backoff (reducing MTPL - Max Tx Power Limit).
3 - Emergency Calls Only.
4 - RF OFF. RX and TX circuits automatically disabled (using +CFUN=4).
5- Automatic shutdown. Module is powered off.

User is **prohibited** from setting '**action info**' equal to '**5**'in '**operate normal zone**'. This comes in order to prevent, setting 'Automatic shutdown' by a mistake to the normal operating temperature range.
User is prohibited to set an action of "no mitigation" to "operate up zone" and "extreme up zone", in order to prevent any case where module temperature rise high and still operate at full functionality.
User can not set "normal zone" to a degree bigger than 97deg.
A **"+CME ERROR: operation not supported**" error will be received as a response.

Here is the graph that illustrates the temperature states and their limits.



When temperature exceeds the "**current state**" "**threshold**", the thermal mitigation algorithm searches the next state that this temperature is **lower** than its "**threshold**". After it finds it, the "**current state**" is updated to that "**state**" and then it checks whether "**action**" is "**mitigate**", if yes, then it activates the mitigation according to the "**action info**" of the "**current state**".
When temperature decreases below "**threshold_clr**" then it does the same algorithm as above, but in the opposite direction. It searches the next state that this temperature is **greater** than its " **threshold_clr** ", updates the "**current state**" to that state, and activates mitigation as described above.
There are 2 rules in which states definition should obey:

1. Overlap between 2 adjacent states of at least 2 deg, i.e. ("thre state(x)" – "thre_clr state(x+1)") >= 2
2. Every state shall have "free" temperature range which has no part in any overlap range. This range should be at least 2 deg, i.e. ("thre_clr(x+2)" – "thre(x)") >= 2 .

Rule '1' comes to ensure hysteresis in the transition between two states.
Rule '2' comes to ensure a minimum range for a stable state.
State 0 is '**Extreme low zone**'.
State 1 is '**Operate low zone**'.
State 2 is '**Operate normal zone**'.
State 3 is '**Operate up zone**'.
State 4 is '**Extreme up zone**'.
etlz_clr – Extreme low zone threshold clear is enforced to have value of '-273'. Module doesn't operate in such temperature, but this value is logically set in order to define clearly 'thermal state' to temperatures below -40 deg.
etuz – Extreme up zone threshold is enforced to have value of '528'. Module doesn't operate in such temperature, but this value is logically set in order to define clearly 'thermal state' to temperatures above 100 deg.
"**#TEMPMON**" set command, changes field "actions" to "**mitigate**" or "**none**" to all zones.
All above parameters are saved in a configuration file in the module file system.
Examples:
AT#TEMPCFG= -273,-33,3,-35,-28,2,-30,80,0,78,90,3,88,528,3
OK
Explanation:

zone	Thr_clr	Thr	Action info
'Extreme low zone'	-273	-33	3 – emergency call only
'Operate low zone'	-35	-28	2 – TX backoff
'Operate normal zone'	-30	80	0 – no mitigation
'Operate up zone'	78	90	3 - emergency call only
'Extreme up zone'	88	528	3 - emergency call only

All zones have hysteresis and free temperature range.

AT#TEMPCFG=-273,-33,3,-35,-28,2,-30,**80**,0,**79**,90,3,88,528,3
+CME ERROR: operation not supported
Explanation:

zone	Thr_clr	Thr	Action info
'Extreme low zone'	-273	-33	3 – emergency call only
'Operate low zone'	-35	-28	2 – TX backoff
'Operate normal zone'	-30	**80**	0 – no mitigation
'Operate up zone'	**79**	90	3 - emergency call only
'Extreme up zone'	88	528	3 - emergency call only

('**Thr**' of '**Operate normal zone**') - ('**Thr_clr**' of '**Operate up zone**') = 1 < 2
Rule 1 was broken - Hysteresis is lesser than 2 deg.

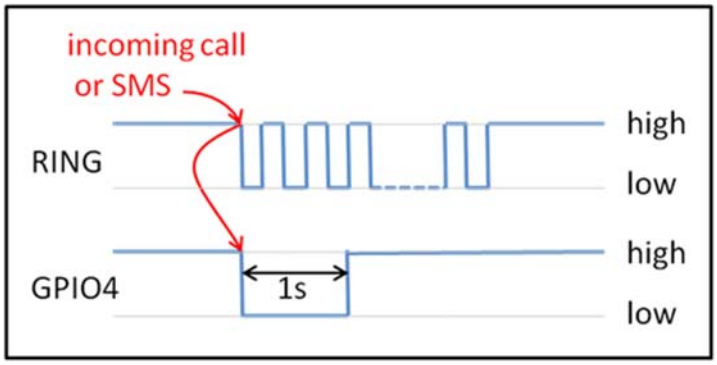
AT#TEMPCFG=-273,-33,3,-35,-28,2,-30,**80**,0,78,90,3,**81**,528,3
+CME ERROR: operation not supported
Explanation:

zone	Thr_clr	Thr	Action info
'Extreme low zone'	-273	-33	3 – emergency call only
'Operate low zone'	-35	-28	2 – TX backoff
'Operate normal zone'	-30	**80**	0 – no mitigation
'Operate up zone'	78	90	3 - emergency call only
'Extreme up zone'	**81**	528	3 - emergency call only

('**Thr_clr**' of '**Extreme up zone**') - ('**Thr**' of '**Operate normal zone**') = 1 < 2
Rule 2 was broken - free temperature range is lesser then 2 deg.

3.4.6.1.66 *Set RING CFG Parameters - #WKIO*

#WKIO – Set RING CFG Parameters	
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, GPIO4 always in HIGH state). 1 – Ring & GPIO 4. 2 – GPIO 4 3 – No Pins (GPIO4 always in HIGH state). <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.
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),(0-2),(0-3),(1-60)**

3.4.6.1.67 *Wake from Alarm Mode - #WAKE*

#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 hardware pin **CTS** to the **ON** status and **DSR** to the **OFF** status, while the "power saving" status is indicated by a **CTS - OFF** ,**DSR - OFF** and USB_VBUS – OFF status. The normal operating status is indicated by **DSR** – **ON or USB_VBUS – ON status**. **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.
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=?	Test command returns the OK result code.

3.4.6.1.68 *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.

#ALARMPIN – Alarm Pin	
	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>.

3.4.6.1.69 *Serving Cell Information - #SERVINFO*

#SERVINFO - Serving Cell Information	
AT#SERVINFO	Execution command reports information about serving cell, in the format: **(GSM network)** **#SERVINFO:<BARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<BSIC>,<LAC>,<TA>,<GPRS>[,[<PB-ARFCN>],[<NOM>],<RAC>,[PAT]]** **(WCDMA network)** **#SERVINFO:<UARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<PSC>,<LAC>,<DRX>,<SD>,<RSCP>,<NOM>,<RAC>,<URA>** **(LTE network)** **#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 or “” if nerwork name is unknown. **<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 informations will be present only if GPRS is supported in the cell

#SERVINFO - Serving Cell Information	
	<PB-ARFCN> - Not supported by 3GPP. 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~~ Scrambling 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 **<EARFCN>** - E-UTRA Assigned Radio Channel **<PhysicalCellId>** - Physical Cell ID **<TAC> -** Tracking Area Code **<RSRP> - Reference** Signal Received Power **<URA>** - UTRAN Registration Area Identity

3.4.6.1.70 *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 strongly 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) To get the proper SIM status, we strongly suggest to set <mode>=2 and save the value in the user profile, then power off and power on the module.
AT#QSS=?	Test command returns the supported range of values for parameter **<mode>**.
Example	AT#QSS? #QSS:0,1 OK

3.4.6.1.71 *Dialling Mode - #DIALMODE*

#DIALMODE - Dialling Mode	
AT#DIALMODE=[<mode>]	Set command sets dialling 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 received. 2 - (voice call and data call) the following custom result codes are received, monitoring step by step the call status:

#DIALMODE - Dialling Mode	
	DIALING (MO in progress) **RINGING** (remote ring) **CONNECTED** (remote call accepted) **RELEASED** (after **ATH**) **DISCONNECTED** (remote hang-up) **Note:** The setting is saved in NVM and available on following reboot.
AT#DIALMODE?	Read command returns current **ATD** dialing mode in the format: **#DIALMODE: <mode>**
AT#DIALMODE =?	Test command returns the range of values for parameter **<mode>**

3.4.6.1.72 *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 – disables (factory default) 1 - enables
AT#NCIH?	Read command reports whether the feature is currently enables or not, in the format: **#NCIH: <enable>**
AT#NCIH=?	Test command returns the supported range of values for the parameter **<enable>**.

3.4.6.1.73 *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 - Automatic Call	
	#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)
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.

3.4.6.1.74 *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. 2 - Enables the automatic call function from "SM" phonebook. 3 - Enables the automatic call function from "ME" phonebook. **<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 internal phonebook chosen, the third for parameter **<index>** when "SM" is the chosen phonebook, the fourth for parameter **<index>** when "ME" 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.

3.4.6.1.75 *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 **<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 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>**

#ECAM - Extended Call Monitoring	
AT#ECAM=?	Test command returns the list of supported values for **<onoff>**

3.4.6.1.76 *Extended Call Monitoring Unsolicited Response mode-#ECAMURC*

#ECAMURC - Extended Call Monitoring Unsolicited Response mode	
AT#ECAMURC=<mode>	Set command Change the mode of #ECAM URC presentation. **Parameter**: <mode> 0 – The presentation of the #ECAM URC between at command and response (default value). 1 – The presentation of the #ECAM URC information after at command response. Note: The setting is saved in NVM and available on following reboot.
AT#ECAMURC?	Read command reports last <mode>, in the format: #ECAMURC:<mode>
AT#ECAMURC=?	Test command reports the supported range of values for parameter <mode>
Example	**Mode = 0** atd0 YYYYYYYYY; #ECAM: 0,1,1,,,"0YYYYYYYYY",129 #ECAM: 0,3,1,,, OK at+chup #ECAM: 0,0,1,,, OK **Mode = 1** atd0 YYYYYYYYY; OK #ECAM: 0,1,1,,,"0YYYYYYYYY",129 #ECAM: 0,3,1,,,

#ECAMURC - Extended Call Monitoring Unsolicited Response mode	
	at+chup OK #ECAM: 0,0,1,,,

3.4.6.1.77 *SMS Overflow - #SMOV*

#SMOV - SMS Overflow	
AT#SMOV=[<mode>]	Set command enables/disables the SMS overflow signalling function. **Parameter:** **<mode>** 0 - disables SMS overflow signaling 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>**
AT#SMOV?	Read command reports whether the SMS overflow signalling function is currently enabled or not, in the format: **#SMOV: <mode>**
AT#SMOV=?	Test command returns the supported range of values of parameter **<mode>**.
Example	AT#SMOV? #SMOV: 0 OK

3.4.6.1.78 *Sms Un- Change Status - #SMSUCS*

#SMSUCS - SMS Un-Change Status	
AT#SMSUCS	Set command allows to keep the SMS Status to UNREAD after +CMGR or +CMGL. **Parameter:** <mode> 0 - The SMS Status will change. (default) 1 - The SMS Status will not change.
AT#SMSUCS?	Read command reports the current value of the parameter <mode>.

#SMSUCS - SMS Un-Change Status	
AT#SMSUCS=?	Test command returns the OK result code.
Example	AT#SMSUCS? #SMSUCS: 1 OK AT+CMGR=1 +CMGR: "REC UNREAD","+393333075581","","08/07/07,10:48:44+36" TEST MESSAGE. OK AT+CMGR=1 +CMGR: "REC UNREAD","+393333075581","","08/07/07,10:48:44+36" TEST MESSAGE. OK

3.4.6.1.79 *Mailbox Numbers - #MBN*

#MBN - Mailbox Numbers	
AT#MBN	Execution command returns the mailbox numbers stored on SIM, if this service 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 (not supported by LTE) "EMAIL" - electronic mail "OTHER" - other **Note:** if all queried locations are empty (but available), no information text lines returned.

#MBN - Mailbox Numbers	
AT#MBN=?	Test command returns the **OK** result code.

3.4.6.1.80 *Message Waiting Indication - #MWI*

#MWI - Message Waiting Indication	
AT#MWI=<enable>	Set command enables/disables the presentation of the **message waiting indicator** URC. **Parameter:** **<enable>** 0 - Disable the presentation of the **#MWI** URC 1 - Enable the presentation of the **#MWI** URC each time a new message waiting indicator is received from the network and, at startup, the presentation of the status of the **message waiting indicators**, as they are currently stored on SIM.. Note: This parameter is saved in NVM issuing AT&W command. 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 (not supported by LTE) 4 - E-mail 5 - Other **<count>** - message counter - network information reporting the number of pending messages related to the message waiting indicator **<indicator>**. The presentation at startup of the **message waiting indicators** status, as they are currently stored on SIM, is as follows: **#MWI: <status>[,<indicator>[,<count>]|<CR><LF>** **#MWI: <status>,<indicator>[,<count>][...]]]** **where:** **<status>**

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

3.4.6.1.81 *Repeat Last Command - #/*

#/ - Repeat Last Command	
AT#/	Execute command is used to execute again the last received command.

3.4.6.1.82 *Network Timezone - #NITZ*

#NITZ - Network Timezone	
AT#NITZ= **[<val>** **[,<mode>]]**	Set command enables/disables (a) automatic date/time updating, (b) Full Network Name applying and (c) **#NITZ** URC; moreover it permits to change the **#NITZ** URC format. Date and time information can be sent by the network after GSM registration or after GPRS attach. **Parameters:** **<val>** 0 - disables (a) automatic data/time updating, (b) Full Network Name applying and (c) **#NITZ** URC; moreover it sets the **#NITZ** URC *'basic'* format (see **<datetime>** below)(factory default) 1..15 - as a sum of: 1 - enables automatic date/time updating 2 - enables Full Network Name applying (not supported by LE) 4 - it sets the **#NITZ** URC *'extended'* format (see **<datetime>** below)

#NITZ - Network Timezone	
	8 - it sets the **#NITZ** URC *'extended'* format with Daylight Saving Time(DST) support (see **<datetime>** below) **<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>**.

3.4.6.1.83 *Clock Management - #CCLK*

#CCLK - Clock Management	
AT#CCLK= <time>	Set command sets the real-time clock of the **ME**. **Parameter:** **<time>** - current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz,d" **yy** - year (two last digits are mandatory), range is (00..99) **MM** - month (two last digits are mandatory), range is (01..12)

#CCLK - Clock Management	
	dd - day (two last digits are mandatory), available ranges are (01..28) (01..29) (01..30) (01..31) **hh** - hour (two last digits are mandatory), range is (00..23). **mm** - minute (two last digits are mandatory), range is (00..59). **ss** - seconds (two last digits are mandatory), range is (00..59). **±zz** - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory), range is –96..+96. **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>**.
AT#CCLK=?	Test command returns the **OK** result code.
Example	AT#CCLK="14/02/18,08:00:00+12,1" OK AT#CCLK? #CCLK: "14/02/18,08:00:02+12,1" OK **NOTE:** The way of writing the **<time>**: "yy/mm/dd,hh:mm:ss±zz,d" - AT#CCLK="02/09/07,22:30:00+00,1"
Reference	3GPP TS 27.007

3.4.6.1.84 *Clock Mode - #CCLKMODE*

#CCLKMODE – Clock Mode	
AT#CCLKMODE=<mode>	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 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: 14/01/19,16:38:41+08 at+cclk? +CCLK: "14/01/19,16:38:50+08" OK at#cclkmode=1 OK at+cclk? +CCLK: "14/01/19,14:39:01+08" OK

3.4.6.1.85 *set time Clock Source - #CLKSRC*

#CLKSRC – set time Clock Source	
AT#CLKSRC= <src>	Set command selects the source time clock for the system between NITZ, GNSS or a combination between. **Parameter:** **<src>** - sets the clock source. **0** – NITZ time only **1** – GNSS time only **2** – GNSS time priority **3** – NITZ time priority **4** – DISABLE. With this value, clock source shall not be update not by NITZ nor by GNSS. The only possibility to set it is by manual setting.
AT#CLKSRC?	Read command reports the current clock source configuration. **#CLKSRC: <src> ,<curr>** <**src**> - see description above.

	<**curr**> - the current source of time as displayed by +cclk command. Values are: **0** – INVALID. Time wasn't yet updated through NITZ, GNSS or Manual. **1** – NITZ source. **2** – GNSS source. **3** – Manual source.
AT#CLKSRC=?	Test command reports the supported range of values for parameter <**src**>.
Note:	- The setting is saved automatically in NVM. - Setting time manually is possible to all values of <**src**>, but in values of '**0**', '**1**', '**2**' and '**3**' time shall be override when NITZ or GNSS arrives according to the rule that is defined to that value.

3.4.6.1.86 *Alarm Management - +CALA*

+CALA - Alarm Management	
AT+CALA=<time>[,<n>[,<type>[,<text>[,<recurr>[,<silent>]]]]]	Set command stores in the internal Real Time Clock an alarm time with respective settings. It is possible to set up a recurrent alarm for one or more days in the week. • Currently just one alarm can be set. • DO NOTE! Alarms are not supported after disconnecting from power. Coin cell are supported. In case of a power cut, alarm will be deleted and needs to be re-set. When the RTC time reaches the alarm time then the alarm starts, the behavior of the MODULE depends upon the setting <type> and if the device was already ON at the moment when the alarm time had come. **Parameters:** **<time>** - current alarm time as quoted string in the same format as defined for +CCLK command (i.e. "yy/MM/dd,hh:mm:ss±zz"), unless the **<recurr>** parameter is used: in this case <time> must not contain a date (i.e."hh:mm:ss±zz") **<n>** - index of the alarm 0 - The only value supported is 0. **<type>** - alarm behaviour type

	0 - reserved for other equipment use. **1 -** the MODULE simply wakes up fully operative as if the ON/OFF button had been pressed. If the device is already ON at the alarm time, then it does nothing.(Default) **2 -** The MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE issues an unsolicited code every 3s: **+CALA: <text>** Where <text> is the +CALA optional parameter previously set. The device keeps on sending the unsolicited code every 3s until a #WAKE or #SHDN command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90s then it shuts down. (default) **3 -** 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. If alarm expires during a call alarm sound will stop when the call is disconnected. **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 alarmpin high, provided that one has been set (using #ALARMPIN or #GPIO), and keeps it in this state until a #WAKE or #SHDN command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90s then it shuts down. 5 - The MODULE will make both the actions as for type=2 and <type>=3. 6 - The MODULE will make both the actions as for type=2 and <type>=4. 7 - The MODULE will make both the actions as for type=3 and <type>=4. **8 -** The MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE sets High the RI output pin. The RI output pin remains High until next #WAKE issue or until a 90s timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90s. After that it shuts down. **<text>** - unsolicited alarm code text string. It has meaning only if <type> is equal to 2 or 5 or 6. **<recurr>** - string type value indicating day of week for the alarm in one of the following formats: "<1..7>[,<1..7>[, …]]" - it sets a recurrent alarm for one or more days in the week; the

	digits 1 to 7 corresponds to the days in the week (Monday is 1). "0" - it sets a recurrent alarm for all days in the week. **<silent>** - integer type indicating if the alarm is silent or not. **0 - the alarm will not be silent;** **1 -** the alarm will be silent. **Note:** a special form of the Set command, +CALA="", deletes an alarm in the ME Note: The "alarm mode" is indicated by hardware pin CTS to the ON status and DSR to the OFF status, while the "power saving" status is indicated by a CTS - OFF ,DSR - OFF and USB_VBUS – OFF status. The normal operating status is indicated by DSR – ON or USB_VBUS – ON status. During the "alarm mode" the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SMS. The only commands that can be issued to the MODULE in this state are the #WAKE and #SHDN, every other command must not be issued during this state.
AT+CALA?	Read command returns the list of current active alarm settings in the ME, in the format: **[+CALA: <time>,<n>,<type>,[<text>],<recurr>,<silent>]** **Note: on READ command <time> does not include the time zone.**
AT+CALA=?	Test command returns the list of supported index values (currently just 0), alarm types, maximum length of the text to be displayed, maximum length of <recurr> and supported <silent>s, in the format: **+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>,<rlength>,(list of supported <silent>s)**
Example	AT+CALA="02/09/07,23:30:00+00" OK
Reference	3gpp TS 27.007

3.4.6.1.87 *Delete Alarm - +CALD*

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

3.4.6.1.88 *Generic SIM access - +CSIM*

+CSIM - action command syntax	
AT+CSIM= <length>, <command>	**Possible response(s)** +CSIM: <length>,<response> +CME ERROR: <err> Set command transmits to the MT the <command> it then shall send as it is to the SIM. In the same manner the SIM **<response>** shall be sent back by the MT to the TA as it is. Refer subclause 9.2 for **<err>** values. This command allows a direct control of the SIM by an distant application on the TE. The TE shall then take care of processing SIM information within the frame specified by GSM/UMTS. **Note:** Compared to Restricted SIM Access command +CRSM, the definition of +CSIM allow TE to take more control over the SIM-MT interface. The locking and unlocking of the interface may be by a special <command> value or automatically by TA/MT (by interpreting <command> parameter). In case that TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, MT may release the locking. **Defined values** **<length> :** integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response) **<command> :** command passed on by the MT to the SIM in the format as described in GSM 51.011 [28] (hexadecimal character format; refer +CSCS) **<response> :** response to the command passed on by the SIM to the MT in the format as described in GSM 51.011 [28] (hexadecimal character format; refer +CSCS)
AT+CSIM=?	Test command returns the **OK** result code

3.4.6.1.89 *Alert Sound - +CALM*

+CALM - Alert Sound Mode

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

3.4.6.1.90 *Select Band - #BND*

#BND - Select Band	
AT#BND=<GSM_band>[,<WCDMA_band>[,<LTE_band_mask>[,<TDSCDMA_band_mask>]]]	Set command selects the current band. **Parameter:** **< GSM_band >**: 0 - GSM 900 MHz + DCS 1800 MHz 1 - GSM 900 MHz + PCS 1900 MHz 2 - GMS 850 MHz + DCS 1800 MHz 3 - GSM 850 MHz + PCS 1900 MHz 4 - GSM 900 MHz + DCS 1800 MHz + PCS 1900 MHz 5 - GSM 900 MHz + DCS 1800 MHz + PCS 1900 MHz + GSM 850 MHz **< WCDMA_band >**: 0 – B1 (2100 MHz) 1 – B2 (1900 MHz) 2 - B5 (850 MHz) 3 – B1 (2100 MHz) + B2 (1900 MHz) + B5 (850 MHz) 4 - B2 (1900 MHz) + B5 (850 MHz) 5 – B8 (900 MHz) 6 – B1 (2100 MHz) + B8 (900 MHz) 7 – B4 (1700 MHz) 8 – B1 (2100 MHz) + B5 (850 MHz) 9 – B1 (2100 MHz) + B8 (900 MHz) + B5 (850 MHz)

	10 – B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) 11 – B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B8 (900 MHz) 12 – B6 (800 MHz) 13 – B3 (1800 MHz) 14 - B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz) 15 – B1 (2100 MHz) + B8 (900 MHz) + B3 (1800 MHz) 16 – B8 (900 MHz) + B5 (850 MHz) 17 - B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz) 18 - B1 (2100 MHz) + B5 (850 MHz) + B6 (800 MHz) + B8 (900 MHz) 19 - B2 (1900 MHz) + B6 (800 MHz) 20 - B5 (850 MHz) + B6 (800 MHz) 21 - B2 (1900 MHz) + B5 (850 MHz) + B6 (800 MHz) 22 - B1 (2100 MHz) + B3 (1800 MHz) + B5 (850 MHz) + B8 (900 MHz) 23 - B1 (2100 MHz) + B3 (1800 MHz) **< LTE_band_mask >** 0x00000 No bands allowed 0x00001 EUTRAN BAND1 0x00002 EUTRAN BAND2 0x00004 EUTRAN BAND3 0x00008 EUTRAN BAND4 0x00010 EUTRAN BAND5 0x00040 EUTRAN BAND7 0x00080 EUTRAN BAND8 0x00800 EUTRAN BAND12 0x01000 EUTRAN BAND13 0x10000 EUTRAN BAND17 0x80000 EUTRAN BAND20 0x1000000 EUTRAN BAND25 0x2000000 EUTRAN BAND26 0x8000000 EUTRAN BAND28 0x00200000000 EUTRAN BAND34 0x02000000000 EUTRAN BAND38 0x04000000000 EUTRAN BAND39 0x08000000000 EUTRAN BAND40 0x10000000000 EUTRAN BAND41 **< TDSCDMA_band_mask >** 0x00000 No bands allowed 0x00001 TDS BAND34 A 0x00020 TDS BAND39 F 0x00010 TDS BAND40 E

	Note: 127 – GSM/WCDMA invalid value **Note:** FFFFFFFFFFFFFFFF – LTE/TDSCDMA invalid value for all models **Note:** in set command LTE/TDSCDMA band mask should be entered in HEX format without "0x". In Read and test commands it also appears without "0x". Example: AT#BND=5,15,800C5 OK
AT#BND?	Read command returns the current selected band in the format: **#BND: < GSM_band >[, < WCDMA_band >[,< LTE_band_mask >[,< TDSCDMA_band_mask >]]]**
AT#BND=?	Test command returns the supported range of values of parameters **< GSM_band >, < WCDMA_band >,< LTE_band_mask >,< TDSCDMA_band_mask >, if the technology supported by model.** LTE and TDSCDMA bands shown as maximal bit mask for model in HEX. Example: AT#BND=? #BND: (0-5),(0,5,6,13,15),(800C5) OK →800C5 LTE bit mask means all combinations of next bands could be accepted by SET command: 0x00000 No bands allowed 0x00001 EUTRAN BAND1 0x00004 EUTRAN BAND3 0x00040 EUTRAN BAND7 0x00080 EUTRAN BAND8 0x80000 EUTRAN BAND20

3.4.6.1.91 *Automatic Band Selection - #AUTOBND*

#AUTOBND - Automatic Band Selection	
AT#AUTOBND=[<value>]	Remains for backward compatibility purpose only Set command returns the **OK** result code. **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.

