LM940
AT Command Reference

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Telit

TELIT TECHNICAL DOCUMENTATION

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APPLICABILITY TABLE

PRODUCTS

- ■ ■ LM940

CONTENTS

1.   INTRODUCTION

1.1.   Scope

Scope of this document is to give an overview of the fonts, styles and general structure -- first chapter included -- to use when writing hardware user guides.

1.2.   Audience

This document is intended for editors who are about to write or edit documentation for Telit.

1.3.   Contact Information, Support

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

- TS-EMEA@telit.com
- TS-AMERICAS@telit.com
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For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

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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.   Text Conventions

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

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

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

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

1.5. Related Documents

- [1] 3GPP TS 27.007 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/

- [2] 3GPP TS 27.005 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/

- [3] Hayes standard AT command set

2. OVERVIEW

2.1. About the document

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

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

2.2.1. Attach/Detach procedure for packet domain services

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

2.2.2. EPS bearer context and PDP context

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

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

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

3.   AT COMMANDS

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

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.

2. 3GPP TS 27.007 specific AT command set for User Equipment.

3. 3GPP TS 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)

Moreover, Telit wireless module family supports also Telit proprietary AT commands for special purposes.

3.1.   Definitions

The following syntactical definitions apply:

- ***<CR> Carriage return character**, is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255,is specified within parameter **S3**. The default value is 13.*
- ***<LF> Linefeed character**, is the character recognized as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter **S4**. The default value is 10. The line feed character is output after carriage return character if verbose result codes are used (**V1** option used) otherwise, if numeric format result codes are used (**V0** option used) it will not appear in the result codes.*
- ***<...> **Name enclosed in angle brackets is a syntactical element. They do not appear in the command line.*
- ***[...]** Optional sub parameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When sub parameter is not given in AT commands which have a Read command, new value equals to its previous value. In AT commands which do not store the values of any of their sub parameters, and so have not a Read command, which are called action type commands, action should be done on the basis of the recommended default setting of the sub parameter.*

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

3.2. AT Command Syntax

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

- **Parameter type commands.** *This type of commands may be "set" (to store a value or values for later use), "read" (to determine the current value or values stored), or "tested" (to determine ranges of values supported). Each of them has a test command (trailing '=?') to give information about the type of its sub parameters; they also have a Read command (trailing '?') to check the current values of sub parameters.*
- **Action type commands.** *This type of command may be "executed" or "tested".*
  - o *"executed" to invoke a particular function of the equipment, which generally involves more than the simple storage of a value for later use*
  - o *"tested" to determine:*
    Whether or not the equipment implements the Action Command (in this case issuing the correspondent Test command - trailing =? - returns the OK result code), and, if sub parameters are associated with the action, the ranges of sub parameters values that are supported.

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

Moreover:

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

3.2.1. String Type Parameters

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

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

3.2.2. Command Lines

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

The **command line prefix** consists of the characters "**AT**" or "**at**", or, to repeat the execution of

the previous command line, the characters "**A/**" or "**a/**".

The **termination character** may be selected by a user option (parameter **S3**), the default being

<CR>.

The basic structures of the command line are:

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

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

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

anyway, it is always preferable to separate into different command lines the basic commands and the extended commands; furthermore, it is suggested to avoid placing several action commands in the same command line, because if one of them fails, then an error message is received but it is not possible to argue which one of them has failed the execution.

If command **V1** is enabled (verbose responses codes) and all commands in a command line has been performed successfully, result code **<CR><LF>OK<CR><LF>** is sent from the TA to the TE, if sub parameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code

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[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**

<CR><LF>ERROR<CR><LF> is sent and no subsequent commands in the command line are processed.

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

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

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

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

This is NOT a command, it is the error response to **+Cxxx 3gpp TS** 27.007 commands.

Syntax: **+CME ERROR: <err>**

Parameter: **<err>** - error code can be either numeric or verbose (see **+CMEE**). The possible values of **<err>** are reported in the table:

Numeric Format	Verbose Format
General errors:	
0	phone failure
1	No connection to phone
2	phone-adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service

Numeric Format	Verbose Format
31	network time-out
32	network not allowed - emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
General purpose error:	
100	unknown
601	wrong state
602	Can not activate
606	Bad or no response from server
608	Already connected
615	Service is not available
616	Invalid user id
617	Invalid password
618	File is not found
770	SIM invalid
GPRS related errors to a failure to perform an Attach:	
103	Illegal MS (#3)*