#AUTOBND - Automatic Band Selection	
AT#AUTOBND?	Read command returns the **OK** result code.
AT#AUTOBND=?	Test command returns the range of supported values for parameter **<value>**.

3.4.6.1.92 *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 - does not skip the escape sequence; its transmission is enabled (factory default). 1 - skips the escape sequence; its transmission not enabled. **Note:** in case of an FTP connection, the escape sequence not transmitted, regardless of the command setting.
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>**.

3.4.6.1.93 *Subscriber number - #SNUM*

#SNUM – Subscriber Number	SELINT 2
AT#SNUM=<index>,<number>[,<alpha>]	Set command writes the MSISDN information related to the subscriber (own number) on 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>** 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 can be writen 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 not allocated and activated in the SIM Service Table (see 3GPP TS 11.11).

#SNUM – Subscriber Number	SELINT 2
AT#SNUM=?	Test command returns the OK result code

3.4.6.1.94 *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 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.

3.4.6.1.95 *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 during PPP-GPRS connections. **Parameter:** **<type>** 0 - no authentication 1 - PAP authentication (factory default) 2 - CHAP authentication 3 – AUTO authentication (PAP or CHAP or no authentication according to host application, factory default) **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

#GAUTH - PPP-GPRS Connection Authentication Type	
	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>**.

3.4.6.1.96 *GSM Antenna Detection - #GSMAD*

#GSMAD - GSM Antenna Detection	
AT#GSMAD= <mod>, [<urcmode> [,<interval> [,<detGPIO> [,<repGPIO> [,<antenna > [<adc>]]]]]]	Set command sets the behavior of antenna detection algorithm **Parameters:** **<mod>** 0 - detection algorithm not active 1 - detection algorithm active; detection is started every <**interval**> period, using <detGPIO> for detection. 2 - triggers the new measurement of the antenna presence, reporting the result in the format: **#GSMAD: <antenna>,<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). <**antenna**> 1 - Main (default) 2 - DIV 3 - GPS 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: <antenna>,<presence>** **where:** <**presence**> and < **antenna** > are as before **<interval>** - duration in seconds of the interval between two consecutive antenna detection algorithm runs (default is 120). It has meaning only if <**mod**> is 1. 1..3600 - seconds **<detGPIO>** - defines which GPIO shall be used as input by the Antenna Detection algorithm. (default is 1) Valid range is "any input pin number" (see "Hardware User Guide"). **<repGPIO>** - defines which GPIO shall be used by the Antenna Detection algorithm to report antenna condition. Value 0 means that no report is made using GPIO (default 0). It has meaning only if <**mod**> is 1. 0 - no report is made using GPIO Valid range is "any output pin number" (see "Hardware User Guide"). **<antenna>** - index of requested antenna. 1 - Main (default) 2 - DIV 3 - GPS **<adc>** - index of requested ADC. 1 - ADC1 (default) 2 - ADC2 3 - ADC3 **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>,<antenna>,<adc >.
AT#GSMAD?	Read command returns the current parameter settings for #GSMAD command in the format: **#GSMAD:** <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>,<antenna>,<adc><CR><LF> **#GSMAD:** <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>,<antenna>,<adc ><CR><LF>

	#GSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>,<antenna>,<adc><CR><LF>

3.4.6.1.97 *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)
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>

3.4.6.1.98 *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>**.

3.4.6.1.99 *Write to I2C - #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, with the LSB, used for read\write command. It doesn’t matter if the LSB is set to 0 or to 1. 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. **Note:** At the end of the execution GPIO will be restored to the original setting (check AT#GPIO Command) Device address, register address where to read from\ write to, and date bytes have to be written in hexadecimal form without 0x.
AT#I2CWR=?	Test command returns the range of each parameter.
Example	AT#I2CWR=2,3,30,10,14 > 00112233445566778899AABBCCDD<ctrl-z> OK Set GPIO2 as SDA, GPIO3 as SCL;

#I2CWR – Write to I2C	
	Device I2C address is 0x30; 0x10 is the address of the first register where to write I2C data; 14 data bytes will be written since register 0x10.

3.4.6.1.100 *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

3.4.6.1.101 *Power Saving Mode Ring Indicator - #PSMRI*

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

AT#PSMRI=?	Reports the range of supported values for parameter **<n>**
Note	When RING signal for incoming call/SMS/socket listen is enabled, the behavior for #PSMRI will be ignored.

3.4.6.1.102 *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.

3.4.6.1.103 *Enhanced Network Selection - #ENS*

#ENS - Enhanced Network Selection	
AT#ENS=[<mode>]	Set command is used to activate the ENS functionality. **Parameter:** **<mode>** 0 - Disable ENS functionality (default). 1 - Enable ENS functionality; If AT#ENS=1 has been issued, the following values will be automatically set and also at every next power-up: – All bands are enabled – SIM Application Toolkit enabled on user interface 0 if not previously enabled on a Different user interface (AT#STIA=2). - PLMN list not fixed (AT#PLMNMODE=1).
AT#ENS?	Read command reports whether the ENS functionality is currently enabled or not, in the format: #ENS: <mode> **where:** <mode> as above.
AT#ENS=?	Test command reports the available range of values for parameter <mode>.

3.4.6.1.104 *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>** - RX Diversity 0 - disable the RX Diversity 1 - enable WCDMA RX Diversity constantly (default value) 6 - Test mode. The main antenna port is used for the Tx chain; second antenna port is used as the only Rx chain. **<DARP_mode>** - DARP mode 0 – DARP not supported 1 – DARP phase 1(default value) **Notes:** - The values set by command are directly stored in NVM, and they are available at next power on. - If <DIV_enable> is set to 0, then <DARP_mode> is automatically set to 1 regardless the set value.
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>.

3.4.6.1.105 *Swap RX from main to diversity #RXTOGGLE*

#RXTOGGLE – Swap RX from main to diversity	
AT#RXTOGGLE = <Toggle_enable>	Set command moves the RX receiver from main antenna to the diversity antenna **Parameters:** **< Toggle_enable >** 0 – Set the RX to the main antenna. 1 - Set the RX to the Diversity antenna **Note:** **Currently support swap only at LTE** **This command used for lab purpose.**
AT#RXTOGGLE?	Read command reports the currently selected < **Toggle_enable** > in the format: #RXTOGGLE: < **Toggle_ enable** >

AT#RXTOGGLE =?	Test command reports the supported range of values

3.4.6.1.106 *Ciphering indication - # CIPHIND*

#CIPHIND – Ciphering Indication	**SELINT 2**
AT#CIPHIND =[<mode>]	Set command enables/disables unsolicited result code for cipher indication. The ciphering indicator feature allows to detect that ciphering is not switched on and to indicate this to the user. The ciphering indicator feature may be disabled by the home network operator setting data in the SIM/USIM. If this feature is not disabled by the SIM/USIM, then 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 **<mode>**,**<cipher>** and **<SIM/USIM flag>**: **#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)

#CIPHIND – Ciphering Indication	SELINT 2
AT#CIPHIND =?	Test command reports the range for the parameter **<mode>**

3.4.6.1.107 *Set Encryption Algorithm - #ENCALG*

#ENCALG - Set Encryption Algorithm	
AT#ENCALG= **[<encGSM>]** **[,<encGPRS>]**	This command enables or disables the "GSM / WCDMA CS" and/or "GPRS / WCDMA PS" encryption algorithms supported by the module. **Parameters:** **<encGSM>:** 0 – no "GSM / WCDMA CS" encryption algorithm 1..7 - sum of integers each representing a specific "GSM / WCDMA CS" encryption algorithm: 1 – A5/1 2 – A5/2 4 – A5/3 255 - reset the default values **<encGPRS>:** 0 – no "GPRS / WCDMA PS" encryption algorithm 1..7 - sum of integers each representing a specific "GPRS / WCDMA PS" encryption algorithm: 1 – GEA1 2 – GEA2 4 – GEA3 255 - reset the default values Note: the values are stored in NVM and available on following reboot. Note: For possible <encGSM> encryptions see test command response

AT#ENCALG?	Read command reports the currently selected <encGSM> and <encGPRS>, and the last used <useGSM> and <useGPRS> in the format: **#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>** **Parameters:** **<usedGSM>:** 0 – no "GSM / WCDMA CS" encryption algorithm 1 – A5/1 2 – A5/2 4 – A5/3

	255 - unknown information **<usedGPRS>:** 0 – no "GPRS / WCDMA PS" encryption algorithm 1 – GEA1 2 – GEA2 4 – GEA3 255 - unknown information
AT#ENCALG=?	Test command reports the supported range of values for parameters in the format: <encGSM> and <encGPRS>.
Example	AT#ENCALG? #ENCALG: 5,2,1,1 OK AT#ENCALG=5,1 OK Sets the "GSM / WCDMA CS" encryption algorithm A5/1 and A5/3, and the "GPRS / WCDMA PS" encryption algorithm GEA1. It will be available at the next reboot. AT#ENCALG? #ENCALG: 5,2,1,1 OK The last two values indicate that the last used "GSM / WCDMA CS" encryption algorithm is A5/1 and the last used "GPRS / WCDMA PS" encryption algorithm is GEA1. After reboot AT#ENCALG? #ENCALG: 5,1,1,1

3.4.6.1.108 *Configure FRAT Trigger parameter - #FRATTRIGGER*

#FRATTRIGGER – configure FRAT Trigger parameter	
AT#FRATTRIGGER=<gpio_pin>[,<trigger_value>]	This command sets the parameter needed to trigger the FRAT: **Parameters:** **<gpio_pin>** - Numeric parameter that selects how to get the frat_trigger value. 0 – gets the frat_trigger value from **<trigger_value>**. (1-6) – gets the frat_trigger value from TGPIO #<gpio_pin>. **<trigger_value>** - numeric parameter which selected how to trigger the FRAT. 0 – slow trigger 1 – fast trigger

#FRATTRIGGER – configure FRAT Trigger parameter	
	NOTE: <gpio_pin> is attached to ALT8 func (see AT#GPIO). <gpio_pin> is save to NVM. <gpio_pin> default is 0. <trigger_value> default is 1. <trigger_value> will reset to default in each power up.
AT#FRATTRIGGER?	Read command returns the current settings for the frat trigger: #FRATTRIGGER: <gpio_pin>,<trigger_value>
AT#FRATTRIGGER=?	Test command returns the supported range of parameters <gpio_pin>,<trigger_value>
NOTES	

3.4.6.1.109 *Delete audio file - #ADELF*

#ADELF – Delete audio file	SELINT 2
AT#ADELF=<filename>	This command deletes a specific audio file. Parameter: <**filename**> - file name, string type Note: filename has a maximum of 32 characters.
AT#ADELF=?	Test command returns the OK result code

3.4.6.1.110 *Delete all audio files - #ADELA*

#ADELA – Delete all audio files	SELINT 2
AT#ADELA	This command deletes all audio files stored on the Linux File system.
AT#ADELA=?	Test command returns the OK result code

3.4.6.1.111 *List audio file - #ALIST*

#ALIST – List audio file	SELINT 2
AT#ALIST	This command lists all audio files stored in linux file system. The response format is: #ALIST: <filename>,<filesize>**<CR><LF>** <filename>,<filesize>**<CR><LF>** <filename>,<filesize>**<CR><LF>** Parameter: **<filename>** - file name, string type <**filesize**> - file size in bytes
AT#ALIST=?	Test command returns the OK result code

3.4.6.1.112 *Audio available size - #ASIZE*

#ASIZE – Audio available size	SELINT 2
AT#ASIZE	This command shows residual space in bytes available to store audio files. The response format is: #ASIZE: <total size>,<used size>,<free size>
AT#ASIZE=?	Test command returns the OK result code

3.4.6.1.113 *Send an audio file - #ASEND*

#ASEND – Send an audio file	SELINT 2
AT#ASEND= <filename>,<filesize>	This command allows user to send an audio file to serial port and store it in the modem Parameters: <filename> - file name, string type <filesize> - file size in bytes

	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> CONNECT Note: after the CONNECT, an audio file has to be sent to serial port

3.4.6.1.114 *Select Ringer Sound Extended - #SRSEXT*

#SRSEXT - Select Ringer Sound Extended	
AT#SRSEXT= <mode>[, <file_name>]	Set command sets the specific ring sound from file system. **Parameters:** **<mode>** 0- mode off (factory default) 1- mode on. **<file_name>** - string type, file name. Current ringing file name. **<file_name>** has a maximum of 32 characters. **Notes:** • When the command is issued with <**mode** > 1 , the ringing tone is stored as default ringing tone (AT#SRS is ignored). • If command is issued with < **mode** > 0, default ring tone will set according to AT#SRS. • **< file_name >** parameter is mandatory if the <mode> = 1 is issued, but it has to be omitted for <mode> = 0 is issued. • **<file_name>** must be exists in APLAY folder (AT#ALIST). • The setting is saved in NVM and available on following reboot.
AT#SRSEXT?	Read command reports current selected ringing and its status in the form: #SRSEXT: <**mode** >,< **file_name** >

#SRSEXT - Select Ringer Sound Extended	
	where: **< mode >** - ringing tone mode **< file_name >** - file name.
AT#SRSEXT=?	Test command reports the supported values for the parameters < **mode** > and < **file_name** >
Example	

3.4.6.2 Multisocket AT Commands

3.4.6.2.1 *Socket Status - #SS*

#SS - Socket Status	
AT#SS	Execution command reports the current status of the sockets in the format: **#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>** **[<CR><LF><connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>** **[…]]** **where:** **<connId>** - socket connection identifier 1..6 **<state>** - actual state of the socket: 0 - Socket Closed. 1 - Socket with an active data transfer connection. 2 - Socket suspended. 3 - Socket suspended with pending data. 4 - Socket listening. 5 - Socket with an incoming connection. Waiting for the user accept or shutdown command. 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.

#SS - Socket Status	
	<remPort> - it is the port we are connected to on the remote machine.
AT#SS=?	Test command returns the **OK** result code.

3.4.6.2.2 *Socket Info - #SI*

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

#SI - Socket Info	
	AT#SI=1 #SI: 1,123,400,10,50 OK We have information only about socket number 1

3.4.6.2.3 *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**: **<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>,< type 6>,< direction 6>
AT#ST=?	Test command reports the range for parameter <connId>.
Example	single socket:

	AT#ST=3 #ST: 3,2,1 Socket 3 is an UDP dialer.

3.4.6.2.4 *Context Activation - #SGACT*

#SGACT - Context Activation	
AT#SGACT= <cid>,<stat> [,<userId>, <pwd>]	Execution command is used to activate the specified PDP context, followed by binding data application to the PS network. Also, it is used to deactivate the PDP context and unbind data application from PS network **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:** 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. **Note:** If the unsolicited result code for obtaining IP address was enabled (urcmode value) using #SGACTCFG command, on start up and due to USB enumeration timing the unsolicited may not appear , user should manually use +CGPADDR command to see the IP address.
AT#SGACT?	Returns the state of all the five contexts, in the format:

#SGACT - Context Activation	
	#SGACT: <cid1>,<Stat1><CR><LF> **…** **#SGACT: <cid5>,<Stat5>** **where:** **<cid*n*>** - as **<cid>** before **<stat*n*>** - context status 0 - context deactivated 1 - context activated
AT#SGACT=?	Reports the range for the parameters **<cid>** and **<stat>**

3.4.6.2.5 *Socket Shutdown - #SH*

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

3.4.6.2.6 *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 **<pktSz>** - packet size to be used by the TCP/UDP/IP stack for data sending. Used for online data mode only. 0 - automatically chosen by the device. 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

#SCFG - Socket Configuration	
	0 - no timeout n(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. 0 - no timeout n(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. Used for online data mode only. 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 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:** these values are automatically saved in NVM.
AT#SCFG?	Read command returns the current socket configuration parameters values for all the six sockets, in the format: **#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1>** **<CR><LF>** **. . .** **#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>** **<CR><LF>**
AT#SCFG=?	Test command returns the range of supported values for all the subparameters.
Example	at#scfg? #SCFG: 1,1,300,90,600,50 #SCFG: 2,2,300,90,600,50 #SCFG: 3,2,250,90,600,50 #SCFG: 4,1,300,90,600,50 #SCFG: 5,1,300,90,600,50 #SCFG: 6,1,300,90,600,50 OK

3.4.6.2.7 *Context activation configuration extended - #SGACTCFGEXT*

#SGACTCFGEXT - context activation 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 (see +CGDCONT command) 1..5 - numeric parameter which specifies a particular PDP context definition **<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 GPRS context activation attempt through #SGACT command in the following manner. While waiting for AT#SGACT=<cid>,1 response(up to 150 s) 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. Otherwise, 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:** the command is not effective while the context is already open.
AT#SGACTCFGEXT?	Read command reports the state of all the five contexts, in the format: **#SGACTCFGEXT:** <cid1>,< abortAttemptEnable1 >,0,0,0<CR><LF> … **#SGACTCFGEXT:** <cid5>,< abortAttemptEnable5 >,0,0,0<CR><LF> **where:** **<cid*n*>** - as <cid> before <abortAttemptEnable *n*> - as <abortAttemptEnable> before. **Note:** values are automatically saved in NVM
AT#SGACTCFGEXT=?	Test command reports supported range of values for all parameters

3.4.6.2.8 *PAD forward character - #PADFWD*

PAD forward character - #PADFWD	
AT#PADFWD= <char>[,<mode>]	This command sets the char that immediately flushes pending data to socket, opened with AT#SD command. **Parameters:** **<char>** a number, from 0 to 255, that specifies the asci code of the char used to flush data **<mode>** flush mode, 0 – normal mode (default) 1 – reserved **Note:** use AT#PADCMD to enable the socket char-flush activity.
AT#PADFWD?	Read command reports the currently selected <char> and <mode> in the format: #PADFWD: <char>,mode
AT#PADFWD=?	Test command reports the supported range of values for parameters <char> and <mode>.

- **Feature PAD currently applicable for UART only**

3.4.6.2.9 *PAD command features - #PADCMD*

PAD command features - #PADCMD	
AT#PADCMD= <mode>	This command sets features of the pending data flush to socket, opened with AT#SD command. **Parameters:** **<mode>:** Bit 1: 1 - enable forwarding; 0 – disable forwarding; Other bits reserved. **Note:** forwarding depends on character defined by AT#PADFWD
AT#PADCMD?	Read command reports the currently selected <mode> in the format: #PADCMD: mode
AT#PADCMD=?	Test command reports the supported range of values for parameter <mode>.

- **Feature PAD currently applicable for UART only**

3.4.6.2.10 *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>** **where:** **<connId>** - as before **<recData>** - amount of data received on the socket connection 2 - data view mode: **SRING : <connId>,<recData>,<data>** **where:** **<connId>** - **<recData>** - as before **<data>** - received data; the presentation format depens on the subparameter **<dataMode>** value **<dataMode>** - "data view mode" presentation format 0 - data represented as text (default) 1 - data represented as sequence of hexadecimal numbers (from 00 to FF) 3 – Data view with UDP datagram informations: **SRING : <remoteIP>,<remotePort><connId>,<recData>,** **<dataLeft>,<data>** same as before with <remoteIP>,<remotePort> and <dataLeft> that means the number of bytes left in the UDP datagram **<keepalive> - TCP keepalive** timer timeout -The interval between two keepalive transmissions in idle condition. 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)

#SCFGEXT - Socket Configuration Extended	
	Each octet of the data is given as two IRA character long hexadecimal number **Note**: **KeepAlive Interval -** Interval between two successive keepalive retransmissions, if acknowledgement to the previous keepalive transmission is not received. Non configurable value: 75 sec. **KeepAlive Probes** - The number of unacknowledged retransmissions to send out before closing socket. Non configurable value: 9 retransmissions. **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**>,<**sendDataMode1**>,**<CR><LF>** **...** **#SCFGEXT: <connId6>,<srMode6>,<dataMode6>,<keepalive6>** <**ListenAutoRsp6**>,<**sendDataMode6**>,
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, a keepalive time of 30 minutes and listen auto-response set. Socket 3 set with data amount sring, hex recv data mode, no keepalive and listen auto-response not set. Socket 4 set with hex recv and send data mode at#scfgext? #SCFGEXT: 1,2,0,30,1,0 #SCFGEXT: 2,0,0,0,0,0 #SCFGEXT: 3,1,1,0,0,0 #SCFGEXT: 4,0,1,0,0,1 #SCFGEXT: 5,0,0,0,0,0 #SCFGEXT: 6,0,0,0,0,0 OK

3.4.6.2.11 *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 done when new data 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) 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 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 given to the AT interface, the ERROR message will be received on the interface itself. **Note**: values 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> added. For possible <cause> values, see also #SLASTCLOSURE **Note**: like #SLASTCLOSURE, in case of subsequent consecutive closure causes received, the original disconnection cause 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

#SCFGEXT2 - Socket Configuration Extended	
	mode 2), it is indicated cause 1 for both possible FIN and RST from remote. parameters values for all the six sockets, in the format: #SCFGEXT2:<**connId1**>,<**bufferStart1**>,<**abortConnAttempt**>,0,0,0 <CR><LF> ... #SCFGEXT2:<**connId1**>,<**bufferStart1**>,<**abortConnAttempt**>,0,0,0
AT?	
AT#SCFGEXT2=?	Test command returns the range of supported values for all the subparameters
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.

3.4.6.2.12 *Socket Configuration Extended 3 - #SCFGEXT3*

#SCFGEXT3 - Socket Configuration Extended 3	
AT#SCFGEXT3=<connId>,<immRsp>[,<closureTypeCmdModeEnabling>[,<	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

#SCFGEXT3 - Socket Configuration Extended 3	
fastsring>,<lingerTime>[,<unused_D>]]]]]	**<immRsp>** - Enables AT#SD command mode immediate response 0 – factory default, means that AT#SD in command mode (see AT#SD) returns 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**> - It has no effect and is included only for backward compatibility 0 – factory default <**fastsring**> - It has no effect and is included only for backward compatibility 0 – factory default <**lingerTime**> - Defines the time (in seconds) that the connection will not return until all queued messages for the socket have been successfully sent or the linger timeout has been reached. 0 – factory default / minimum 120 – maximum seconds (equals to 2 minutes) **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>,<closureTypeCmdModeEnabling1>,<fastsring1>,<lingerTime1>,0<CR><LF> . . . #SCFGEXT3: <connId6>,<immRsp6>,<closureTypeCmdModeEnabling6>,<fastsring6>,<lingerTime6>,0<CR><LF>
AT#SCFGEXT3=?	Test command returns the range of supported values for all the parameters.

3.4.6.2.13 *Socket Dial - #SD*

#SD - Socket Dial	
AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>[,<closureType>[,<lPort>[,<connMode>[,<txTime>[,<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 host name to be solved with a DNS query

#SD - Socket Dial	
	- 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 **<closureType>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default)255 - local host closes after an escape sequence (+++) **<lPort>** - UDP connections local port 1..65535 **<connMode>** - Connection mode 0 - online mode connection (default) 1 - command mode connection **<txTime>** - Adjusting a time interval for series of UDP data packets will be uploaded. 0 – Time interval is not requested (default) 1..1000 – Time interval in milliseconds. **<userIpType> -** ip type for socket to open 0 – no ip type chosen;[default] 1 – ipv4. 2 – ipv6. **Note: <userSockType>** this parameter only valid when <ipaddr> is domain name and dual stack connection is open by (AT#sgact). **Note: when <userSockType> 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

#SD - Socket Dial	
	#SRECV. Under the same hypotheses it's possible to send data while in **command mode** issuing **#SSEND**. **Note:** <txTime> parameter is valid for UDP connections only and has no effect (if used) for TCP connections. For slow servers it is recommended to adjust the time interval for uploading series of data packets in order to do not lose data. The following data packet will be sent after the previous data packet's time interval has been expired.
AT#SD=?	Test command reports the range of values for all the parameters.
Example	Open socket 1 in online mode AT#SD=1,0,80,"www.google.com",0,0,0 CONNECT … Open socket 1 in command mode AT#SD=1,0,80,"www.google.com",0,0,1 OK

3.4.6.2.14 *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>.

#BASE64 – Base64 encoding/decoding of socket sent/received data	
	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) **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 sub parameters.
Example	AT#SKIPESC=1 OK AT#SD=<connId>,<txProt>,<rPort>,<IPaddr> CONNECT //Data sent without modifications(default) …… +++ (suspension) OK

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

	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
	……
	+++ (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)
	……

3.4.6.2.15 *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.

3.4.6.2.16 *Socket Restore - #SO*

#SO - Socket Restore	
AT#SO=<connId>	Execution command resumes socket connection which has been suspended by the escape sequence. **Parameter:**

#SO - Socket Restore	
	<connId> - socket connection identifier 1..6
AT#SO=?	Test command reports the range of values for **<connId>** parameter.

3.4.6.2.17 *Socket Listen - #SL*

#SL - Socket Listen	
AT#SL=<connId>, <listenState>, <listenPort> [,<lingerT>]	This command opens/closes a socket listening for an incoming connection on a specified port. **Parameters:** **<connId>** - socket connection identifier 1..6 **<listenState>** - 0 - closes socket listening 1 - starts socket listening **<listenPort>** - local listening port 0..65535 **<lingerT>** - linger time 0 - immediate closure after remote closure 255 - local host closes only after an escape sequence (+++) **Note:** if successful, commands returns a final result code **OK**. 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: **#SKTL: ABORTED**
AT#SL?	Read command returns all the actual listening TCP sockets.
AT#SL=?	Test command returns the range of supported values for all the subparameters.
Example	Next command opens a socket listening for TCP on port 3500 without.

#SL - Socket Listen	
	AT#SL=1,1,3500 OK

3.4.6.2.18 *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 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) disconnect. Cause 3 and 4 are still possible. (Cause 1 is obviously never possible)

#SLASTCLOSURE – Detect the cause of a socket disconnection	
	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>

3.4.6.2.19 *Socket Listen UDP - #SLUDP*

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

#SLUDP - Socket Listen UDP	
AT#SLUDP=?	Test command returns the range of supported values for all the subparameters.
Example	Next command opens a socket listening for UDP on port 3500. AT#SLUDP=1,1,3500 OK

3.4.6.2.20 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 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: <remoteIP>,<remotePort><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>,1,15,45

#SRECV – Received Data in Command Mode	
	stringa di test OK SRING URC (<srMode> be 1, <dataMode> be 1) telling 15 bytes data have just come through connected socket identified by <connId>=2 and are now buffered SRING: 2,15 Read in hexadecimal format the buffered data AT#SRECV=2,15 #SRECV: 2,15 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

3.4.6.2.21 *Send UDP data to a specific remote host - #SSENDUDP*

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

#SSENDUDP – send UDP data to a specific remote host	
	string type: “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.
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 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

#SSENDUDP – send UDP data to a specific remote host	
	OK

3.4.6.2.22 *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 in dotted decimal notation, string type: "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>**

3.4.6.2.23 *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; **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)

#SSEND – Send Data in Command Mode	
AT#SSEND=?	Test command returns OK message.
Example	Send data through socket number 2 AT#SSEND=2 >Test<CTRL-Z> OK

3.4.6.2.24 *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 specifying total number of bytes as second **Parameter:**
	at#ssendext=1,256
	> ..... ; // Terminal echo of bytes sent is displayed here
	OK
	All possible bytes (from 0x00 to 0xFF) are sent on the socket as generic bytes.

3.4.6.2.25 *IP Easy Authentication Type - #SGACTAUTH*

#SGACTAUTH – Easy GRPS Authentication Type	
AT#SGACTAUTH=	Set command sets the authentication type for IP Easy

#SGACTAUTH – Easy GRPS Authentication Type	
<type>	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 NWM
AT#SGACTAUTH?	Read command reports the current IP Easy authentication type, in the format: **#SGACTAUTH: <type>**
AT#SGACTAUTH=?	Test command returns the range of supported values for parameter <type>.

3.4.6.2.26 *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 GPRS Attach or after a NW PDP CONTEXT deactivation if at least one IPEasy socket is configured to this context (sees AT#SCFG). **Parameters:** **<cid>** - PDP context identifier (see +CGDCONT command) 1..5 - numeric parameter which specifies a particular PDP context definition **<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 are 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 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 five 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 reports supported range of values for parameters <cid>>,<retry>,<delay>and < urcmode >

3.4.6.3 SSL Commands

3.4.6.3.1 *Enable a SSL socket - #SSLEN*

#SSLEN – Enable 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 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 current value of the <status> parameter, in the format: #SSLEN: <SSId>,<Enable><CR><LF> <CR><LF> OK
AT#SSLEN=?	Test command returns the range of supported values for all the parameters: #SSLEN: (1),(0,1)
Example	AT#SSLEN=1,1 OK

3.4.6.3.2 *Opens a socket SSL to a remote server - #SSLD*

#SSLD – Opens 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. **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 – Until now only closure type 0 supported. SSL session id and keys are free. **<connMode> -** connection mode 0 – online mode connection. 1 – command mode connection (factory default). **<Timeout> -** time-out in 100 ms units. It represents the maximum allowed TCP inter-packet delay. It means that, when more data is expected during the handshake, the module awaits <Timeout> * 100 msecs for the next packet. If no more data can be read, the module gives up the handshake and raises an ERROR response. **Note:** if we set **<connMode>** to **online mode connection** and the command is successful we enter into **online data mode** and we see the intermediate result code **CONNECT**. After the **CONNECT** we can suspend the direct interface to the socket connection (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 is possible to resume it by using the **#SSLO** 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**: **<Timeout>** is the total handshake timeout or, in other words, it is not the absolute maximum time between the #SSLD issue and the CONNECT/OK/ERROR response. Though by changing this parameter you can limit the handshake duration (for example in case of congested network or busy server), there's no way to be sure to get the command response within a certain amount of time, because it depends on the TCP connection time, the handshake time and the computation time (which depends on the authentication mode and on the size of keys and certificates).10..5000 - hundreds of ms (factory default is 100) **Note**: If secure socket is not enabled, 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 #SSLCFG, with a default value of 90 seconds), and the '**NO CARRIER**' message is printed.

#SSLD – Opens a socket SSL to a remote server	
	Note: in online mode data is 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 (Certificate, CA certificate, private key), using **AT#SSLSECDATA**, for the security level set through **AT#SSLSECCFG**. **Note**: Before opening a SSL connection the GPRS context must have been activated by **AT#SGACT=x,1** **Note**: The PDP context definition that will be used, is set by **AT#SSLCFG** command
AT#SSLD=?	Test command returns the range of supported values for all the parameters: **#SSLD: (1),(1-65535),,(0),(0,1),(10-5000)**
Example	Start command mode: **AT#SSLD=1,8500,"84.94.194.21",0,1** **OK** Start online mode: **AT#SSLD =1,8500,"84.94.194.21",0,0** **OK** **CONNECT** Configure correct PDP context with AT#SSLCFG command: **at#sgact=3,1** **#SGACT: XX.XXX.XXX.XXX** **OK** ** Note the second parameter of sslcfg ** **at#sslcfg=1,3,300,90,100,50,0,0,0,0** **OK** **at#ssld=1,<port>,"IP or URL",0,0** **CONNECT**

3.4.6.3.3 *Send data through a SSL socket - #SSLSEND*

#SSLSEND – Send data through a SSL socket	
AT#SSLSEND= <SSId>[,< Timeout >]	This command allows sending data through 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. 10..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 1023. **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**
AT#SSLSEND=?	Test command returns the range of supported values for all the parameters: **#SSLSEND: (1),(10-5000)**

3.4.6.3.4 *Read data from a SSL socket - #SSLRECV*

#SSLRECV – Read 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 10..5000 - hundreds of ms (factory default is 100) If no data are received the device responds: #SSLRECV: 0<CR><LF> TIMEOUT<CR><LF> <CR><LF> OK If the remote host closes the connection the device responds: #SSLRECV: 0<CR><LF> DISCONNECTED<CR><LF> <CR><LF> OK If data are received the device responds: #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),(10-5000)**

3.4.6.3.5 *Report the status of a SSL socket - #SSLS*

#SSLS - Report 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 in following format: **#SSLS: <SSId>,<ConnectionStatus>,<CipherSuite>** **Note:** ConnectionStatus will equal 2 otherwise: **#SSLS: <SSId>,<ConnectionStatus>** **Note**: ConnectionStatus value will be equal 0 or 1. **ConnectionStatus** posible values are: 0 – Socket Disabled 1 – Connection closed 2 – Connection open **CipherSuite** posible values are: 0 - Chiper Suite is chosen by remote Server [default] 1 - TLS_RSA_WITH_RC4_128_MD5 2 - TLS_RSA_WITH_RC4_128_SHA 3 - TLS_RSA_WITH_AES_256_CBC_SHA 4 - TLS_RSA_WITH_NULL_SHA **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)
Example	**AT#SSLS=1** **#SSLS: 1,1** **OK** **AT#SSLS=1** **#SSLS: 1,2,0** **OK**

3.4.6.3.6 *Close a SSL socket - #SSLH*

#SSLH – Close a SSL socket	
AT#SSLH=<SSId>[,<ClosureType>]	This command allows closing the SSL connection. **Parameters:** **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. **< ClosureType >:** how to close SSL socket 0 – Until now, only closure type 0 supported. SSL session id and keys are free. **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)**

3.4.6.3.7 *Restore a SSL socket after a +++ - #SSLO*

#SSLO - Restore 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**: Before opening a SSL connection the GPRS context must have been activated by **AT#SGACT=X, 1**. **Note**: if an error occur during reconnection the socket cannot 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)**

3.4.6.3.8 *Configure general parameters of a SSL socket - #SSLCFG*

#SSLCFG – Configure general parameters of a SSL socket	
AT#SSLCFG=<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>[,<skipHostMismatch>[,<UNUSED_2>[,<UNUSED_3>[,<UNUSED_4>]]]]	This command allows configuring SSL connection parameters. **Parameters:** **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manages only one socket **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition **<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 1..255 - timeout value in hundreds of milliseconds (default 50). **<skipHostMismatch>** - ignores Host Mismatch alert. 0 - Do not ignore 1 – Ignore (default).. **Note:** If secure socket is not enabled (using **#SSLEN)** only test requests can be made. **Note:** these values automatically saved in NVM.
AT#SSLCFG?	Read command reports the currently selected parameters in the format: **#SSLCFG:** **<SSId1>,<cid>,<pktSz>,<maxTo>,<defTo><txTo>,<skipHostMismatch>,0,0,0**
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),(0-1),(0),(0),(0)**

3.4.6.3.9 *Configure security parameters of a SSL socket – #SSLSECCFG*

#SSLSECCFG – Configure security parameters of a SSL socket	
AT#SSLSECCFG=<SSId>,<CipherSuite>,<SecLevel>	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 2 - TLS_RSA_WITH_RC4_128_SHA 3 - TLS_RSA_WITH_AES_256_CBC_SHA 4 - TLS_RSA_WITH_NULL_SHA **<SecLevel>** 0 - No authentication [default] 1 - Manage server authentication 2 - Manage server and client authentication if requested by the remote server **Note**: if no authentication is set no security data are needed (Client certificate, Server CAcertificate and Client private key). **Note**: if only server authentication is managed then Server CAcertificate has to be stored through **AT#SSLSECDATA**. **Note**: if server and client authentication are managed then client certificate and private key, and server CAcertificate have to be stored through **AT#SSLSECDATA**. Please note that private keys with password are not Supported. **Note**: only “rsa_sign” certificates are supported by the Telit Module in client authentication. The remote server must support this certificate type, otherwise the handshake will fail. **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: <SSId1>,<CipherSuite>,<SecLevel>**
AT#SSLSECCFG=?	Test command returns the range of supported values for all the parameters. **#SSLSECCFG: (1),(0-2),(0-2)**

3.4.6.3.10 *Manage the security data - #SSLSECDATA*

#SSLSECDATA - Manage 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. **Parameters:** **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manages only one socket.

#SSLSECDATA - Manage 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..2047 If the **<Action> parameter** is 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 deleted) the response has the following format: **#SSLSECDATA: <connId>,<DataType>** **No data stored** **OK** **Note**: Secured data has to be in PEM format. **Note**: private keys with password ARE NOT supported. **Note**: only "rsa_sign" certificates are supported by the Telit Module in client authentication. The remote server must support this certificate type, otherwise the handshake will fail. **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.
AT#SSLSECDATA?	Read command reports what security data are stored in the format: **#SSLSECDATA:<SSId1>,<CertIsSet>,<CAcertIsSet>,<PrivKeyIsSet>** **<CertIsSet>, <CAcertIsSet>, <PrivKeIsset>** 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),(1-2047)**

3.4.6.4 FTP AT Commands

3.4.6.4.1 *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

3.4.6.4.2 *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 GPRS must been activated with AT#GPRS=1 or AT# SGACT
AT#FTPOPEN=?	Test command returns the OK result code.

3.4.6.4.3 *FTP Close - # FTPCLOSE*

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

3.4.6.4.4 *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. **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 IP address the client doesn't consider this and connects with server using the IP address used in AT#FTPOPEN. **<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>

3.4.6.4.5 *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>

3.4.6.4.6 *FTP Get - #FTPGET*

#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 received on the serial port. **Parameter:**

	<filename> - file name, string type. **Note:** The command causes an ERROR result code to be returned if no FTP connection has been opened yet.
AT#FTPGET=?	Test command returns the OK result code.

3.4.6.4.7 *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.

3.4.6.4.8 *FTP Type - #FTPTYPE*

#FTPTYPE - FTP Type	
AT#FTPTYPE= [<type>]	Set command, issued during an FTP connection, sets the file transfer type.

	Parameter: **<type>** - file transfer type: 0 - binary 1 - ascii **Note:** The command causes an ERROR result code to be returned if no FTP connection has been opened yet.
#FTPTYPE?	Read command returns the current file transfer type, in the format: #FTPTYPE: <type>
#FTPTYPE=?	Test command returns the range of available values for

3.4.6.4.9 *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.

3.4.6.4.10 *FTP Print Working Directory - #FTPPWD*

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

3.4.6.4.11 *FTP Change Working Directory - #FTPCWD*

#FTPCWD - FTP Change Working Directory	
AT#FTPCWD=[<dirname>]	Execution command, issued during an FTP connection, changes the working Directory on FTP server.

	Parameter: <dirname> - string type, it's the name of the new working directory. **Note:** The command causes an ERROR result code to be returned if no FTP Connection has been opened yet.
AT#FTPCWD=?	Test command returns the OK result code.

3.4.6.4.12 *FTP List - #FTPLIST*

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

3.4.6.4.13 *Get file size from FTP - #FTPFSIZE*

#FTPFSIZE – Get file size from FTP	
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.

3.4.6.4.14 *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) **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>

3.4.6.4.15 *Set restart position for FTP GET - #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.

3.4.6.4.16 *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 FTPGETPTK gives an 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 reports the supported range of values for parameter < blocksize >
Example	AT#FTPRECV? #FTPRECV: 3000 OK *Read required part of the buffered data:* AT#FTPRECV=400 #FTPRECV:400

	Text row number 1 * 11111111111111111111111111 * Text row number 2 * 22222222222222222222222222 * Text row number 3 * 33333333333333333333333333 * Text row number 4 * 44444444444444444444444444 * Text row number 5 * 55555555555555555555555555 * Text row number 6 * 66666666666666666666666666 * Text row number 7 * 77777777777777777777777777 * Text row number 8 * 88888888888888888888 OK AT#FTPRECV=200 #FTPRECV:200 88888 * Text row number 9 * 99999999999999999999999999 * Text row number 10 * AAAAAAAAAAAAAAAAAAAAAAAAAA* Text row number 11 * BBBBBBBBBBBBBBBBBBBBBBBBBB * Text row number 12 * CCCCCCCCCCCCCCCC 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)*

3.4.6.4.17 *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> 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)*

3.4.6.4.18 *FTP Read Message - #FTPMSG*

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

3.4.6.5 AT Commands

3.4.6.5.1 *Authentication User ID - #USERID*

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

3.4.6.5.2 *Authentication Password - #PASSW*

#PASSW - Authentication Password	
AT#PASSW=	Set command sets the user password string used during the authentication step.

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

3.4.6.5.3 *Packet Size - #PKTSZ*

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

3.4.6.5.4 *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. Used for online data mode only. **Parameter:** **<tout>** - packet sending time-out in 100ms units (factory default is 50) 0 - no time-out, wait forever for packets completed before send. 1..255 hundreds of ms **Note:** In order to avoid low performance issues, 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 might be delay for an undefined time until new data to be sent had been received and full packet size reached.
AT#DSTO?	Read command reports the current data sending time-out value.
AT#DSTO=?	Test command returns the allowed values for the parameter **<tout>**.
Example	AT#DSTO=10 *->1 sec. time-out* OK AT#DSTO? #DSTO: 10 OK

3.4.6.5.5 *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 GPRS context. **Parameter:** **<tout>** - socket inactivity time-out in seconds units 0 - no time-out. 1..65535 - time-out in sec. units (factory default is 90). **Note:** this time-out applies when no data exchanged in the socket for a long time and therefore the socket connection automatically closed and the GPRS 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 - Socket Inactivity Time-Out	
	#SKTTO: 30 OK

3.4.6.5.6 *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 0..65535 - port number (factory default is 0) **<remote addr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: xxx.xxx.xxx.xxx - any 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 0..65535 - port number **<userIpType> -** ip type for socket to open 0 – no ip type chosen;[default] 1 – ipv4. 2 – ipv6. **Note: <closure type>** parameter is valid only for TCP socket type. For UDP sockets will be unused. **Note: <local port>** parameter is valid only for UDP socket type. For TCP sockets will be unused. **Note:** The resolution of the host name is over when opening the socket. Therefore, if an invalid host name given to the **#SKTSET** command an error message issued. **Note:** the DNS Query to be successful requests that: - the GPRS context 1 is correctly set with **+CGDCONT** - the authentication parameters are set **(#USERID**, **#PASSW**)

#SKTSET - Socket Definition	
	- the GPRS coverage is enough to permit a connection.
AT#SKTSET?	Read command reports the socket parameters values, in the format: **AT#SKTSET: <socket type>,<remote port>,<remote addr>, <closure type>,<local port>,<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.

3.4.6.5.7 *Socket Open - #SKTOP*

#SKTOP - Socket Open	
AT#SKTOP	Execution command activates the context number 1, proceeds with the authentication with the user ID and password previously set by #USERID and #PASSW commands, and opens a socket connection with the host specified in the #SKTSET command. Eventually, before opening the socket connection, it issues automatically a DNS query to solve the IP address of the host name. If the connection succeeds a **CONNECT** indication is sent, otherwise a **NO CARRIER** indication is sent.
AT#SKTOP=?	Test command returns the **OK** result code.
Example	AT#SKTOP *..GPRS context activation, authentication and socket open..* CONNECT
Note	This command is obsolete. It's suggested to use the couple #SGACT and #SO instead of it.

3.4.6.5.8 *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. If the DNS query is successful then the IP address will be reported in the result code: **#QDNS:"<host name>",<IP address>** **<userIpType>** - in dual stack case the user can choose the ip type to get IP address. According to this parameter DNS request will be sent.

#QDNS - Query DNS	
	1 – ipv4. 2 – ipv6. **Note:** the command has to activate the GPRS context if it not previously activated. In this case, the context 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 <userSockType> is "no ip type chosen**" ipv6 will be requested firstly. When ipv6 DNS server doesn't support so ipv4 will be requested.
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 GPRS network is present.

3.4.6.5.9 *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** had 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"**

3.4.6.5.10 *Manual DNS Selection - #DNS*

#DNS – Manual DNS Selection	
AT#DNS=<cid>, <primary>, <secondary>	Set command allows to manually set primary and secondary DNS servers for a PDP context defined by **+CGDCONT.** **Parameters:** **<cid>** - context identifier 1..5 - numeric parameter which specifies a particular PDP context definition **<primary>** **Ipv4- manual primary DNS server**, string type, in the format **"xxx.xxx.xxx.xxx"** used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0") **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 primary DNS server**, string type, in the format **"xxx.xxx.xxx.xxx"** used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0") **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"** **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"** were 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 were 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.

#DNS – Manual DNS Selection	
AT#DNS?	Read command returns the manual DNS servers set either for every defined PDP context and for the single GSM context (only if defined), in the format: **[#DNS: <cid>,<primary>,<secondary>[<CR><LF>** **#DNS: <cid>,<primary>,<secondary>]]** **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),,**

3.4.6.5.11 *Socket TCP Connection Time-Out - #SKTCT*

#SKTCT - Socket TCP Connection Time-Out	
AT#SKTCT=[<tout>]	Set command sets the TCP connection time-out for the first **CONNECT** answer from the TCP peer to be received. **Parameter:** **<tout>** - TCP first **CONNECT** answer time-out in 100ms units 10..1200 - hundreds of ms (factory default value is 600). **Note:** this time-out applies only to the time that the TCP stack waits for the **CONNECT** answer to its connection request. **Note:** The time for activate the GPRS and resolving the name with the DNS query (if the peer was specified by name and not by address) is not counted in this time-out.
AT#SKTCT?	Read command reports the current TCP connection time-out.
AT#SKTCT=?	Test command returns the allowed values for parameter **<tout>**.
Example	AT#SKTCT=600 OK *socket first connection answer time-out has been set to 60 s.*

3.4.6.5.12 *Socket Parameters save - #SKTSAV*

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

3.4.6.5.13 *Socket Parameters Reset - #SKTRST*

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

3.4.6.5.14 *GPRS Context Activation - #GPRS*

#GPRS - GPRS Context Activation	
AT#GPRS= **[<mode>]**	Execution command deactivates/activates the GPRS context, eventually proceeding with the authentication with the parameters given with #PASSW and #USERID. **Parameter:** **<mode>** - GPRS context activation mode 0 - GPRS context deactivation request 1 - GPRS context activation request In the case that the GPRS context has been activated, the result code **OK** is preceded by the intermediate result code: 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 : This command is valid only for *Context* 1
AT#GPRS?	Read command reports the current status of the GPRS context, in the format: **#GPRS: <status>** **where:** **<status>** 0 - GPRS context deactivated 1 - GPRS context activated
AT#GPRS=?	Test command returns the allowed values for parameter **<mode>**.
Example	AT#GPRS=1 +IP: 129.137.1.1 OK *Now GPRS Context has been activated and our IP is 129.137.1.1* AT#GPRS=0 OK *Now GPRS context deactivated, IP is lost.*

3.4.6.5.15 *PPP Configuration - #PPPCFG*

#PPPCFG - PPP Configuration	
AT#PPPCFG= **<mode>**	Set command for PPP

#PPPCFG - PPP Configuration	
	Parameters: **<mode>** 0- Set the ppp mode to be passive mode 1- Set the ppp mode to be active mode(Default) Note: The setting are save at NVM
AT#PPPCFG?	Read command returns the current MODE, in the format: **#PPPCFG: <mode>**
AT#PPPCFG =?	Test command returns the range of available values for parameters **<mode>**

3.4.6.5.16 *Socket Dial - #SKTD*

#SKTD - Socket Dial	
AT#SKTD= **[<socket type>,** **<remote port>,** **<remote addr>,** **[<closure type>],** **[<local port>]]**	Set command opens the socket towards the peer specified in the parameters. **Parameters:** **<socket type>** - socket protocol type 0 - TCP (factory default) 1 - UDP **<remote port>** - remote host port to be opened 0..65535 - port number (factory default is 0) **<remote addr>** - address of the remote host, string type. This parameter can be either: -any valid IP address in the format: xxx.xxx.xxx.xxx - any 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 0..65535 - port number **<userIpType> -** ip type for socket to open 0 – no ip type chosen;[default] 1 – ipv4. 2 – ipv6.

#SKTD - Socket Dial	
	Note: <closure type> parameter is valid only for TCP socket type, for UDP sockets left unused. **Note: <local port>** parameter is valid only for UDP socket type, for TCP sockets left unused. **Note:** the resolution of the host name is done when opening the socket, therefore if an invalid host name is given to the **#SKTD** command, then an error message will be issued. **Note:** the command to be successful requests that: - the GPRS context 1 is correctly set with +CGDCONT - the authentication parameters are set (#USERID, #PASSW) the GPRS coverage is enough to permit a connection - the GPRS has been activated with **AT#GPRS=1** **Note:** If all parameters 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
Note	The main difference between this command and #SKTOP is that this command does not interact with the GPRS context status, leaving it **ON** or **OFF** according to the #GPRS setting, therefore when the connection made with **#SKTD** is closed the context (and hence the local IP address) is maintained.

3.4.6.5.17 *Socket Listen Ring - #E2SLRI*

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

3.4.6.5.18 *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 1 - UDP **<input port>** - local host input port to be listened 0..65535 - port number **<closure type>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) Command returns the **OK** result code if successful. **Note:** the command to be successful requests that: - the GPRS context 1 is correctly set with +CGDCONT - the authentication parameters are set (#USERID, #PASSW) - the GPRS coverage is enough to permit a connection - the GPRS has been activated with **AT#GPRS=1**

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

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

3.4.6.5.19 *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 **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 matched, then the packet is accepted and the rule scan is finished; if criteria not matched for any chain the packet silently dropped.
AT#FRWL?	Read command reports the list of all **ACCEPT** chain rules registered in the Firewall settings in the format:

#FRWL - Firewall Setup	
	#FRWL: <ip_addr>,<net_mask> **#FRWL: <ip_addr>,<net_mask>** **….** **OK**
AT#FRWL=?	Test command returns the allowed values for parameter **<action>.**
Example	*Let assume we want to accept connections only from our devices which are on the IP addresses ranging from* *197.158.1.1 to 197.158.255.255* *We need to add the following chain to the firewall:* AT#FRWL=1,"197.158.1.1","255.255.0.0" OK
Note	For outgoing connections made with #SKTOP and #SKTD the remote host is dynamically inserted into the **ACCEPT** chain for all the connection duration. Therefore, the **#FRWL** command used only for defining the **#SKTL** behaviour, deciding which hosts allowed to connect to the local device. Rules not saved in NVM, at startup the rules list will be #FRWL: "000.000.000.000","000.000.000.000". Removing static ACCEPT chain don't guarantee removing of all dynamically added ACCEPT chains. To be sure all dynamic chains removed use AT#FRWL=2 as workaround.

3.4.6.5.20 *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 GPRS session received and transmitted, or it will report the total amount of data received and transmitted during all past GPRS sessions, since last reset. **Parameter:** **<mode>** 0 - it resets the GPRS data counter for the all the available PDP contexts (1-16) 1 - it reports the last GPRS 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

#GDATAVOL - GPRS Data Volume	
	1..16 - numeric parameter which specifies a particular PDP context definition **<totn>** - number of bytes either received or transmitted in the last GPRS session for **<cidn>** PDP context; **<sentn>** - number of bytes transmitted in the last GPRS session for **<cidn>** PDP context; **<receivedn>** - number of bytes received in the last GPRS session for **<cidn>** PDP context; 2 - it reports the total GPRS 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: <cidn>,<totn>,<sentn>,<receivedn>[<CR><LF>** **#GDATAVOL: <cidm>,<totm>,<sentm>,<receivedm>[…]]** **where:** **<cidn>** - PDP context identifier 1..16 - numeric parameter which specifies a particular PDP context definition **<totn>** - number of bytes either received or transmitted, in every GPRS session since last reset, for **<cidn>** PDP context; **<sentn>** - number of bytes transmitted, in every GPRS session since last reset, for **<cidn>** PDP context; **<receivedn>** - number of bytes received, in every GPRS session since last reset, for **<cidn>** PDP context; **Note:** last GPRS session counters not saved in NVM so they are loosen at power off. **Note:** total GPRS session counters saved on NVM.
AT#GDATAVOL=?	Test command returns the range of supported values for parameter **<mode>.**

3.4.6.5.21 *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 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.**(default) 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,

#ICMP – ICMP Ping Support	
	in the format: **#ICMP: <mode>**
AT#ICMP=?	Test command reports the supported range of values for the **<mode>** parameter.

3.4.6.5.22 *Send PING request - #PING*

#PING – Send PING request	
AT#PING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>[,<pdpId>]]]]]	This command is used to send Ping Echo Request messages and to receive the corresponding Echo Reply. **Parameters:** **<IPaddr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query **<retryNum>** - the number of Ping Echo Request to send 1-64 (default 4) **<len>** - the lenght 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) **<pdpId>** PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition **(default 1)** Once the single Echo Reply message is receive a string like that is displayed: #PING: <replyId>,<Ip Address>,<replyTime>,<ttl> **Where:** **<replyId>** - Echo Reply number **<Ip Address>** - IP address of the remote host **<replyTime>** - time, in 100 ms units, required to receive the response **<ttl>** - time to live of the Echo Reply message **Note 1**: when the Echo Request timeout expires (no reply received on time) the response will contain <replyTime> set to 600 and <ttl> set to 255 **Note 2:** To receive the corresponding Echo Reply is not required to enable separately AT#ICMP **Note 3:** Before send PING Request the GPRS context must have been activated by AT#SGACT=1,1
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

3.4.6.5.23 *DNS from Network - #NWDNS*

#NWDNS – DNS from Network	**SELINT 2**
AT#NWDNS=[<cid>[,<cid>[,…]]]	Execution command returns either the primary and secondary DNS addresses for the GSM context (if specified) and/or a list of primary and secondary DNS addresses for the specified PDP context identifiers. **Parameters:** **<cid>** - context identifier 0 - specifies the GSM context (see +GSMCONT). 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 (or GSM) context activation.
AT#NWDNS=?	Test command returns a list of defined <cid>s.

3.4.6.5.24 *Maximum TCP Payload Size - #TCPMAXDAT*

#TCPMAXDAT – Maximum TCP Payload Size	
AT#TCPMAXDAT=<size>	Set command allows setting the maximum TCP payload size in TCP header options. **Parameter:** **<size>** - maximum TCP payload size accepted in one single TCP/IP datagram. It is sent in TCP header options in SYN packet. 0 - the maximum TCP payload size is automatically handled by module (default). 496..1420 - maximum TCP payload size
AT#TCPMAXDAT?	Read command reports the current maximum TCP payload size, in the

#TCPMAXDAT – Maximum TCP Payload Size	
	format: **#TCPMAXDAT: <size>**
AT#TCPMAXDAT=?	Test command reports the supported range of values for parameter **<size>**

3.4.6.5.25 *TCP Reassembly - #TCPREASS*

#TCPREASS – TCP Reassembly	
AT#TCPREASS=<n>	Set command enables/disables the **TCP reassembly feature**, in order to handle fragmented TCP packets. **Parameter:** **<n>** 1 - enable TCP reassembly feature(default)
AT#TCPREASS?	Read command returns whether the TCP reassembly feature is enabled or not, in the format: **#TCPREASS: <n>**
AT#TCPREASS=?	Test command returns the supported range of values for parameter **<n>**.

3.4.6.5.26 *Configure the TCP window size- #TCPMAXWIN*

#TCPMAXWIN – Configure TCP window size	
AT#TCPMAXWIN=[<winSize>]	This command permits to configure the TCP window size. **Parameters:** **<winSize>** - TCP window size. 0 – TCP window size is handled automatically by the module (default) 536-65535 – TCP window size value **Note:** command has to be set before opening socket connection (#SD, #SL/SA, #FTPOPEN/GET/PUT…) to take effect. **Note:** it permits to slow down TCP when application wants to retrieve data slowly (for instance: cmd mode), to avoid early RST from server. **Note:** the value set by command is directly stored in NVM.
AT#TCPMAXWIN?	Read command reports the currently selected <winSize> in the format: **#TCPMAXWIN: <winSize>**
AT#TCPMAXWIN=?	Test command reports the supported range of values for parameter **<winSize>**

3.4.6.5.27 *Ethernet Control Model setup - #ECM*

#ECM – Ethernet Control Model setup	SELINT 2
AT#ECM=<Cid>,<Did>[,<UserId>,[<Pwd>,[<DhcpServerEnable>]]]	This command sets up an Ethernet Control Model (ECM) session. Parameters: **<Cid>** - Context id **<Did>** - Device id, currently limited to 0 (only one device) **<UserId>** - string type, used only if the context requires it **<Pwd>** - string type, used only if the context requires it **<DhcpServerEnable>** - dhcp server abilitation: 0 – disabled 1 – enabled (default) Note: this command activates a context, so all necessary setup has to be done before it (registration, APN).
AT#ECM?	Read command returns the session state in the following format: **# ECM: <Did>,<State>** **...** **OK** where **<Did>** is currently 0 and **<State>** can be: 0 - disabled 1 - enabled
AT#ECM=?	Test command returns the range of supported values for all the parameters.

3.4.6.5.28 *Ethernet Control Model configure- #ECMC*

#ECMC – Ethernet Control Model configure	SELINT 2
AT#ECMC=<Did>,<Parid>,<Address>	This command configures an Ethernet Control Model (ECM) session. Parameters: **<Did>** - Device id, currently limited to 0 (only one device) **<Parid>** - Parameter id: 0 – custom address

	1 – custom mask 2 – custom gateway 3 – custom dns 1 4 – custom dns 2 5 – custom mac address **<Address>** - Parameter id: a valid IP address in the format xxx.xxx.xxx.xxx Note: if no choosing ip with the client mac address, ecm will provide random ip to the client. Note**:** when choosing parid mac address the <Address> format is XX:XX:XX:XX:XX:XX Note: if choosing custom mac address without custom ip address it will assign the ip 192.168.225.4 as default to the chosen mac address. Note: set the custom mac address with 00:00:00:00:00:00 will ignore the mac address choice. Note: if a parameter is different from 0.0.0.0 then it is used instead the default one. Note**:** changes will apply on the next ECM session and not the current one.
AT#ECMC?	Read command returns the last session configuration in the following format: **#ECMC:** **<Did>,<State>,<Address>,<Address_Mask>,<Address_Gateway>,<Address_Dns1>,<Address_Dns2>,<Address_Custom>,<Address_CustomMask>,<Address_CustomGateway>,<Address_CustomDns1>,<Address_CustomDns2>,<Mac_Address>** **...** **OK** where **<Did>** is currently 0 **<State>** can be: 0 - disabled 1 – enabled **<Address>** is the default IP address **<Address_Mask>** is the default mask obtained from IP address **<Address_Gateway>** is the default IP address of gateway, obtained from IP address **<Address_Dns1>** is the IP address of the first DNS server, assigned by the network

	<Address_Dns2> is the IP address of the second DNS server, assigned by the network **<Address_Custom>** is the custom IP address **<Address_CustomMask>** is the custom mask **<Address_CustomGateway>** is the custom IP address of gateway **<Address_CustomDns1>** is the custom IP address of the first DNS server **<Address_CustomDns2>** is the custom IP address of the second DNS server **< Mac_Address>** is the client mac address that gets the IP address Note**:** for each custom parameter, if not assigned by the user will return 0.0.0.0 Note**:** read command does not return the current address.
AT#ECMC=?	Test command returns the range of supported values for all the parameters.

3.4.6.5.29 *Ethernet Control Model shutdown- #ECMD*

#ECMD – Ethernet Control Model shutdown	**SELINT 2**
AT#ECMD=<Did>	This command is used to shutdown an Ethernet Control Model (ECM) session. Parameters: **<Did>** - Device id, currently limited to 0 (only one device) Note: this command also deactivates the context.
AT#ECMD?	Read command returns the session state in the following format: **# ECM: <Did>,<State>** **...** **OK** where **<Did>** is currently 0 and **<State>** can be: 0 - disabled 1 - enabled
AT#ECMD=?	Test command returns the range of supported values for all the parameters.

3.4.6.6 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.
Note: #CSURVEXT still not implemented, so all dependent settings work as if #CSURVEXT=0
List of ported AT Commands:
#CSURV (LTE Currently work only if module camped on LTE cell)
#CSURVC (LTE Currently work only if module camped on LTE cell)
#CSURVU (LTE Currently work only if module camped on LTE cell)
#CSURVUC (LTE Currently work only if module camped on LTE cell)
#CSURVB (not supported for LTE)
#CSURVBC (not supported for LTE)
#CSURVF (supported for LTE)
#CSURVNLF (supported for LTE)
#CSURVP (not supported for LTE)
#CSURVPC (not supported for LTE)

3.4.6.6.1 *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 2G **(For BCCH-Carrier)** **arfcn:** <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[<arfcn64>]] [numChannels: <numChannels> array: [<ba1> ..[<ba32>]] [pbcch: <pbcch> [nom: <nom> rac: <rac> spgc: <spgc> pat:

	<pat> nco: <nco> t3168: <t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh: <pcMeasCh>]]] <CR><LF><CR><LF><CR><LF> **where:** **<arfcn>** - C0 carrier assigned radio channel (BCCH - Broadcast Control Channel). **<bsic>** - base station identification code; if #CSURVF last setting is 0, **<bsic>** is a decimal number, else it is a 2-digits octal number. **<rxLev>** - decimal number; it is the receiption level (in dBm). **<ber>** - decimal number; it is the bit error rate (in %). **<mcc>** - hexadecimal 3-digits number; it is the mobile country code. **<mnc>** - hexadecimal 2-digits number; it is the mobile network code. **<lac>** - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number. **<cellId>** - cell identifier; if #CSURVF last setting is 0, **<cellId>** 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. **<numArfcn>** - number of valid channels in the Cell Channel Description. **<arfcn*n*>** - arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**) **<numArfcn>** - decimal number; it is the number of valid channels in the Cell Channel Description. **<arfcn*n*>** - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**). **<numChannels>** - decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last #CSURVEXT setting: If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. **<ba*n*>** - decimal number; it is the arfcn of a valid channel in the BA list (***n*** is in the range **1..<numChannels>**); the output of this information for non-serving cells depends on last #CSURVEXT setting: Iif **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier.

	(The following informations will be printed only if GPRS is supported in the cell) **<pbcch>** - packet broadcast control channel 0 - pbcch not activated on the cell 1 - pbcch activated on the cell **<nom>** - network operation mode 1 2 3 **<rac>** - routing area code 0..255 - **<spgc>** - SPLIT_PG_CYCLE support ..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell ..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell **<pat>** - priority access threshold 0 - 3..6 - **<nco>** - network control order 0..2 - **<t3168>** - timer 3168 **<t3192>** - timer 3192 **<drxmax>** - discontinuous reception max time (in seconds) **<ctrlAck>** - packed control ack **<bsCVmax> -** blocked sequenc countdown max value **<alpha> -** alpha parameter for power control **<pcMeasCh> -** type of channel which shall be used for downlink measurements for power control 0 - BCCH 1 - PDCH **(For non BCCH-Carrier)** **arfcn: <arfcn> rxLev: <rxLev>** **where:** **<arfcn>** - decimal number; it is the RF channel **<rxLev>** - decimal number; it is the receiption level (in dBm) In 3G **uarfcn: <uarfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> scr code: <scrcode> cellId: <cellId> lac: <lac> cellStatus: <cellStatus>** **<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. 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	(2G) AT#CSURV Network survey started…

	arfcn: 48 bsic: 24 rxLev: -52 ber: 0.00 mcc: 610 mnc: 1 lac: 33281 cellId: 3648 cellStatus: CELL_SUITABLE numArfcn: 2 arfcn: 30 48 numChannels: 5 array: 14 19 22 48 82 arfcn: 14 rxLev: 8 Network survey ended OK (wcdma) at#csurv Network survey started ... uarfcn: 10812 rxLev: -87 mcc: 450 mnc: 08 scr code: 6528 cellId: 10683976 lac: 5121 cellStatus: CELL_LOW_PRIORITY uarfcn: 10713 rxLev: -87 mcc: 450 mnc: 05 scr code: 1200 cellId: 2171648 lac: 8209 cellStatus: CELL_LOW_PRIORITY Network survey ended OK
Note	1. The command is executed within max. 2 minute.

3.4.6.6.2 *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 2G **(For BCCH-Carrier)** **<arfcn>,<bsic>,<rxLev>,<ber>,<mcc>,<mnc>,<lac>,<cellId>,** **<cellStatus>,<numArfcn>[,<arfcn1> ..[<arfcn64>]]** **[,<numChannels>[,<ba1> ..[<ba32>]][,<pbcch>[,<nom>,<rac>,<spgc> <pat>** **<nco> <t3168> <t3192> <drxmax> <ctrlAck>** **<bsCVmax>,<alpha>,<pcMeasCh>]]]** **<CR><LF><CR><LF><CR><LF>** **where:** **<arfcn>** - C0 carrier assigned radio channel (BCCH - Broadcast Control Channel).

	<bsic> - base station identification code; if #CSURVF last setting is 0. **<bsic>** is a decimal number, else it is a 2-digits octal number. **<rxLev>** - decimal number; it is the receiption level (in dBm). **<ber>** - decimal number; it is the bit error rate (in %). **<mcc>** - hexadecimal 3-digits number; it is the mobile country code. **<mnc>** - hexadecimal 2-digits number; it is the mobile network code. **<lac>** - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number. **<cellId>** - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number. **<cellStatus>** - string 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). **<numArfcn>** - decimal number; it is the number of valid channels in the Cell Channel Description **<arfcn*n*>** - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**) **<numChannels>** - decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last #CSURVEXT setting: If **#CSURVEXT=0** this information is displayed only for serving cell If **#CSURVEXT=1 or 2** this information is displayed also for every valid scanned BCCH carrier. **<ba*n*>** - decimal number; it is the arfcn of a valid channel in the BA list (***n*** is in the range **1..<numChannels>**); the output of this information for non-serving cells depends on last #CSURVEXT setting: If **#CSURVEXT=0** this information is displayed only for serving cell If **#CSURVEXT=1 or 2** this information is displayed also for every valid scanned BCCH carrier. *(The following informations will be printed only if GPRS is supported in the cell)* **<pbcch**> - packet broadcast control channel 0 - pbcch not activated on the cell 1 - pbcch activated on the cell **<nom**> - network operation mode 1 2 3

	<rac> - routing area code 0..255 **<spgc>** - SPLIT_PG_CYCLE support ..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell ..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell **<pat>** - priority access threshold. 0 3..6 **<nco>** - network control order. 0..2 - **<t3168>** - timer 3168. **<t3192>** - timer 3192. **<drxmax>** - discontinuous reception max time (in seconds). **<ctrlAck>** - packed control ack. **<bsCVmax> -** blocked sequenc countdown max value. **<alpha> -** alpha parameter for power control. **<pcMeasCh> -** type of channel which shall be used for downlink measurements for power control. 0 - BCCH 1 - PDCH **(For non BCCH-Carrier)** **<arfcn>,<rxLev>** **where:** **<arfcn>** - decimal number; it is the RF channel **<rxLev>** - decimal number; it is the receiption level (in dBm) In 3G **<uarfcn>,<rxLev>,<mcc>,<mnc>,<scrcode>,<cellId>,<lac>,<cellStatus>** **<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. 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… 48,24,-52,0.00,610,1,33281,3648,0,2,30 48,5,14 19 22 48 82 14,8 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.

3.4.6.6.3 *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), EARFCN (in case of 4G)) **Note:** the <chn> must be selected in same RAT.
Example	AT#CSURVU=59,110 Network survey started… arfcn: 59 bsic: 16 rxLev: -76 ber: 0.00 mcc: 546 mnc: 1 lac: 54717 cellId: 21093 cellStatus: CELL_SUITABLE numArfcn 2 arfcn: 36 59 arfcn: 110 rxLev: -107 Network survey ended OK
Note	The command is executed within max. 2 minute.

3.4.6.6.4 *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=59,110 Network survey started… 59,16,-76,0.00,546,1,54717,21093,0,2,36 59 110,-107 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.

3.4.6.6.5 *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

3.4.6.6.6 *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:** **<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.

3.4.6.6.7 *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>.

3.4.6.6.8 *<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: <value>
AT#CSURVNLF=?	Test command reports the range of values for parameter <value>.

3.4.6.6.9 *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

3.4.6.6.10 *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

3.4.6.6.11 *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

3.4.6.7 SIM Toolkit AT Commands

3.4.6.7.1 *SIM Toolkit Interface Activation - #STIA*

#STIA - SIM Toolkit 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 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..255 - time-out in minutes (default 10). Any ongoing (but unanswered) proactive command will be aborted automatically after <timeout> minutes. In this 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)
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:
#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) 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. 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

	<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. 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).

3.4.6.7.2 *SIM Toolkit Information - #STGI*

#STGI - SIM Toolkit 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 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) **#STGI: <cmdType>[,<text>]**

	where: **<text>** - text to be displayed to user if <cmdType>=33 (DISPLAY TEXT) **#STGI: <cmdType>,<cmdDetails>[,<text>][,<duration>]** 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 **<duration>** - Time duration 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.

3.4.6.7.3 *SIM Tookit Send Response - #STSR*

#STSR - SIM Tookit Send Response	
AT#STSR=[<cmdType>,<userResponse>	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:**

[,<data>]]	**<cmdType>** - integer type; proactive command ID according to GSM 11.14 (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 icons 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: **#STSRI: <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#STSR=?	Test command returns the range for the parameters <state> and <cmdType>.

3.4.6.8 Phonebook AT Commands Set

3.4.6.8.1 *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

3.4.6.8.2 *Read 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)

3.4.6.9 SAP AT Commands Set

3.4.6.9.1 *Remote SIM Enable - #RSEN*

#RSEN – Remote SIM Enable	
AT#RSEN=<mode>[, <sapformat>[, <role>[, <muxch>[, <beacon>]]]]	Set command used to enable/disable the Remote SIM feature. The command returns **ERROR** if requested on a non-multiplexed interface. **Parameter:** **<mode>** 0 - disable 1 - enable **<sapformat>** 0 - X-SAP (unsupported) 1 - binary SAP (default) **<role>** 0 - remote SIM Client (default) 1 - remote SIM Server (unsupported) **<muxch>-** MUX Channel Number; mandatory if <mode>=1 and **<sapformat>**=1 1..3 **<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:

#RSEN – Remote SIM Enable	
	- 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.

3.4.6.10 E-mail Management AT Commands

3.4.6.10.1 *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. 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?	SMTP server can be specified as IP address or as nick name.
AT#ESMTP=?	Read Command reports the current SMTP server address, in the format: **#ESMTP: <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.

3.4.6.10.2 *E-mail sender address - #EADDR*

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

	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

3.4.6.10.3 *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 GPRS authentication (see #PASSW).

3.4.6.10.4 *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.

#EUSER - E-mail Authentication User Name	
	(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 GPRS authentication (see **#USERID**).

3.4.6.10.5 *E-mail Sending With GPRS Context Activation - #SEMAIL*

#SEMAIL - E-mail Sending With GPRS Context Activation	
AT#SEMAIL=[<da>,<subj>]	Execution command activates a GPRS context, if not previously activated by #EMAILACT, and sends an e-mail message. The GPRS context is deactivated when the e-mail is sent. **Parameter:** **<da>** - destination address, string type. **<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.
AT#SEMAIL=?	Test command returns the OK result code.
Example	AT#SEMAIL="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.*
Note	This command is obsolete. It"s suggested to use the couple #EMAILACT and #EMAILD instead of it. When SMTP over SSL is enabled, this command will not activate a GPRS context. Instead, use #EMAILACT before.

3.4.6.10.6 *E-mail GPRS Context Ativation - #EMAILACT*

#EMAILACT - E-mail GPRS Context Ativation	
AT#EMAILACT=[<mode>]	Execution command deactivates/activates the GPRS context, eventually proceeding with the authentication with the parameters given with #PASSW and #USERID. **Parameter:** **<mode>** - GPRS context activation mode 0 - GPRS context deactivation request 1 - GPRS context activation request
AT#EMAILACT?	Read command reports the current status of the GPRS context for the e-mail, in the format: **#EMAILACT: <status>** **where:** **<status>** 0 - GPRS context deactivated. 1 - GPRS context activated
AT#EMAILACT=?	Test command returns the allowed values for parameter <mode>.
Example	AT#EMAILACT=1 OK • *Now GPRS Context has been activated* AT#EMAILACT=0 OK • *Now GPRS context has been deactivated.*

3.4.6.10.7 *E-mail Sending - #EMAILD*

#EMAILD - E-mail Sending

AT#EMAILD=[<da>,<subj>]	Execution command sends an e-mail message if GPRS context has already been activated with AT#SGACT=1,1 or AT#EMAILACT=1 or AT#GPRS=1. **Parameter:** **<da>** - destination address, string type. <**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 1500 trying to send more data will cause the surplus to be discarded and lost.
AT#EMAILD=?	Test command returns the OK result code.
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.*
Note	The only difference between this command and the #SEMAIL is that this command does not interact with the GPRS context status, leaving it ON or OFF according to the #EMAILACT setting, thus, when the connection made with #EMAILD is closed, the context status is maintained.

3.4.6.10.8 *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.

3.4.6.10.9 *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 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.

3.4.6.10.10 *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.

3.4.6.10.11 *Configre SMTP parameters - #SMTPCFG*

#SMTPCFG – configure SMTP parameters	
AT#SMTPCFG= <ssl_enabled>[, <port>[,	This command sets the parameters needed to the SMTP connection **Parameters:** **<ssl_enabled>** - Numeric parameter indicating if the SSL encryption is enabled.

#SMTPCFG – configure SMTP parameters	
<mode>[, <UNUSED_1>[, <UNUSED_2>[, <UNUSED_3>]]]]]	**0** – SSL encryption disabled (default) **1** – SSL encryption enabled **<port> -** SMTP port to contact (default 25) 1-65535. **<mode>** - SMTP start session command **0** – SMTP start session command HELO (default) **1** – SMTP start session command EHLO **Note:** some servers support an obsolete implementation of SMTPS on port 465. The module only supports the standard implementation of SMTP over SSL/TLS described in RFC 3207. So do not use port 465 on servers with an obsolete implementation of SMTPS: the module will not work properly. Use instead port 25 or port 587. **Note:** <mode> not implemented and should be 0.
AT#SMTPCFG?	Read command returns the current settings in the format: #SMTPCFG: <ssl_enabled>,<port>,<mode>,0,0,0<CR><LF>
AT#SMTPCFG=?	Test command returns the supported range of parameters <ssl_enabled>, <port> and <mode> in the format: #SMTPCFG: (list of supported <ssl_enabled>s),(list of supported <port>s),(list of supported <mode>s),(0),(0),(0)

3.4.6.10.12 *Configre Email PDP Cid - #EMAILPDPCFG*

# EMAILPDPCFG – Configre Email PDP Cid	
AT#EMAILPDPCFG =<cid>	This command sets the Cid that used for email PDP Context. **Parameter:** **< Cid >** - Numeric parameter indicating the PDP Context Identifier. Range: (1-5). Default: 1 (in VZN module default is 3)
AT#EMAILPDPCFG?	Read command returns the current used Cid in the format: AT#EMAILPDPCFG? #EMAILPDPCFG: 1 OK
AT#EMAILPDPCFG =?	Test command returns the supported range : AT#EMAILPDPCFG=? #EMAILPDPCFG: (1-5) OK

# EMAILPDPCFG – Configre Email PDP Cid	

3.4.6.11 HTTP AT COMMANDS

3.4.6.11.1 *Configure HTTP parameters - #HTTPCFG*

#HTTPCFG – configure HTTP parameters	
AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout>[,<cid>]]]]]]]]	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)

#HTTPCFG – configure HTTP parameters	
	<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 **Note:** a special form of the Set command, #HTTPCFG=<prof_id>, causes the values for profile number <prof_id> to reset to default values. **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><CR><LF>[<CR><LF>#HTTPCFG: <prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>]<CR><LF>[…]]
AT#HTTPCFG =?	Test command returns the supported range of parameters <prof_id>, <server_port>, <auth_type>, <ssl_enabled>, <timeout> and <cid> 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) **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>.

3.4.6.11.2 *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

#HTTPQRY – send HTTP GET, HEAD or DELETE request	
	<command> - Numeric parameter indicating the command requested to HTTP server: 0 – GET 1 – HEAD 2 – DELETE **<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 cannot 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>.

3.4.6.11.3 *Send HTTP POST or PUT request - #HTTPSND*

#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 cannot 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>

#HTTPSND – send HTTP POST or PUT request	
	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#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" >>>

3.4.6.11.4 *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. **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>)

3.4.6.12 GPS AT Commands Set

3.4.6.12.1 *GPS Power Management - $GPSP*

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

$GPSP – GPS Power Management	
Example	AT$GPSP=0 OK
Note	- Power up clears GPS memory and then starts the GPS receiver. GPS data cleaning is performed on the base of the current value of the <**reset_type**> parameter (see $GPSR). - GPS operation mode is performed on the base of the current values of $GPSSLSR configuration (see $GPSSLSR). - <**status**> value is stored through $GPSSAV command.

3.4.6.12.2 *GPS Module Reset - $GPSR*

$GPSR – GPS module Reset	
AT$GPSR= <reset_type>	Execution command allows to reset the GPS controller. **Parameter:** **<reset_type>** **0** – **Factory Reset**: this option clears all GPS memory including clock drift (See note). **1 - Coldstart** (No Almanac, No Ephemeris): this option clears all data that is currently stored in the internal memory of the GPS receiver including position, almanac, ephemeris, and time. The stored clock drift however, is retained. **2 - Warmstart** (No ephemeris): this option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The almanac is retained but the ephemeris is cleared. **3 - Hotstart** (with stored Almanac and Ephemeris): the GPS receiver restarts by using the values stored in the internal memory of the GPS receiver; validated ephemeris and almanac.
AT$GPSR?	Read command displays the current <**reset_type**> value (see note).
AT$GPSR=?	Test command reports the range of supported values for parameter <reset_type>
Example	AT$GPSR=0 OK
Note	- '**Factory Reset**' performs the same operation as '**Coldstart**'. - The current setting is stored through $GPSSAV command. - <**reset_type**> sets the kind of start when GPS is activated through $GPSP or $GPSSLSR commands. - Default value of <**reset_type**> is '3', 'hot start'.

3.4.6.12.3 *Get Acquired Position - $GPSACP*

$GPSACP - Get Acquired Position	
AT$GPSACP	Execution command returns information about the last GPS position in the format: **$GPSACP:** <UTC>,<latitude>,<longitude>,<hdop>,<altitude>, <fix>,<cog>,<spkm>,<spkn>,<date>,<nsat> **where:** **<UTC>** - UTC time (hhmmss.sss) referred to GGA sentence **<latitude>** - format is ddmm.mmmm N/S (referred to GGA sentence) **where:** dd – degrees - 00..90 mm.mmmm - minutes - 00.0000..59.9999 N/S: North / South **<longitude>** - format is dddmm.mmmm E/W (referred to GGA sentence) **where:** ddd - degrees - 000..180 mm.mmmm - minutes - 00.0000..59.9999 E/W: East / West **<hdop>** - x.x - Horizontal Diluition of Precision (referred to GGA sentence) **<altitude>** - xxxx.x Altitude - mean-sea-level (geoid) in meters (referred to GGA sentence) **<fix> -** 0 or 1 -Invalid Fix 2 - 2D fix 3 - 3D fix **<cog>** - ddd.mm - Course over Ground (degrees, True) (referred to VTG sentence) **where:** ddd - degrees - 000..360 mm – minutes - 00..59 **<spkm>** - xxxx.x Speed over ground (Km/hr) (referred to VTG sentence) **<spkn>** - xxxx.x- Speed over ground (knots) (referred to VTG sentence) **<date>** - ddmmyy Date of Fix (referred to RMC sentence) **where:** dd - day - 01..31 mm – month - 01..12 yy – year - 00..99 - 2000 to 2099 **<nsat>** - nn - Total number of satellites in use (referred to GGA sentence) - 00..12
AT$GPSACP?	Read command has the same meaning as the Execution command.
AT$GPSACP=?	Test command returns the OK result code.
Example	at$gpsp? $gpsp: 0 <when module is down there no aquired position>

$GPSACP - Get Acquired Position	
	at$gpsacp $GPSACP: 000000.000,,,,,0,,,,000000,00 OK at$gpsp=1 OK <Until first fix is received the command will display initial GPS position> at$gpsacp $GPSACP: 3124.6000N,03504.2000E,0.0,-18.0,0,0.0,0.0,0.0,060180,00 <Once fix has been received the command will display actual GPS position> OK at$gpsacp $GPSACP: 3206.4020N,03450.2678E,1.1,3.3,0,0.0,0.0,0.0,030613,06 OK
Reference	NMEA 01803 Specifications.

3.4.6.12.4 *Unsolicited NMEA Data Configuration - $GPSNMUN*

$GPSNMUN - Unsolicited NMEA Data Configuration	
AT$GPSNMUN=<enable>[,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG >]	Set command permits to activate an Unsolicited streaming of GPS data (in NMEA format) through the standard GSM serial port and defines which NMEA sentences will be available Parameters: **<enable>** 0 - NMEA data stream de-activated (default). 1 - NMEA data stream activated with the following unsolicited response syntax: **$GPSNMUN: <NMEA SENTENCE><CR>** 2 - NMEA data stream activated with the following unsolicited response syntax: **<NMEA SENTENCE><CR>** 3 - Dedicated NMEA data stream. it is not possible to send AT commands; With the escape sequence "+++" the user can return to command mode. NMEA syntax is: **<NMEA SENTENCE><CR>** **<GGA>** - Global Positioning System Fix Data 0 - disable (default) 1 - enable **<GLL>** - Geographical Position - Latitude/Longitude 0 - disable (default) 1 - enable **<GSA>** - GPS DOP and Active Satellites 0 - disable (default) 1 - enable **<GSV>** - GPS Satellites in View 0 - disable (default) 1 - enable **<RMC>** - recommended Minimum Specific GPS Data 0 - disable (default) 1 - enable **<VTG>** - Course Over Ground and Ground Speed 0 - disable (default) 1 - enable
AT$GPSNMUN?	Read command returns whether the unsolicited GPS NMEA data streaming is currently enabled or not, along with the NMEA sentences availability status, in the format: **$GPSNMUN:<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>**
AT$GPSNMUN=?	Test command returns the supported range of values for parameters **<enable>, <GGA>, <GLL>, <GSA>, <GSV>, <RMC>, <VTG>**
Example	AT$GPSNMUN=1,0,0,1,0,0,0 OK These sets the GSA as available sentence in the unsolicited message AT$GPSNMUN=0

	OK Turn-off the unsolicited mode AT$GPSNMUN? $GPSNMUN: 1,0,0,1,0,0,0 OK Give the current frame selected (GSA) The unsolicited message will be: $GPSNMUN: $GPGSA,A,3,23,20,24,07,13,04,02,,,,,,2.4,1.6,1.8*3C
Reference	NMEA 01803 Specifications

3.4.6.12.5 *Save GPS Parameters Configuration - $GPSSAV*

$GPSSAV - Save GPS Parameters Configuration	
AT$GPSSAV	Execution command stores the current GPS parameters in the NVM of the device.
AT$GPSSAV=?	Test command returns the 'OK' result code
Example	AT$GPSSAV OK
Note	The saved parameters are those of : $GPSP, $GPSR, $GPSNMUN, $GPSNMUNEX, $GPSQOS, $GPSSLSR, $GPSSTOP and $GPSAT commands.

3.4.6.12.6 *Restore to Default GPS Parameters - $GPSRST*

$GPSRST - Restore To Default GPS Parameters	
AT$GPSRST	Execution command resets the GPS parameters to "Factory Default" configuration and stores them in the NVM of the device.
AT$GPSRST=?	Test command returns the 'OK' result code.
Example	AT$GPSRST OK
Note	The restored parameters are those of : $GPSP, $GPSR, $GPSNMUN, $GPSNMUNEX, $GPSQOS, $GPSSLSR, $GPSSTOP and $GPSAT commands (see their default value at each command description) The module must be restarted to use the new configuration

3.4.6.12.7 *GPS Antenna Supply Voltage Readout - $GPSAV*

$GPSAV - GPS Antenna Supply Voltage Readout	
AT$GPSAV	Execution command returns the measured GPS antenna's supply voltage in Mv.

AT$GPSAV?	Read command has the same meaning as the Execution command
AT$GPSAV=?	Test command returns the OK result code
Note	In LE9x0, gps antenna is passive, so this command has no real meaning. It exists for backward compatibility.

3.4.6.12.8 *GPS Antenna Type Definition - $GPSAT*

$GPSAT - GPS Antenna Type Definition	
AT$GPSAT=<type>	Set command selects the GPS antenna used. **Parameter <type> :** 0 - GPS Antenna not power supplied by the module 1 - GPS Antenna power supplied by the module (default)
AT$GPSAT?	Read command returns the currently used antenna, in the format: **$gpsat: <type>**
AT$GPSAT=?	Test command returns the valid range values of <type> parameter. **at$gpsat=?** **$gpsat: (0,1)**
Note	The current setting is stored through $GPSSAV. This command has no real meaning. It exists for backward compatibility.

3.4.6.12.9 *Set the GNSS (or GLONASS) Capability - $GPSGLO*

$GPSGLO – Set the GNSS (or GLONASS) Capability	
AT$GPSGLO=<type>	Set command selects the GNSS (or GLONASS)capability used. **Parameter:** **<type>** 0 – Disable GNSS(or GLONASS) 1 – Enable GNSS(or GLONASS) (default)
AT$GPSGLO?	Read command returns the currently used GNSS(or GLONASS), in the format: $GPSGLO: **<type>**
AT$GPSGLO=?	Test command reports the range of supported values for parameter **<type>**

$GPSGLO – Set the GNSS (or GLONASS) Capability	
Note	This command saved in NVM and has effect only at the next power cycle.
Example	AT$GPSGLO=1 OK

3.4.6.12.10 *Unsolicited NMEA Extended Data Configuration - $GPSNMUNEX*

$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration	
AT$GPSNMUNEX= <GNGNS>,<GNGSA>, <GLGSV>,<GPGRS>	Set command activates an Unsolicited streaming of GNSS(GPS, GLONASS, GALILEO and BEIDOU) data, in NMEA extended format, through the NMEA port and defines which NMEA extended sentences will be available. Parameters: <**GNGNS**> - Fix data of GNSS receivers. (see note) 0 - disable (default) 1 – enable <**GNGSA**> - DOP and active satellites of GNSS. (see note) 0 - disable (default) 1 – enable <**GLGSV**> - GLONASS satellites in view 0 - disable (default) 1 – enable <**GPGRS**> - GPS Range Residuals 0 - disable (default) 1 – enable
AT$GPSNMUNEX?	Read command returns the NMEA extended sentences availability status, in the format: $GPSNMUNEX: <**GNGNS**>,<**GNGSA**>, <**GLGSV**>, <**GPGRS**>
AT$GPSNMUNEX=?	Test command returns the supported range of values for parameters: **<GNGNS>,<GNGSA>, <GLGSV>, <GPGRS>**
Note	1. NMEA extended data is displayed on NMEA port depending on **$GPSNMUN <enable>** parameter setting. 2. **GNGNS** sentence has field '**mode indicator**'. The field is composed from the following order: gps, glonass, galileo and beidou. When gnss data is being received, there are four consecutive **GNGSA** sentences. The sentences are arranged at the following order: gps, glonass, galileo and beidou.
Example	AT$GPSNMUN=1 OK AT$GPSNMUNEX=1,1,0,0 OK

$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration	
	GNGNS and GNGSA sentences shall be displayed as an unsolicited nmea sentences. AT$GPSNMUNEX? $GPSNMUNEX: 1,1,0,0 OK The unsolicited message will be: $GNGNS,012715.10,2231.276123,N,11356.110878,E,**AAAA**,14,0.8,-10.1,-1.0,,*12 // four characters of '**A**'. For the order see note 2 $GNGSA,A,3,02,03,06,09,17,19,28,,,,,,1.1,0.8,0.8,1*3B // GPS $GNGSA,A,3,65,71,72,86,87,,,,,,,,1.1,0.8,0.8,2*33 // GLONASS $GNGSA,A,3,312,324,,,,,,,,,,1.1,0.8,0.8,3*36 // GALILEO $GNGSA,A,3,208,213,,,,,,,,,,1.2,0.9,0.8,4*3C // BEIDOU

3.4.6.12.11 *GPS Quality of Service - $GPSQOS*

$GPSQOS – GPS Quality Of Service	
AT$GPSQOS=[<horiz_accuracy>[,<vertic_accuracy>[,<rsp_time>[,<age_of_location_info>[,<location_type>[,<nav_profile>[,<velocity_request>]]]]]]]	Command used to set the location's quality of service (QoS). Parameter: **<horiz_accuracy>** (horizontal accuracy): 0 – 1800000, where 0 is highest accuracy and 1800000 is lowest accuracy in meters. Default value is 1800000 in meters **<vertic_accuracy>** (vertical accuracy): 0 – 990, where 0 is highest accuracy and 990 is lowest accuracy in meters. Default is 990 in meters **<rsp_time>** (response time): 0-14400, where 0 is the low delay and 14400 is the highest delay in seconds. Default value is 14400 in seconds. **<age_of_location_info>** (Maximum age of location): 0-1966020: Value 0 means that stored location information should not be used. Value 1966020 indicates the maximum tolerable age of the

	stored location information. The valid range of interval for SUPL (Transport protocol) is [0 - 65535] seconds & [0 - 1966020] seconds for C-plane (Transport protocol). **<location_type>** (type of location required): Used only in case of C-Plane. 0: Current Location (default) 1: Current or Last known location 2: Invalid Location, indicates that this parameter shall not be used **<nav_profile>** (navigation profile): 0: Car navigation profile (default) 1: Personal profile 2: Low speed profile 3: Invalid profile, indicates that this parameter shall not be used **< velocity_request>** (velocity information is needed): 0 FALSE 1 TRUE (default)
AT$GPSQOS?	Read command returns the current QoS values, in the format: AT$GPSQOS: **<horiz_accuracy>,<vertic_accuracy>,<rsp_time> ,<age_of_location_info>,<location_type>,< nav_profile>,< velocity_request>**
AT$GPSQOS=?	Returns the list of supported QoS values for each field. $GPSQOS: (0-1800000),(0-990),(0-14400),(0-1966020),(0-2),(0-3),(0,1)
Example	AT$GPSQOS=1800000,990,150,0,0,0 OK
Note	The current setting is stored through $GPSSAV

3.4.6.12.12 *GPS Start Location Service Request-$GPSSLSR*

$GPSSLSR – GPS Start Location Service Request

$GPSSLSR=<transport_protocol>[,<pos_mode>[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,<interval>[,<service_type_id>[,<pseudonym_indicator>],<error_mask> **]]]]]]**	Command used to start the Receiver in Autonomous or A-GPS mode. Parameter: **<transport_protocol>:** 0 - CPlane 1 - SUPL 2 – Invalid Note: If <**pos_mode** > is Autonomous the **<transport_protocol>** should be invalid. Note: If **<transport_protocol>** is CPlane and **<pos_mode >** is Pure MS Assisted, then **<interval>** should be 0 (or omitted). **<pos_mode>:** 0: Pure MS Assisted - Location estimate from the network (MS Assisted mode). 1: MS Based - Assistance Data from the network (MS Based mode). 2: Not Supported. 3: Autonomous – Autonomous GPS mode of operation. Note: If **<pos_mode>** is Autonomous the **<transport_protocol>** should be invalid. **<client_id>:** String parameter containing the ID of the LCS-Client to which the location estimate is to be transferred. Note: Max length is 64 bytes. Note: **<client_id>** is mandatory in case of A-GPS and the **<transport_protocol>** should be Cplane. Note: LE9x0 don't support <client_id> setting because of not supporting the 3rd Part Location Transfer. **<clientid_type>:** 0 – MSISDN 1 – Invalid (default) Note: **<client_id>** and **<clientid_type>** are mandatory for A-GPS mode. **<mlc_number>:** String parameter containing the address of the GMLC through which the location estimate is to be sent to the LCS-Client. Note: **<mlc_number>** is mandatory in case of A-GPS. **<mlcnumber_type>:** 0 – MSISDN 1 – Invalid (default) Note: **<mlc_number>** and **<mlcnumber_type>** are

	mandatory for A-GPS mode. **<interval>:** 0 - 7200: GPS reporting period in seconds (will be sent unsolicited). if the value is 0 then a single shot NMEA Message will be provided. Any value different from 0 sets the period (in seconds) between each NMEA Sentence. Note: If this value is not set, it is assumed to be 0. Note: The Unsolicited NMEA sentences have to be enabled with the commands AT$GPSNMUN. **<service_type_id>:** 0 - 255 where 255 indicates that this parameter shall not be used. Note: <service_type_id> is mandatory in case of A-GPS. **<pseudonym_indicator>:** 0 FALSE (default) : display user name at the external client. 1 TRUE : display user name as anonymous at the external client **<error_mask>:** 0 - 4294967295: If certain bit is set, respective error code becomes non-abortable. Note: If this value is not set, it is assumed to be 0. If C-plane or Supl session is not successfully completed, it will be stopped and unsolicited indication reports the error cause in the following formats: **$GPSSLSR: C-PLANE ERROR,<error_code>** **or** **$GPSSLSR: SUPL ERROR,<error_code>** where **<error_code>** 0 - Phone Offline 1 - No servcie 2 - No connection with PDE 3 - No data available 4 - Session Manager Busy 5 - Phone is CDMA locked 6 - Phone is GPS locked 7 - Connection failure with PDE 8 - PDSM Ended session because of Error condition 9 - User ended the session 10 - End key pressed from UI 11 - Network Session was ended 12 - Timeout (viz., for GPS Search) 13 - Conflicting request for session and level of privacy 14 - Could not connect to the Network 15 - Error in Fix 16 - Reject from PDE

	17 - Ending session due to TC exit 18 - Ending session due to E911 call 19 - Added protocol specific error type 20 - Ending because BS info is stale 21 - VX lcs agent auth fail 22 - Unknown System Error 23 - Unsupported Service 24 - Subscription Violation 25 - The desired fix method failed 26 - Antenna switch 27 - No fix reported due to no tx confirmation rcvd 28 - Network indicated a Normal ending of the session 29 - No error specified by the network 30 - No resources left on the network 31 - Position server not available 32 - Network reported an unsupported version of protocol 33 - MOLR System failure 34 - MOLR Unexpected data value 35 - MOLR Data missing 36 - MOLR Facility Not Supported 37 - MOLR Subscription Violation 38 - MOLR Position Method Failure 39 - MOLR Undefined **NOTE:** Errors [1-32] can be marked as non – abortable, using **<error_mask>,** so session will continue until stopped manually by user. **EXCEPTIONS:** Errors [9-12] are non – abortable by default, and error mask does not affect them.
AT$GPSSLSR?	Read command returns the current settings, in the format: **$GPSSLSR:** **<transport_protocol>[,<pos_mode>[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,<interval>[,<service_type_id>[,<pseudonym_indicator>][,<error_mask>]]]]]]**
AT$GPSSLSR=?	**$GPSSLSR: (0-2),(0-3),(64),(0,1),(64),(0,1),(0-7200),(0-255),(0,1),(0-4294967295)**
Example	**AT$GPSSLSR= 2,3,,,,,1** **OK**
Note	- The current setting is stored through $GPSSAV - Power up clears GPS memory and then starts the GPS receiver. GPS data cleaning is performed on the base of the current value of the <**reset_type**> parameter (see $GPSR).

3.4.6.12.13 *GPS Stop Location Service Request - $GPSSTOP*

$GPSSTOP – GPS Stop Location Service Request		
$GPSSTOP= **[<abort_cause>]**	Command used to stop the Receiver in Autonomous or A-GPS mode initiated through $GPSSLSR set command. Parameter: **<abort_cause>** 0: User denies the request 1: Unspecified cause for abort 2: Cause Invalid	
AT$GPSSTOP?	Read command returns the current value of parameter <**abort_cause**>.	
$GPSSTOP=?	OK	
Example	AT$GPSSTOP=1 OK	
Note	The current setting is stored through $GPSSAV. The default factory value is '1', it can be recovered by $GPSRST.	

3.4.6.12.14 *Update SLP address - $SLP*

$SLP - Update SLP address	
AT$SLP=<slp_address_type> **[,<slp_address:slp_port>]**	Set command allows updating the SLP address and SLP port number. Parameters: **<slp_address_type>**: SLP address type 0 - IPv4 1 - FQDN 3 – IPv6 **<slp_address>**: SLP address in FQDN format, IPv4 or IPv6 format

	<slp_port_number> : Slp Port number integer parameter. Default value is 7275. Note: If **<slp_address>** is omitted, chosen **<slp_address_type>** will be deleted. Note: The current setting is stored in NVM. **Note:** IPv6 is passed in the following format (example): AT$SLP=3,"[2001:db8:255::8:7]:7275"
AT$SLP?	Read command returns the current SLP address.
AT$SLP=?	Test command returns the range of values for parameter **$SLP: (0-1,3),("IP,URL,IPv6")**

3.4.6.12.15 *Update SLP address - $LCSSLP*

$LCSSLP - Update SLP address	
AT$LCSSLP=<slp_address_type>[,<slp_address>[,<slp_port_number>]]	Set command allows updating the SLP address and SLP port number. Parameters: **<slp_address_type>**: SLP address type 0 - IPv4 1 - FQDN 2 – Delete SLP address 3 – IPv6 **<slp_address>**: SLP address in FQDN format or IPv4 format **<slp_port_number>** : Slp Port number integer parameter. Default value is 7275. Note: If **<slp_address_type>** is 0,1 or 3, then **<slp_address>** is a mandatory parameter. Note: Other types of address are erased during set command. Note: The current setting is stored in NVM.
AT$LCSSLP?	Read command returns the current SLP address.
AT$LCSSLP=?	Test command returns the range of values for parameter **<slp_address_type> (0-3)**

3.4.6.12.16 *Update SLP address type - $SLPTYPE*

$SLPTYPE - Update SLP address

AT$SLPTYPE=<slp_address_type>	Set command allows updating the SLP address type to be chosen. **<slp_address_type>**: SLP address type 0 - IPv4 1 - FQDN 3 – IPv6 **<slp_address>**: SLP address in FQDN format, IPv4 or IPv6 formatNote: The current setting is stored in NVM. **Note:** This parameter also update during AT$SLP set command
AT$SLPTYPE?	Read command returns the current SLP address type.
AT$SLPTYPE=?	Test command returns the range of values for parameter **$SLPTYPE: (0-1, 3)**

3.4.6.12.17 *Set the User Plane Secure Transport - $SUPLSEC*

$SUPLSEC – Set the User Plane Secure Transport		
AT$SUPLSEC= <option>	Set command configures the User Plane Secure Transport **Parameter:** **<option >:** Integer type 0 - Disable User Plane Secure Transport(UPL) 1 - Enable User Plane Secure Transport(SUPL)	
AT$SUPLSEC?	Read command returns the currently used values, in the format: $SUPLSEC: **< option >**	
AT$SUPLSEC=?	Test command returns the supported range of values of parameters **< option >** **$SUPLSEC: (0-1)**	
Example	AT$SUPLSEC =1 OK AT$SUPLSEC? $SUPLSEC:1 OK	

3.4.6.12.18 *Configure SUPL TLS and Hash - $SUPLCFG*

$SUPLCFG – Configure SUPL TLS and Hash	
AT$SUPLCFG =[<tls>],[<hash >]	This command permits to configure the SUPL TLS and Hash algorithm version. **Parameters:**

$SUPLCFG – Configure SUPL TLS and Hash	
	<tls >: 0 – Use TLS v.1.0 (default) 1 – Use TLS v.1.1 **<hash >:** 0 – Use SHA-1 (default) 1 – Use SHA-256
AT$SUPLCFG ?	Read command reports the currently selected <tls> and <hash> in the format: **$SUPLCFG: <tls>,<hash>**
AT$SUPLCFG =?	Test command reports the supported range of values for parameters **<tls>** and **<hash>**

3.4.6.12.19 *Set the version of supported SUPL - $SUPLV*

$SUPLV – Set the version of supported SUPL.	
AT$SUPLV= <version>	Set command configures the version of supported SUPL. **Parameter:** **<version>:** Integer type 0 : N/S SUPL 1 : SUPL 1.0 2 : SUPL 2.0
AT$SUPLV?	Read command returns the currently used values, in the format: $SUPLV: **< version >**
AT$SUPLV=?	Test command returns the supported range of values of parameters **< version>** $SUPLV: (0-2)
Example	AT$SUPLV =1 OK AT$SUPLV? $SUPLV:1.0 OK

3.4.6.12.20 *Update location information - $LCSLUI*

$LCSLUI - Update location information	
AT$LCSLUI=<update_type>	Set command allows updating the Location information. Parameters: **<update_type>** : the current access technology 0 - GSM

	1 - WCDMA Note: the current access technology can be read with AT+COPS? Note: this command has no effect and exists only for backward compatibility
AT$LCSLUI=?	Test command returns the range of values for parameter <**update_type**>.

3.4.6.12.21 *Update terminal information - $LCSTER*

$LCSTER - Update terminal information	
AT$LCSTER=<id_type>[,<id_value>[,<pref_pos_mode>[,<tls_mode>]]]	Set command updates the terminal information like IMSI, MSISDN or IPv4 address. Parameters: **<id_type>** : is a number which can have any of the following values 0 - MSIDSN 1 - IMSI (default value) 2 - IPv4 address 3 - Invalid **<id_value>** : is a string , as defined in <**id_type**> **<pref_pos_mode>** : preferred position mode, 0 – default position mode 1 – none preferred position mode **<tls_mode>** : indicates if TLS mode should/should not be used by the SET 0 - non-TLS mode 1 - TLS mode (default value) Note: If **<id_type>** is MSISDN or IPv4 address then **<id_value>** shall be entered

3.4.6.12.22 *Enable/Disable unsolicited response - $LICLS*

$LICLS – Enable/Disable unsolicited response	
AT$LICLS =<mode>	Set command is used to enable/disable unsolicited $LICLS response. Parameter:

	<mode> 0 – disable unsolicited 1 – enable unsolicited (default value) The unsolicited result code is in the format: $LICLS: **<request_type>[,<cid>]** Where **<request_type>** 0 – Setup Request to setup the control link 1 – Release Request to release the control link **<cid>** : id associated to the context that shall be deactivated (see +CGDCONT) If the <**request_type**> is a setup request, the unsolicited indication is sent/used to request the client to define, setup, activate and prepare the pdp-context. If <**request_type**> is a release request, the unsolicited indication is sent/used to inform the client that the pdp-context (associated with this command type) including the associated terminal is not used any more, and shall be deactivated. Note: The current setting is stored in NVM.
AT$LICLS?	Read command returns the current value of parameter <**mode**>.
AT$LICLS=?	Test command returns the range of values for parameter <**mode**>.

3.4.6.12.23 *LCS certificate - $LTC*

$LTC – LCS certificate	
AT$LTC=<string>,<total_message_length>,<seq_no>,<Security_Object_Type>	Set command is used to pass the security objects (e.g. certificate, key) to the Transport Layer Security Protocol (binary string). The certificate shall be in hexadecimal format (each octet of the certificate is given as two IRA character long hexadecimal number). Parameter: **<string>** - the string certificate segment (max 300 characters per segment) **<total_message_length>** - The total size of the certificate to be received 1-4096 **<seq_no>** - The sequence number of the segment. 1-13

	<Security_Object_Type> 0: Root Certificate NOTE: The last two certificates are stored in NVM.
AT$LTC	Execution command deletes the certificates stored in NVM.
AT$LTC?	Read command provides the first 300 characters of each valid certificate stored in NVM in the format: **$LTC: <string>,<total_message_length>,1, <Security_Object_Type>** If no certificate is stored the read command provides: **$LTC: “”,0,1 ,<Security_Object_Type>**
AT$LTC=?	Test command returns the range of values for parameters **<total_message_length>**,**<seq_no>** and **<Security_Object_Type>**

3.4.6.12.24 *Lock context for LCS use - $LCSLK*

$LCSLK – Lock context for LCS use	
AT$LCSLK=<mode>[,<cid>]	Set command is used to reserve a cid for LCS. Parameters: **<mode>** 0 – unlock the current cid available for LCS use NOTE: No CID should be specified. Locked one will be released automatically. 1 – lock the specified cid in order to setup a control link for LCS use only **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition Note: **<cid>** is mandatory if **<mode>** is set to lock, otherwise shall be omitted. Note: the set command returns ERROR if the current cid and/or the previously set are in use. Note: The current setting is stored in NVM.
AT$LCSLK?	Read command returns the current value of parameters **<mode>** and **<cid>** (if **<mode>** is lock).
AT$LCSLK=?	Test command returns the range of values for parameters **<mode>** and **<cid>**

3.4.6.12.25 *Clear GPS Data - $GPSCLRX*

$GPSCLRX – Clear GPS Data	
AT$GPSCLRX	This command resets all of the parameters related with GPS Resets all parameters related with GPS as following: -GPS Almanac Data -GPS Ephemeris Data -LBS User Plane PDE IP Address -LBS User Plane PDE IP Port Note: This command is global and cannot clear individual pieces of data.
AT$GPSCLRX =?	Test command returns the OK result code
Example	AT$GPSCLRX=? OK AT$GPSCLRX OK

3.4.6.13 SMS AT Commands

3.4.6.13.1 *Move Short Message to other memory - #SMSMOVE*

#SMSMOVE – Move Short Message to other	
AT#SMSMOVE=<index>	Execution command moves selected Short Message from current memory to destination memory. **Parameter:** **<index>** - message index in the memory selected by +CPMScommand. 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

#SMSMOVE – Move Short Message to other	
	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 +CPMScommand. 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#SMSMOVE?
	#SMSMOVE: "ME",3,100,"SM",0,50
	
	OK
	//the current memory is ME where 3 SMs are stored; the destination memory is SIM that is empty
	
	AT+CMGL=ALL
	+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",1,50
	
	OK

#SMSMOVE – Move Short Message to other	
	//now we have 2 SMs in ME and 1 in SIM

3.4.6.13.2 *SMS Commnads 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 (default) 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
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>

3.5 Custom AT Commands

3.5.1.1.1 *Dormant Control Command - #CDORM*

#CDORM – Dormant control command	
AT#CDORM= <action> [,<cal_id>]	Set command used to: 1. Enable/Disable the indication of dormant mode. 2. Fast dormancy 3. Exit from 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>**

#CDORM – Dormant control command	
	Where: **<dormant_status>** - 0 – call is in dormant mode 1 – call is in active mode 2 - Go to dormant(fast dormancy) 3 - Exit dormant for **<call_id>** or first found call id if no <call_id> mentioned. **<call_id>** - Integer type, call identification number. Range from 0 to 17. (only for Exit dormancy action)
AT#CDORM?	The read command returns the current settings and status. **#CDORM:<unsolicited_status>[,<call_id>,<dormant_status>][<CR><LF>** **#CDORM:<unsolicited_status>,<call_id>,<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 **<call_id>**
Reference	

3.5.1.1.2 *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>** saved in NVM.
AT#NWEN?	Read command reports whether URC of network emergency number update is currently enabled or not:

#NWEN - Network Emergency Number Update	
	#NWEN: <en>
AT#NWEN=?	Test command returns supported values of parameter **<en>**

3.5.1.1.3 *Delete All Phonebook Entries - #CPBD*

#CPBD - Delete All Phonebook Entries	
AT#CPBD	Execution command deletes all phonebook entries in the current phonebook memor y 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.

3.5.1.1.4 *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>** - representing a type of call tones which the command refers to 0 – Not disable call tones 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>**

3.5.1.1.5 *SIM Presence Status - #SIMPR*

#SIMPR – SIM Presence Status	
AT#SIMPR= **[<mode>]**	Set command enables/disables the Query SIM Presence Status unsolicited indication in the ME. This command reports also the status of the remote SIM, if the SAP functionality has been enabled by the AT#RSEN command (AT#RSEN=1). **Parameter:** **<mode>** - type of notification 0 - disabled (factory default); it's possible only to query the current SIM status through Read command AT#SIMPR? 1 - enabled; the ME informs at every (local and remote) SIM status change through the following unsolicited indication: #SIMPR: <SIM>,<status>

#SIMPR – SIM Presence 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 SIM status, in the format: **#SIMPR: <mode>,0,<status>[<CR><LF>** **#SIMPR: <mode>,1,<status>]** (**<mode>**, **<SIM>** and **<status>** are described above)
AT#SIMPR=?	Test command returns the supported range of values for parameter **<mode>**.
Example	AT#SIMPR? #SIMPR: 0,0,1 #SIMPR: 0,1,1 OK

3.5.1.1.6 *New Operator Names - #PLMNMODE*

#PLMNMODE – Apply to New Operator Names	
AT#PLMNMODE=<mode>	Set command apply's to new operator names depending on the parameter <mode>. Parameter: <mode> 0 – previous operator names 1 – new operator names Default Value is 1. **Note**: if <mode>=1, AT+COPN command shows new operator names. **Note**: <mode> is saved in NVM. **Note**: When #ENS value is 1 #PLMNMODE value will always be 1 after reboot. (See #ENS for more details).
AT#PLMNMODE?	Read command returns current value of the parameter <mode>.
AT#PLMNMODE=?	Test command returns supported values of the parameter <mode>.

3.5.1.1.7 *Blind G2L redirection after CSFB - #BRCSFB*

#BRCSFB – Blind G2L redirection after CSFB	
AT#BRCSFB=<par>	This command enables/disables blind GSM to LTE redirection after CS fallback Parameters: **<par>:**

#BRCSFB – Blind G2L redirection after CSFB	
	0 – Disable blind G2L redirection after CSFB (default value) 1 – Enable blind G2L redirection after CSFB Note1: Value saved in NVM. Note2: Requires reboot after set command.
AT#BRCSFB?	The read command reports current state of blind G2L redirection after CSFB **#BRCSFB: <state>** Where **<state> -** current state of blind G2L redirection after CSFB
AT#BRCSFB=?	Test command reports the supported range of values for parameter **<par>**. **#BRCSFB: (0,1)**

3.5.1.1.8 *Supplementary service domain preference - #SDOMAIN*

#SDOMAIN – supplementary service domain preference	
AT# SDOMAIN = [< Sdomain >], [< USdomain >]	Set command allows to selects service domain preference. **Parameters:** < Sdomain > - supplementary service domain preference 0 – Domain preference is auto 1 - Domain preference is CS only 2 - Domain preference is PS only 3 - Domain preference is PS preferred. [< USdomain > Unstructured supplementary service domain preference 0 – Domain preference is CS only 1 - Domain preference is IMS preferred **Important note:** Need to power cycle the unit for the setting to take effect. **Note:** the mode is saved into the NVM
AT#SDOMAIN?	Read command returns the current value of parameters
AT#SDOMAIN =?	Test command returns all supported values of the parameters **Example:** at#sdomain=? #SDOMAIN: (0-3),(0,1) OK

3.5.1.1.9 *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 5-3600 - 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	This command is not supported in UC864-G AT&T. 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)

3.5.2 AT Run Commands

3.5.2.1.1 *Enable SMS AT Run service - #SMSATRUN*

#SMSATRUN – Enable SMS AT Run service	
AT#SMSATRUN=	Set command enables/disables the SMS AT RUN service.

<mod>	**Parameter:** **<mod>** 0 - Service Disabled 1 - Service Enabled **Note1**: When the service is active on a specific AT instance (see AT#SMSATRUNCFG), that instance cannot be used for any other scope except for OTA service that has the highest priority. **Note2**: the current settings are stored in NVM
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.

3.5.2.1.2 *Set SMS AT Run 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. 1 – UART 2 – USB1 3 – USB2 **<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. **<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:** the instance used for the SMS AT RUN service is the same used for the EvMoni service. Therefore, 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

3.5.2.1.3 *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 Passwords 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 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>

3.5.2.1.4 *Set TCP AT Run Service Parameters - #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. Command. Range 1 - 3, default 2. 1 – UART 2 – USB1 3 – USB2 **<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 parameter is mandatory. Default "". **<urcmod>** 0 – disable unsolicited messages 1 - enable an unsolicited 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 – (default) 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. 1 – when connection is up, the user receives a request for username and, if username is correct, a request for password. Then the message ”Login successfull” will close authentication phase. **Note 1:** if username and/or password are not allowed (see AT#TCPATRUNAUTH) the connection will close immediately. **<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. **<retryDelay>** In client mode, delay between one attempt and the other. In minutes. Default: 2. Range 1…3600. **Note 2:** the current settings are stored in NVM. **Note 3:** 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 4:** 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

3.5.2.1.5 *Enables TCP AT Run 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 1:** If SMSATRUN is active on the same instance (see AT#TCPATRUNCFG) the command will return ERROR. **Note 2:** when the service is active it is on a specific AT instance (see AT#TCPATRUNCFG), that instance cannot be used for any other scope. **Note 3:** the current settings are stored in NVM. **Note 4:** to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see AT#SGACTCFG command).
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 1 - in listen or active
AT#TCPATRUNL=?	Test command returns the supported values for the TCPATRUNL parameters

3.5.2.1.6 *TCP AT Run Firewall List - #TCPATRUNFRWL*

#TCPATRUNFRWL – TCP AT Run Firewall List	
AT#TCPATRUNFRWL= <action>, <ip_addr>,	Set command controls the internal firewall settings for the TCPATRUN connection. **Parameters:**

<net_mask>	**<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. 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 a criterion is matched, then the packet is accepted and the rule scan is finished; if a criterion is not matched for any chain the packet is silently dropped. **Note 1:** A maximum of 5 firewalls can be present at same time in the List. **Note 2**: the firewall list is saved in NVM
AT#TCPATRUNFRWL?	Read command reports the list of all ACCEPT chain rules registered in the Firewall settings in the format: **#TCPATRUNFRWL:** <ip_addr>,<net_mask> **#TCPATRUNFRWL:** <ip_addr>,<net_mask> … OK <stat> - connection status 0 – not in listen 1 - in listen or active
AT#TCPATRUNFRWL=?	Test command returns the allowed values for parameter <action>.

3.5.2.1.7 *TCP AT Run Authentication Parameters List - #TCPATRUNAUTH*

#TCPATRUNAUTH – TCP AT Run Authentication Parameters List	
AT#TCPATRUNAUTH = <action>, <userid>,	Execution command controls the authentication parameters for the TCPATRUN connection.

<passw>	**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 1:** A maximum of 3 entries (password and userid) can be present at same time in the List. **Note 2:** the Authentication Parameters List is saved in NVM.
AT#TCPATRUNAUTH?	Read command reports the list of all ACCEPT chain rules registered in the Authentication settings in the format: **#TCPATRUNAUTH:** <user_id>,<passw> **#TCPATRUNAUTH:** <user_id>,<passw> …. OK
AT#TCPATRUNAUTH=?	Test command returns the allowed values for parameter <action>.

3.5.2.1.8 *Enables TCP Run AT Service in dial (client) mode - #TCPATRUND*

#TCPATRUND – Enables TCP Run AT 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). **Parameter:** **<mod>** 0 - Service Disabled 1 - Service Enabled **Note 1:** If SMSATRUN is active on the same instance (see AT#TCPATRUNCFG) the command will return ERROR. **Note 2:** when the service is active it is on a specific AT instance (see AT#TCPATRUNCFG), that instance cannot be used for any other scope.

	Note 3: the current setting are stored in NVM **Note 4:** to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see AT#SGACTCFG command). Note5: 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.
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

3.5.2.1.9 *Closes 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

3.5.2.1.10 *For TCP Run AT Service, allows the user to give AT commands in sequence - #TCPATCMDSEQ*

#TCPATCMDSEQ – For TCP Run AT Service, allows the user to give AT commands in sequence	
AT#TCPATCMDSEQ=<mod>	Set command enable/disable, 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 message body text (e.g. “at+cmgs”, “at#semail”) **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

3.5.2.1.11 *Connects the 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 serial port specified. Data will be transferred directly, without being elaborated, between the TCP Run AT service and the serial port specified. Parameter: **< port >** • 0 – UART • 1 – USB1 • 2 – USB2 **< rate >** baud rate for data transfer. Allowed values are 300,1200, 2400,4800,9600,19200,38400,57600,115200. Note1: the command has to be issued from the TCP ATRUN instance Note2: 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. Note3: To exit from online mode and close the connection, the escape sequence (+++) has to be sent on the TCP ATRUN instance
AT#TCPATCONSER=?	Test command returns the supported values for the TCPATCONSER parameters.

3.5.2.1.12 *Set the delay on Run AT command execution - #ATRUNDELAY*

#ATRUNDELAY – Set the delay on Run AT command execution	
AT#ATRUNDELAY=<srv>,<delay>	Set command enables the use of a delay before the execution of AT command received by Run AT service (TCP and SMS). It affects just AT commands given through Run AT service. **<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). **Note 1:** The use of the delay is recommended to execute some AT commands that require network interaction or switch between GSM and GPRS services. For more details see the RUN AT User Guide. **Note 2:** The delay is valid till a new AT#ATRUNDELAY is set.
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

3.6 Event Monitor Commands

3.6.1.1.1 *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.
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 **ENAE VMONI** parameters

3.6.1.1.2 *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) Note: In Qualcomm platform, <**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+CGMRI+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

3.6.1.1.3 *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 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 **<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: • 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 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 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>]]]** 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

3.6.1.1.4 *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. - 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. The command maximum length is 560 including the AT command itself. For example: AT#CMGS="1234567","SMS text" the length is 26.
Reference	GSM 27.005

3.6.1.1.5 *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) **AT#CMGW=<da> ,<text>**	**(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**). **<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 - Write Message To Memory	
	#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	GSM 27.005
Note	To avoid malfunctions is suggested to wait for the #**CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands. The command maximum length is 560 including the AT command itself. For example: AT#CMGW="1234567","SMS text" the length is 26.

3.7 Emergency Call and ECall Management

3.7.1.1.1 *IVS push mode activation - #MSDPUSH*

#MSDPUSH – IVS push mode activation	
AT#MSDPUSH	Execution command enables IVS to issue the request for MSD transmission. It reuses downlink signal format to send a initiation message to the PSAP.
AT#MSDPUSH=?	Test command returns the OK result code.

3.7.1.1.2 *Sending MSD data to IVS - #MSDSEND*

#MSDSEND – Sending MSD data to IVS	
AT#MSDSEND	Execution command allows to send 140 bytes of MSD data to the IVS embedded while modem is in command mode. The device responds to the command with the prompt '>' and waits for the MSD to send. To complete the operation send **Ctrl-Z** char (**0x12A** 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 140; trying to send more data will cause the surplus to be discarded and lost.
AT#MSDSEND=?	Test command returns the **OK** result code

3.7.1.1.3 *Initiate eCall - +CECALL*

+CECALL – Initiate eCall	
AT+CECALL=<type of eCall>	Set command is used to trigger an eCall to the network. Based on the configuration selected, it can be used to either trigger a test call, a reconfiguration call, a manually initiated call or an automatically initiated call. **Parameters:** **<type of eCall>:** 0 – test call 1 – reconfiguration call 2 – manually initiated eCall 3 – automatically initiated eCall
AT+CECALL?	Read command returns the type of eCall that is currently in progress in the format: +CECALL: [<type of eCall>]
AT+CECALL=?	Test command reports the supported range of values for parameter <type of eCall>.

3.7.1.1.4 *Embedded IVS inband modem enabling - #ECALL*

#ECALL – Embedded IVS inband modem enabling	
AT#ECALL=<mode>	Set command enables/disables the embedded IVS modem. **Parameters:** **<mode>:** 0 – disable IVS (default) 1 – enables IVS **Note:** the sending of a MSD is pointed out with an unsolicited message through AT interface that can report the HL-ACK data bits or an error code in the following format: **#ECALLEV:** <prim>,<data> **<prim>:** 0 – Pull-IND 1 – Data_CNF

#ECALL – Embedded IVS inband modem enabling	
	2 – AL-Ack 16 – sync loss **<data>:** Data content of Application Layer message (only with AL-Ack) **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. **Note:** When IVS modem is enabled PCM playing, PCM recording and DTMF decoding are automatically disabled (AT#SPCM or AT#DTMF will return error). **Note:** +CECALL command supersedes this command because it enables automatically eCall functionality.
AT#ECALL?	Read command reports the currently selected <prim> in the format: **#ECALL:** <mode> **<mode>:** 0 – IVS disabled 1 – IVS enabled
AT#ECALL=?	Test command reports supported range of values for all parameters.

3.7.1.1.5 *Determine Encoding Rule - #ECALLTYPE*

#ECALLTYPE – Determine encoding rule	
AT#ECALLTYPE= <rule>	Set method to encode MSD data Parameters: **<rule>:** 0 – Qaulcomm encoding rule. 1 – Unified AT command rule(Default). 2 – ASN.1 Packed encoding rule (PER unaligned). Note: the main difference of **<rule>** is which rule make codified MSD. if **<rule>** is set to 1, need to set codified MSD via **#MSDSEND** command before sending MSD to PSAP. if set to 0 or 2, need to set the parameters of MSD via **#MSDVI** and #**MSDGI** commands before sending MSD to PSAP.

	Note: when **<rule>** set to 0, data present of MSD is encoded with Qualcomm own method Note: when **<rule>** set to 1, MSD data uses data received to **#MSDSEND** Note: the below table indicate to applicable AT command following each selected value of **< rule >** AT Command / #ECALLTYPE=1 / # ECALLTYPE =0 or 2 **+CECALL** / O / O **#TESTNUM** / O / O **#MSDSEND** / O / X **#MSDPUSH** / O / X **#MSDVI** / X / O **#MSDGI** / X / O Note: #ECALLTYPE=0,2 isn't possible to redo a PUSH by the application. Note: The setting is saved in NVM and available on following reboot.
AT#ECALLTYPE?	Read command reports the current values of parameter <rule>.
AT#ECALLTYPE=?	Test command reports the supported range of values for parameter <rule>.

3.7.1.1.6

MSD of Vehicle Information - #MSDVI

#MSDVI – MSD of Vehicle Information	
AT#MSDVI= <type>, <VIN>, <storage type>, [<Nb of passengers>]	This command sets the contents of MSD which is related vehicle information stored on EF system. **Parameters:** **<type>-** indicates the type of vehicle 1 – passenger vehicle (class M1) 2 – buses and coaches (class M2) 3 – buses and coaches (class M3) 4 – light commercial vehicles (class N1) 5 – heavy duty vehicles (class N2) 6 – heavy duty vehicles (class N3) 7 – motorcycles (class L1e) 9 – motorcycles (class L1e) 10 – motorcycles (class L1e) 11 – motorcycles (class L1e) 12 – motorcycles (class L1e) 13 – motorcycles (class L1e)

#MSDVI – MSD of Vehicle Information	
	<VIN>- string type; vehicle Identification number according to ISO 3779 **<storage type>-** sum of integer each representing the vehicle propulsion storage type 1 – gasoline tank 2 – diesel tank 4 – compressed natural gas (CNG) 8 – liquid propane gas (LPG) 16 – electric energy storage (with more than 42V and 100Ah) 32 – hydrogen storage **<Nb of passenger>-** Minimum known number of fastened seatbelts 1..254 – number of passenger 255 – no information available **Note: #MSDVI** is applicable only if the current selected eCall mode (see **#ECALLTYPE**) is set to 0 or 2 **Note:** The setting is saved in NVM .
AT#MSDVI?	Read command reports the values of vehicle information which is stored on NVM in the format: **#MSDVI:** <type>,<VIN>,<storage type>,<Nb of passengers>
AT#MSDVI=?	Test command returns the allowed values for parameters

3.7.1.1.7 *MSD of GPS Information and Vehicle - #MSDGI*

#MSDGI – MSD of GPS and Vehicle Information	
AT#MSDGI =<GPS mode>,<message identifier>,<confidence>,<passengers>,<time stamp>, <current latitude>,<current longitude>,<current direction>[,<recent latitude n- 1>,<recent longitude n-1>[,<recent atitude n-2>,<recent longitude n-2>]]	This command sets the contents of MSD which is related vehicle incident information such as GPS information, number of passenger and so on, stored on EF system. **Parameters:** **<GPS mode>** - GPS mode number of fastened seatbelts 0 – use embedded GPS data 1 – use external GPS data which is stored on EF system **<message identifier>** - Message identifier, starting with 1 for each new eCall session and to be incremented with every application layer MSD retransmission following a new 'Send MSD' request after the incident event Range is 1..255

#MSDGI – MSD of GPS and Vehicle Information	
	<confidence> - The position confidence should be set to "Low confidence in position" if the positlon is not within the limits of ± 150 m with 95 % confidence. 0 – low confidence in position 1 – Position can be trusted **<passengers>** - Minimum known number of fastened seatbelts 0..254 – number of passenger 255 – no information available **Note:** followed parameters <time stamp>, <current latitude>, <current longitude>, <current direction>, <recent latitude n-1>, <recent longitude n-1>, <recent latitude n-2> and <recent longitude n-2> applicable only for <GPS mode> is set to 1 otherwise used internal embedded GPS data. In case of <GPS mode> is set to 1, must be populated with the external GPS data, and used as time stamp and gps position for MSD contents. In case of <GPS mode> is set to 0, populated with a default time stamp and gps position to be used in case of no gps fix. **<time stamp>** - integer of timestamp of incident event base on UTC sec. As seconds elapsed since midnight Jan. 1st, 1970 UTC **<current latitude>** - position latitude of current vehicle location (WGS84). range is "-324000000 to 324000000" **<current longitude>** - position longitude of current vehicle location(WGS84). range is "-648000000 to 648000000" **<current direction>** - Direction of travel in 2° degrees steps from magnetic north (0 – 358, clockwise) **<recent latitude n-1>** - latitude delta (+ for North and – for South) with respect to <current latitude>. range is "-512 to 511" **<recent longitude n-1>** - longitude delta (+ for East and – for West) with respect to <current longitude>. range is "-512 to 511" **<recent latitude n-2>** - latitude delta (+ for North and – for South) with respect to <recent latitude n-1>. range is "-512 to 511" **<recent longitude n-2>** - longitude delta (+ for East and – for West) with respect to <recent longitude n-1>. range is "-512 to 511" **Note:** if time stamp is set to "0" it's means failure value of time stamp. **Note:** the unit of latitude delta and longitude delta is 1 Unit = 100 milli-arcseconds (WGS84) which is approximately 3m. **Note:** #MSDGI is applicable only if the current selected eCall mode (see #ECALLTYPE) is set to 0. **Note:** When use internal GPS, should set a default time stamp and gps position to be used in case of no gps fix. **Note:** if GPS Mode is changed 0 to 1 or 1 to 0, should reboot module.

#MSDGI – MSD of GPS and Vehicle Information	
AT#MSDGI?	Read command reports the values of GPS information which is stored on EF in the format: **#MSDGI:** <GPS mode >,<message identifier>,<confidence>,<Nb of passengers>,<time stamp>,<current latitude>,<current longitude>,<current direction>,<recent latitude n-1>,<recent longitude n-1>,<recent latitude n-2>,<recent longitude n-2>
AT#MSDGI=?	Test command returns the allowed values for parameters

3.7.1.1.8 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 (if eCall is supported – Rel8 feature) 64 - Automatically Initiated eCall (if eCall is supported– Rel8 feature) When the emergency call can initiate, an indication of the Service Categories selected is shown before the OK in the following format: #EMRGD: <serv>[,<serv>..[,<serv]] **Where:** **<serv>** “Police “Ambul” “FireBrig” “MarineGuard” “MountRescue” “MIeC” “AIeC” **Example:**

#EMRGD – dial an emergency call	
	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: <numn>[,<parn>,<serv>[,<serv>..[,<serv]]]] **Where:** **<numn>** Is the emergency number (that can be dialed with ATD command). **<parn>** 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 (if eCall is supported – Rel8 feature) 64 - Automatically Initiated eCall (if eCall is supported– Rel8 feature) 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>. If eCall is supported: 0-32,64 If eCall is not supported: 0-31

3.7.1.1.9 *#MSDREAD – Read current MSD*

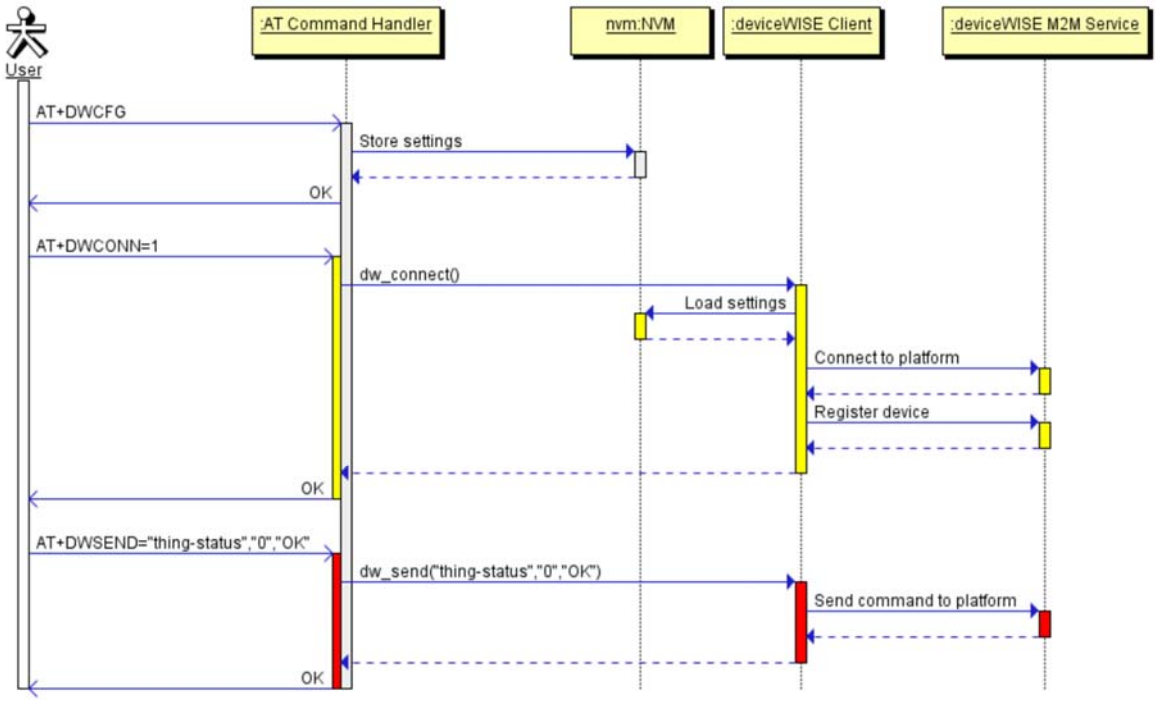
AT#MSDREAD?	This command returns the last MSD set by #MSDSEND or #MSDGI,MSDI
Example	AT#ECALLTYPE=0 OK

	AT#MSDGI=1,1,0,255,1413498935,135567828,460687500,12,12,12, 12,12 OK AT#MSDVI=1,WMWVDSVDSYA654321,1,255,1,1 OK AT#MSDREAD #MSDREAD: 01040701D55D70D65C3597CA1851030814154404837881499D49B 75888C0CFF000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 0000 OK AT#ECALLTYPE=1 OK AT#MSDSEND >011C0601D55D70D65C3597CA1851030814154404837881499D49 B75888C0C8320C8320CFF000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 000000 OK AT#MSDREAD? #MSDREAD: 011C0601D55D70D65C3597CA1851030814154404837881499D49 B75888C0C8320C8320CFF000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 000000 OK AT#ECALLTYPE=2 OK AT#MSDGI=1,1,0,255,1413498935,135567828,460687500,12,12,12, 12,12 OK AT#MSDVI=1,WMWVDSVDSYA654321,1,255,1,1

	OK AT#MSDREAD? #MSDREAD: 011C0601D55D70D65C3597CA1851030814154404837881499D49 B75888C0C8320C8320CFF00000000000000000000000000000000 00000000000000000000000000000000000000000000000000000000 00000000000000000000000000 OK

3.8 Iot Platform Commands

The following AT commands Regard the deviceWISE functionality
Here is a basic interaction diagram:



3.8.1.1.1 *Configure deviceWISE parameters - #DWCFG*

#DWCFG –configure deviceWISE parameters	
AT#DWCFG=[<serverUrl>[,<deviceIDSelector>[,<appToken>[,<security>[,<heartBeat>[,<autoReconnect>[,<overflowHandling>[,<atrunInstanceId>[,<serviceTimeout>[,<contextID>[,<unused_2>[,<unused_3>]]]]]]]]]]]]	This command sets the parameters related to the deviceWISE functionality Parameters: **<serverUrl>** - String parameter indicating the URL of the M2M Service instance in address:port form. **<deviceIDSelector>** 0 – 1 (0=IMEI 1=CCID/ESN), basically 0 if not SIM card or CDMA ID installed **<appToken>** - The secure application token provided in the Management Portal, typically a string of 16 characters.. **<security>** - Flag indicating if the SSL encryption is enabled. 0 – SSL encryption disabled (default) 1 – SSL encryption enabled If SSL encryption enabling is required, some initial settings have to be done as follows. For further details, refer to “SSL/TLS User Guide”. SSL channel has to be enabled as follows: AT#SSLEN=1,1 OK If server authentication is needed, **#SSLSECCFG** has to be set as follows:

#DWCFG –configure deviceWISE parameters	
	AT#SSLSECCFG=1,0,1,0 OK Then, CA Certificate(DER format) has to be stored as follows: AT#SSLSECDATA=1,1,1,<size> > ……. // store CA Certificate OK Note: Only the configuration SSL commands listed above are admitted. DW connection in secure mode cannot be used contemporarily to any command starting an SSL connection (including SSL sockets, FTPS, secure SMTP and HTPS). **<heartBeat>** - If no packets are received in the number of seconds specified in the heartbeat field, a heartbeat message will be sent to keep the connection alive. Default: 60 Range: 10 – 86400 **<autoReconnect>** - Flag indicating if the connection manager should automatically reconnect to the service. 0 – auto-reconnect disabled 1 – auto-reconnect lazy - reconnect on next send and every 3600 seconds. 2 – auto-reconnect moderate (default) - reconnect 120 seconds, then every 3600 seconds after the first day. 3 – auto-reconnect aggressive - reconnect every 120 seconds. **<overflowHandling>** - Flag indicating if the way to handle overflows in data management. 0 – FIFO (default) 1 – LIFO **<atrunInstanceId>** - AT instance that will be used by the service to run the AT Command. Default 2 Range 0 – 4 Note: This parm is not in use just for backward capability **<serviceTimeout>** - It defines in seconds the maximum time interval for a service request to the server. Default 5 Range 1 – 120 **<contextID>** - PDP context identifier (see +CGDCONT command) 1..5 - numeric parameter which specifies a particular PDP context definition Default 1 Note: For Verizon default 3
AT# DWCFG?	Read command returns the current settings in the format: **#DWCFG:** **<serverUrl>,<deviceIDSelector>,<appToken>,<security>,<heartBeat>,<autoReconnect>,<overflowHandling>,<atrunInstanceId>,<serviceTimeout>,0,0,0**
AT#DWCFG=?	Test command returns the supported range of parameters **<deviceIDSelector>,**

#DWCFG –configure deviceWISE parameters	
	<security>, <heartBeat>, <AutoReconnect>,<overflowHandling>,<atrunInstanceId> and **<serviceTimeout>** and the maximum length of **<serverUrl> and <appToken>** parameters.

3.8.1.1.2 *Connect to M2M Service - #DWCONN*

#DWCONN – connect to M2M Service	
AT#DWCONN=<connect>	Set command connects/disconnects to the M2M Service. Parameters: **<connect>** - flag to connect/disconnect to the M2M Service 0 – disconnect (default) 1 – connect Note: **AT#DWCONN=1** performs the socket connection and the MQTT connection. **AT#DWCONN=0** performs the socket disconnection. Note: the PDP Context used for the network connection is the first (**<cid>**=1 has to be previously defined with **AT+CGDCONT** command and activated with **AT#SGACT** command) Note: if the secure mode connection has been enabled, it cannot be used contemporarily to any command starting an SSL connection (including SSL sockets, FTPS, secure SMTP and HTPS).
AT#DWCONN?	Read command returns the current settings for all parameters in the format: **#DWCONN: <connect>>,<status>** Where: **<connect>** is defined as above **<status>** is the real connection status. Values: 0 = disconnected 1 = trying to connect 2 = connected 3 = waiting to connect
AT#DWCONN=?	Test command reports the supported range of values for all parameters

3.8.1.1.3 *Query connection status - #DWSTATUS*

#DWSTATUS– Query connection status	
AT#DWSTATUS	Execution command returns the status of the connection, including some runtime statistics. Note, all statistics should be stored in RAM, not NVM. The Cloud will return a generic structure **#DWSTATUS:** **<connected><lastErrorCode>,<latency>,<pktsIn>,<pktsOut>,<bytesIn>,<bytesOut>** **<connected>** : 3 = waiting to connect, 2 = connected, 1 = trying to connect, 0 = disconnected **<lastErrorCode**>: last error code encountered by the client

#DWSTATUS– Query connection status	
	<latency> : milliseconds measured between last request and reply. **<pktsIn> :** number of packets received, tracked by the server **<pktsOut> :** number of packets sent. **<bytesIn>** : number of bytes received, TCP/IP payload **<bytesOut>** : number of bytes sent.
AT#DWSTATUS=?	Test command reports **OK** result code

3.8.1.1.4 *Send data to M2M Service - #DWSEND*

#DWSEND – Send data to M2M Service	
AT#DWSEND=<type>,<param_>[,<param_2>[,…[<param_n>]]]	Execution command permits to send formatted data to the M2M Service. Parameters: **<type> -** type code for the type of message to send. (0 for normal request; 1 for method request; 2 for method update; 3 for method ack) **Type 0 message format:** **<param_i>** - string parameter indicating the i-th parameter, with i=1,…,24. **Type 1 message format:** **<param_1>** - "thingKey" – the key of a thing to execute. **<param_2>** - timeout – time to wait in seconds before returning an error for the request. **<param_3>** - method – the method key of a thing to execute. **<param_4>** - is singleton – 0 or 1. 1 if no more than one of these instances can exist. **<param_5+>** - parameters for the method. String parameter indicating the i-th parameter, with i=1,…,20. **Type 2 message format:** **<param_1> -** id – the identification of the method instance. **<param_2>** - message – a message represents the current status of the method. **Type 3 message format:** **<param_1> -** id – the identification of the method instance. **<param_2>** - status – the integer result status for the execution. 0 is reserved for OK. <**param_3 when status is set to non-zero**> - error message associated with the status. <**param_3 when status is set to zero**> - return parameters for the method. Key value pair should be used. **param_i** should be the name of the element and **param_i+1** should be the value of the element. Note: there is no limit on the length of the single **<param_i>**, but there is a limit in the total length of the AT command string, that cannot exceed 400 characters. If this threshold is exceeded, then an ERROR is raised. There is also a limit of 20 messages on the receive queue. If the queue is full, the consequent send will still succeed but the response for that particular request will be dropped until an item is removed from this queue (See command AT#DWRCV and AT#DWRCVR).

#DWSEND – Send data to M2M Service	
	Note: the response to the **AT#DWSEND** command reports the **<msgId>** value that identifies the sending. Note: 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 **AT#DWSEND** only if the connection has been opened with **AT#DWCONN**
AT#DWSEND=?	Test command reports the maximum length of **<type>** parameter.

3.8.1.1.5 *Send raw data to M2M Service - #DWSENDR*

#DWSENDR – Send data to M2M Service	
AT#DWSENDR=<dataLen>	Execution command permits to send raw data to the M2M Service. Content must be valid JSON. Parameters: **<dataLen>** - number of bytes to be sent Range: 1 - 1500 The module responds to the command with the prompt <greater_than><space> and waits for the data to send. When **<dataLen>** 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 response to the **AT#DWSENDR** command reports the **<msgId>** value that identifies the sending. There is also a limit of 20 messages on the receive queue. If the queue is full, the consequent send will still succeed but the response for that particular request will be dropped until an item is removed from this queue (See command AT#DWRCV and AT#DWRCVR). Note: it's possible to use **AT#DWSENDR** only if the connection has been opened with **AT#DWCONN**
AT#DWSENDR=?	Test command reports the supported range of values for **<dataLen>** parameter

3.8.1.1.6 *Receive data from M2M Service - #DWRCV*

#DWRCV – Receive data from M2M Service	
AT#DWRCV=<msgId>	Execution command permits the user to read formatted data arriving from M2M Service; the module is notified of these data by the URC **#DWRING**. Parameters: **<msgId>** - index of the data message to receive, as indicated in the URC **#DWRING**

#DWRCV – Receive data from M2M Service	
	Range: >=1 If the received data are the consequence of a previous data sending issued by **AT#DWSEND**, then the **<msgId>** value is the same of the **<msgId>** value reported in the answer of **AT#DWSEND**. The incoming Server data are notified by the URC **#DWRING** with the following format: **#DWRING: <type>,<msgId>,<len>** where: **<type> -** type of message to receive **<msgId>** - index of the data message to receive **<len>** - length of data message to receive If the incoming data are accepted with **AT#DWRCV**, then the formatted data are received and showed with the following URC: **#DWDATA:** **<msgId>,<error>,<len>,<param_1>[,<param_2>[,…[,<param_n>]]]** where: **<msgId>** - defined as above <**error**> - error code of the message to receive, 0 if there is no error. **<len>** - defined as above **<param_i>** - string parameter indicating the i-th parameter associated to the type specified Note: it is possible to use **AT#DWRCV** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error. If the data received are the consequence of a previous data sending issued by **AT#DWSEND**, then they can be read only using **AT#DWRCV** command and not **AT#DWRCVR** command (i.e.: **AT#DWRCV** and **AT#DWRCVR** are not interchangeable).
AT#DWRCV=?	Test command reports the supported range of values for all parameters.

3.8.1.1.7 *Receive raw data from M2M Service - #DWRCVR*

#DWRCVR – Receive raw data from M2M Service	
AT#DWRCVR=<msgId>	Execution command permits the user to read raw data arriving from M2M Service; the module is notified of these data by the URC **#DWRING**. Parameters: **<msgId>** - index of the data message to receive, as indicated in the URC **#DWRING** Range: >=1 If the data received are the consequence of a previous data sending (issued by **AT#DWSENDR**), then the **<msgId>** value is the same of the **<msgId>** value reported in the answer of **AT#DWSENDR**. The incoming Server data are notified by the URC **#DWRING** with the following format:

#DWRCVR – Receive raw data from M2M Service	
	#DWRING: <type>,<msgId>,<len> where: **<type>** - type of the data message to receive **<msgId>** - index of the data message to receive **<len>** - length of data message to receive If the incoming data are accepted with **AT#DWRCVR**, then the data are received and showed with the following URC: **#DWRDATA: <msgId>,<error>,<len>,<data>** where: **<msgId>** - defined as above **<error>** - error code of the message to receive, 0 if there is no error. **<len>** - defined as above **<data>** - M2M Service data Note: it is possible to use **AT#DWRCVR** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error. If the data received are the consequence of a previous data sending issued by **AT#DWSENDR**, then they can be read only using **AT#DWRCVR** command and not **AT#DWRCV** command (i.e.: **AT#DWRCV** and **AT#DWRCVR** are not interchangeable).
AT#DWRCVR=?	Test command reports the supported range of values for all parameters.

3.8.1.1.8 *List information on messages pending from M2M Service - #DWLRCV*

#DWLRCV – List information on messages pending from M2M Service	
AT#DWLRCV	Execution command permits the user to obtain information regarding the messages pending from M2M Service in the following format: **#DWLRCV:** **<msg_number>[,<msgId_1>,<msg_1_len>[,<msgId_2>,<msg_2_len>[,……<msgId_n>,<msg_n_len>]]]** where: **<msg_number>** - number of messages pending from M2M Service Range: >=0 **<msgId_i>** - index of the i-th data message to receive **<msg_i_len>** - length of the i-th data message to receive Note: it is possible to use **AT#DWLRCV** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error.
AT#DWLRCV=?	Test command reports **OK** result code

3.8.1.1.9 *Enable Agent Features - #DWEN*

#DWEN- Enable Agent Features	
AT#DWEN=<feat>,<en>[,<option1>[,<option2>[,<option3>[,<option4>[,<option5>]]]]]	Set command permits to enable/disable up to 8 different deviceWISE features. Parameters: **<feat>** - feature to enable or disable; range (0-7) 0 – remote at commands 1 … 7 – reserved for future use. **<en> - enable or disable the features** 0 – disable the feature 1 – enable the feature **<optionX>** where X=1,..,5 - optional parameters depending on the feature (string) Note: feature 0 (Remote AT commands) has no option. Note: the **<en>** value is considered only at the very first connection to M2M Service (**AT#DWCONN=1**) after a device power on or reboot
AT#DWEN?	Read command returns the current settings for each feature in the format: **#DWEN: <feat>,<en>,<option1>,<option2>,<option3>,<option4>,<option5>**
AT#DWEN=?	Test command reports the supported range of values for parameters **<feat>** and **<en>** and the maximum length of **<optionX>** (where X=1,..,5) parameters

3.9 OTA commands

3.9.1.1.1 *#OTAEN command*

#OTAEN – OTA Enable	
AT#OTAEN=[<enable>[,<discard>],[<automatic_dm_session>]]	Set command enables/disables OTA operations. Parameters: **<enable>** - numeric parameter which enables/disables the OTA operations 0 – disable 1 – enable (default) **<discard>** - numeric parameter which enables/disables the OTA SMS erasing. (Not supported by LE9x0). 0 – disable 1 – enable (default)

#OTAEN – OTA Enable	
	<automatic_dm_session> - enables to set the DM session as Automatic/Non-Automatic (i.e. Transparent/Non-Transparent). 0 - Non automatic DM session 1 - Automatic DM session (default) Note: the **<enable>** parameter setting is saved in NVM Note2: "Automatic DM Session" enables the network to contact and establish a secure connection with the modem without direct user interaction.
AT#OTAEN?	Read command reports the current settings of the OTA enable flag: **#OTAEN: <enable>,<discard>,<automatic_dm_session>**
AT#OTAEN =?	Test command returns values supported as a compound value
Example	AT#OTAEN=1,0,1 OK AT#OTAEN? #OTAEN: 1,0,1 OK AT#OTAEN=? #OTAEN: (0,1),(0,1),(0,1) OK

3.9.1.1.2 *OTAUIDM Command*

#OTAUIDM – OTA check and start update	
AT#OTAUIDM=[<ID>]	Execution command triggers the selected (per ID) provisioned DM clients for a user initiated session. Parameter **<ID>** 0 – VZW DM client 1 – (reserved) 2 – Telit SWM (FUMO client) 3 – (reserved) 4 – All provisioned clients

#OTAUIDM – OTA check and start update	
	NOTE: Each model is provisioned with different DM clients and hence the command will only work on the devices provisioned DM clients.
AT# OTAUIDM=?	Test command returns OK

3.9.1.1.3 *#OTASUAN command*

#OTASUAN – OTA Set User Answer	
AT#OTASUAN=[<response>][,<mode>[,<bfr>]]	Set command: a) Enables or disables sending of unsolicited result code #OTAEV that asks the TE to accept or reject the Management Server request to download a firmware b) Allows the TE to accept or reject the request Parameters: <response> - numeric parameter used to accept or reject the download request 0 – the request is rejected 1 – the request is accepted 2 – the request is delayed indefinitely: the URC is prompted indefinitely until the request is accepted or reject. Not supported by LE9x0. <mode> - numeric parameter that controls the processing of unsolicited result code #OTAEV 0 –buffer unsolicited result codes in the MT; if MT result code buffers is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 –discard unsolicited result codes when MT-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 MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE <bfr> - numeric parameter that controls the effect on buffered codes when <mode> 1 or 2 is entered 0 – MT buffer of unsolicited result codes #OTAEV is cleared when <mode> 1 or 2 is entered 1 – MT buffer of unsolicited result codes #OTAEV is flushed to TE when <mode> 1 or 2 is entered Note: the following unsolicited result codes and the corresponding events are defined: **Example of server initiated FOTA when using Non automatic DM session:**

#OTASUAN – OTA Set User Answer	
	at#otaen? #OTAEN: 1,1,0 OK **Success Case** **#OTAEV: #900** Do you want to start firmware update download? A management server request to start the firmware delta downloads. The user answer is expected. **at#otasuan=1** OK **#OTAEV: #907** Start Firmware Download. **#OTAEV: #921** <Total firmware size> Firmware size get from the OMA-DM server (byte) **#OTAEV: #920** <Percent Firmware Download> The progress bar of firmware downloads. **#OTAEV: #919** Firmware Download Complete. **#OTAEV: #DREL** Data session release. **After The Unit Reboot:** **#OTAEV: #000** Device is ready after power up **#OTAEV: #906** FUMO result report DM session start **#OTAEV: #924** FUMO result report DM session end **#OTAEV: #DREL** Data session release. **Fail Case**

#OTASUAN – OTA Set User Answer	
	#OTAEV: #900 Do you want to start firmware update download? A management server request to start the firmware delta downloads. The user answer is expected. **at#otasuan=1** OK **#OTAEV: #907** Start Firmware Download. **Errors:** **#OTAEV: #911** - credential error **#OTAEV: #912** - unreachable server **#OTAEV: #913** - network error **#OTAEV: #915** –update fails with other reasons **#OTAEV: #916** –done, No firmware update (Only in CI) **#OTAEV: #DREL** Data session release. Note: The User answer option is allowed only when #OTAEN AT command <enable> parameter is set to enable and <automatic_ dm_session> parameter is set to “Non automatic DM session”. In case the <automatic_ dm_session> parameter is set to “Automatic DM session” those unsolicited messages are for notification only.
AT# OTASUAN?	Read command reports the current settings in the format: **#OTASUAN: ,<mode>,<bfr>**
AT#OTASUAN =?	Test command returns values supported as a compound value
Example	AT#OTASUAN=,2,1 OK AT#OTASUAN? #OTASUAN: ,2,1 OK AT#OTASUAN =? #OTASUAN: (0-2),(0-2),(0,1) OK

3.9.1.1.4 *#OTACFG command*

#OTACFG - OTA PDP configuration	
AT#OTACFG=<ID>,<cid>	Set command allows changing the PDP context ID for each DM client **Parameters:** **<ID> -** The selected client ID: 0 – VZW DM client 1 – (reserved) 2 – Telit SWM (FUMO client) 3 – (reserved) 4 – All provisioned clients **<CID>** - The pdp context cid
at#otacfg=<ID>	Read command reports the currently configured pdp_cid for the given client ID. If -1 is returned, the cid for the requested client ID is not defined.
at#otacfg=?	Test command reports the supported range of values of the command parameters.
Example	at#otacfg=2 #OTACFG: 1 OK at#otacfg=0,2 #OTACFG: 2 OK

3.9.1.1.5 *#OTASS- Switches FOTA update server address to test or production*

#OTASS – Switches FOTA update server address to test or production	
AT#OTASS=<ID>,<mode>	Guides the FOTA to use test or production server for update for the given client ID. **Parameter:** **<ID>** 0 – VZW DM client 1 – (reserved) 2 – Telit SWM (FUMO client) 3 – (reserved) 4 – All provisioned clients **<mode>** 0 – Use test server 1 – Use production server

#OTASS – Switches FOTA update server address to test or production	
AT#OTASS=?	Test command reports the supported range of values of the command parameters.
At#otass=<ID>	Read command reports the currently configured server type for the given client ID. If -1 is returned, the server type for the requested client ID is not defined.
Example	**at#otass=2,1** **OK** **at#otass=2** **#OTASS: 1** **OK** **AT#OTASS=?** #OTASS:(0-4),(0-1) OK

3.9.1.1.6 ***Terminal Notifications***

Device Configuration

DC Process – Success Case		
Seq	**Terminal**	**Description**
1	**AT#OTAUIDM=0**	AT Command Check And Start Update (Only in CI)
2	**#OTAEV: #906**	Notification – DC DM Session Started
3	**#OTAEV: #918**	Notification – DC Done
4	**#OTAEV: #924**	Notification – Only If No Profile Was Updated in CI mode
5	**#OTAEV: #DREL**	Notification – Data session release

DC Process – Fail Case		
Seq	**Terminal**	**Description**
1	**AT#OTAUIDM=0**	AT Command Check And Start Update (Only in CI)
2	**#OTAEV: #906**	Notification – DC DM Session Started

3	**#OTAEV: <Error_Noti>**	Notification – Error happened One of the following notifications will be displayed: **#911** - credential error **#912** - unreachable server **#913** - network error **#915** - update fails with other reasons
4	**#OTAEV: #DREL**	Notification – Data session release

FUMO

FUMO Process – Success Case		
Seq	**Terminal**	**Description**
1	**AT#OTAUIDM=0**	AT Command Check And Start Update (Only in CI)
2	**#OTAEV: #907**	Notification – FUMO DM Session Started
3	**#OTAEV: #921 <fw_total_size>**	Notification – Firmware size get from the OMA-DM server (byte)
4	**#OTAEV: #920 <dl_progress>**	Notification – Firmware download progress (downloaded bytes)
5	**#OTAEV: #919**	Done, Firmware downloaded
6	**#OTAEV: #DREL**	Notification – Data session release

After update agent concludes device firmware update job, the device reports the update result to the OMADM server.

Seq	**Terminal**	**Description**
1	**#OTAEV: #000**	Notification – Device is ready after power up
2	**#OTAEV: #906**	Notification – FUMO result report DM session start

3	**#OTAEV: #924**	Notification – FUMO result report DM session end
4	**#OTAEV: #DREL**	Notification – Data session release

FUMO Process – Fail Case		
Seq	**Terminal**	**Description**
1	**AT#OTAUIDM=0**	AT Command Check And Start Update (Only in CI)
2	**#OTAEV: #907**	Notification – FUMO DM Session Started
3	**#OTAEV: <Error_Noti>**	Notification – Error happened while FUMO. One of the following notifications will Be displayed: **#911** - credential error **#912** - unreachable server **#913** - network error **#915** –update fails with other reasons **#916** –done, No firmware update (Only in CI)
4	**#OTAEV: #DREL**	Notification – Data session release

3.10 WLAN commands

3.10.1.1.1 *Enable/disable WLAN - #WLANSTART*

#WLANSTART – enable/disable WLAN	
AT#WLANSTART=[<mode>]	Set command enable/disable WLAN **Parameter:** **<mode>** - int type,status mode. 0 – disable 1 – enable 2 – auto enable with start **<cid>** - (PDP Context Identifier) numeric parameter which specifies a particular PDP context definition.

	Note: enable WLAN will start it as access point mode by default unless configure prior to start (at#wlanmode). Note: in case of starting WLAN with no network (no SIM card, +cfun=4, …) WLAN will start without internet access and it will return +CME ERROR: No Internet Access. Note: starting WLAN without <cid> parameter will start the WLAN with <cid>=1.
AT#WLANSTART?	Read command returns the currently WLAN status in the format: #WLANSTART: <mode> **Where:** **<mode>** 0 – WLAN off 1 – WLAN on 2 – WLAN on and auto start **<cid>** - PDP Context Identifier
AT#WLANSTART=?	Test command returns the supported range of values for parameter **<mode>** **<cid>**.

3.10.1.1.2 *Enable/disable broadcast - #WLANBROADCAST*

#WLANBROADCAST – enable/disable broadcast	
AT#WLANBROADCAST=[<mode>]	Set command enable/disable broadcast **Parameter:** **<mode>** - int type,status mode. 0 – enable broadcast 1 – disable broadcast
AT#WLANBROADCAST ?	Read command returns the currently broadcast status in the format: #WLANBROADCAST: <mode> **Where:** **<mode>** 0 – enable broadcast 1 – disable broadcast
AT#WLANBROADCAST =?	Test command returns the supported range of values for parameter **<mode>**.

3.10.1.1.3 *Change the SSID name - #WLANSSID*

#WLANSSID – change the SSID name	
AT#WLANSSID=[<ssid>]	Set command change the SSID name **Parameter:** **<ssid>** - string type**,**ssid.
AT#WLANSSID?	Read command returns the currently ssid in the format: #WLANSSID: <ssid>
AT#WLANSSID=?	Test command returns **OK** result code.

3.10.1.1.4 *Change WLANE mode - #WLANMODE*

#WLANMODE – change mode: access point/client	
AT#WLANMODE=[<mode>]	Set command change WLANE mode **Parameter:** **<mode>** - int type**,**status mode. 0 – Access pint mode 1 – Client mode
AT#WLANMODE?	Read command returns the currently mode status in the format: #WLANMODE: <mode> **Where:** **<mode>** 0 – Access pint mode 1 – Client mode
AT#WLANMODE=?	Test command returns the supported range of values for parameter **<mode>**.

3.10.1.1.5 *Return assigned IP address - # WLANIP*

#WLANIP – Return assigned ip address	
AT#WLANIP	Execute return the assigned ip address
AT#WLANIP=?	Test command returns OK

3.10.1.1.6 *Return signal strength of the network - # WLANSIGNAL*

#WLANSIGNAL – return the signal strength of the network we connected to	
AT#WLANSIGNAL	Execute return the signal strength of the network we connected to
AT# WLANSIGNAL =?	Test command returns OK

3.10.1.1.7 *Scanning wifi networks - #WLANSCAN*

#WLANSCAN – scan wifi network	
AT#WLANSCAN=[<mode>]	Set command for client mode only for scanning for wifi networks. **Parameter:** **<mode>** - int type, mode. 0 – normal result 1 – extend result
AT#WLANSCAN=?	Test command returns the supported range of values for parameter **<mode>**.

3.10.1.1.8 *Connect to SSID - #WLANCONNECT*

#WLANCONNECT – connect to ssid	
AT#WLANCONNECT=[[<ssid>],[<security>],[<key>]]	Set command for client mode only, to connect to a given SSID **Parameter:** **<ssid>** - string type**,** ssid. **<security> -** int type 0 – wep 1 – wpaX **<key>** - string type**,** key.
AT#WLANCONNECT?	Read command returns the currently ssid it connect to in the format: # **WLANCONNECT**: <ssid>
AT#WLANCONNECT=?	Test command reports supported values for the parameter < **type** >. **#WLANCONNECT:(0-1)**

3.10.1.1.9 *Disconnect from the network - #WLANDISCONNECT*

#WLANDISCONNECT – disconnect from ssid	
AT#WLANDISCONNECT	Execution command will disconnect from the network. Relevant for client mode only.
AT#WLANDISCONNECT=?	Test command returns **OK** result code.

3.10.1.1.10 *Use to add or change the hostapd.conf. - #WLANCONFIG*

#WLANCONFIG – use to add hostapd.conf file.	
AT#WLANCONFIG=[<size>]	Set command allows to add or change the hostapd.conf. Hostapd configuration file controls many options with regards to AP mode only, in which not all are supported by the current WIFI chip. **Parameter:**

	int type, size. **<size> -** file size
AT#WLANCONFIG=?	Test command returns **OK** result code.

3.10.1.1.11 *Use to changing wlan security parameters - #WLANSECURITY*

#WLANSECURITY – use to add hostapd.conf file.	
AT#WLANSECURITY=[[<wpa>],[<key_mgmt>,<pairwise>,<key>]]	Set command allows changing wlan security parameters. Relevant for AP mode only. **Parameter:** **<wpa> -** security type **0 – disable** **1 – wpa1** **2 – wpa2** **3 – wpa1 + wpa2** **<key_mgmt> -** security type **0 – WPA-PSK** **1 – WPA-EAP** **2 – WPA-EAP and WPA-PSK** **<pairwise> -** This controls wpa's data encryption **0 – TKIP** **1 – CCMP** **2 - TKIP and CCMP** **<key>** - string type, the network's password
AT#WLANSECURITY?	Read command reports the current value of the parameters
AT#WLANSECURITY=?	Test command returns the supported range of values for parameters **<wpa>,<key_mgmt>,<pairwise>,<key>** in the format: **#WLANSECURITY: (0-3),(0-2),""**

3.10.1.1.12 *Use to change the channel number and the wlan protocol- # WLANPC*

#WLANPC – use to change the channel number and the protocol.	
AT#WLANPC=<mode> ,<num>	Set command allow to change the AP channel number. Relevant for AP mode only. **Parameter:** **<mode> -** protocol type **0 – 'b'** **1 – 'g'** **2 – 'n' (2.4 GHz)** **3 – 'n' (5 GHz)** **4 – 'ac'** **<num>** - channel number NOTE: the channel can be selected automatically at run time by setting channel=0
AT# WLANPC ?	Read command returns the currently channel number and protocol in the format: #**WLANPC** : <mode> **,**<num> **Example:** at#wlanpc? #WLANPC: 1,12
AT#WLANPC=?	Test command returns the supported range of values for parameter **<mode>**.code.

3.10.1.1.13 *Display last error in detailed form. - #WLANCFGERROR*

#WLANCFGERROR – display hostapd.conf output error	
AT#WLANCFGERROR	Execution command will display last error in detailed form.
AT#WLANCFGERROR=?	Test command returns **OK** result code.

3.10.1.1.14 *Enable/disable MAC address filter- # WLANMACMODE*

#WLANMACMODE – enable/disable MAC address filtering	
AT# WLANMACMODE =<mode>	Set command allow to enable/disable the MAC address filter. Relevant for AP mode only. **Parameter:** **<mode> - int type** **0 = accept unless in deny list (default)** **1 = deny unless in accept list** **2 = use external RADIUS server (accept/deny lists are searched first)**
AT#WLANMACMODE ?	Read command returns the currently mode in the format: #**WLANMACMODE** : <num> **Example:** at#wlanmacmode? #WLANMACMODE: 1
AT#WLANMACMODE =?	Test command returns the supported range of values for parameter **<mode>**.

3.10.1.1.15 *Use to add/ remove MAC address to/from accept list - #WLANMACACCEPT*

#WLANMACACCEPT – use to add/ remove MAC address to/from accept list	
AT#WLANMACACCEPT=<mode>,<mac_address>	Set command allow to add/ remove MAC address to/from accept list. Relevant for AP mode only. **Parameter:** **<mode> -** int type **0 – remove from accept list** **1 – add to accept list** **< mac_address > -** string type**,** mac addres NOTE: mac address should be write with ':' between each Hexa number. Example 00:A0:C6:00:00:17
AT#WLANMACACCEPT?	Read command returns the accept list:
AT#WLANMACACCEPT =?	Test command returns the supported range of values for parameters

3.10.1.1.16 *Use to add/ remove MAC address to/from deny list - #WLANMACDENY*

#WLANMACDENY – use to add/ remove MAC address to/from deny list	
AT#WLANMACDENY=<mode>,<mac_address>	Set command allow to add/ remove MAC address to/from deny list. Relevant for AP mode only. **Parameter:** **<mode> -** int type **0 – remove from deny list** **1 – add to** deny **list** **< mac_address > -** string type**,** mac addres NOTE: mac address should be write with ':' between each Hexa number. Example 00:A0:C6:00:00:17
AT#WLANMACDENY ?	Read command returns the deny list:
AT#WLANMACDENY =?	Test command returns the supported range of values for parameters

3.10.1.1.17 *Use to set the regulatory domain - #WLANCOUNTRYCODE*

#WLANCOUNTYCODE– use to set the regulatory domain	
AT#WLANCOUNTRYCODE=<country_code >	Set command allow to change the country code. Relevant for AP mode only. **Parameter:** **<country_code> -** string type NOTE: This can limit available channels and transmit power. Default: US
AT#WLANCOUNTRYCODE ?	Read command returns the currently country code in the format: #WLANCOUNTRYCODE: <string> **Example:** at#wlancountrycode? #WLANCOUNTRYCODE: US OK
AT#WLANCOUNTRYCODE =?	Test command return OK

3.10.1.1.18 *Enable/disable WLAN unsolicited message - #WLANINDI*

#WLANINDI – enable/disable WLAN unsolicited message	
AT#WLANINDI=[<state>]	Set command enable/disable WLAN unsolicited message **Parameter:** **<state>** - int type,status mode. 0 – disable (factory default) 1 – enable Note: need to be save on profiles
AT#WLANINDI?	Read command returns the currently WLAN status in the format: #WLANINDI: <state> **Where:** **<state>** 0 – off 1 – on
AT#WLANINDI=?	Test command returns the supported range of values for parameter **<state>**.

3.11 AT parser abort

The following listed AT Commands can be aborted during execution:

ATD
ATA
+FRS
+FRH
+FRM
+CLCK
+CLCC
+COPN
+CPOL
+CLIP
+CLIR

NOTE: If DTE transmit any character before receiving the response to the issued AT Command, this causes current AT Command to be aborted.

4 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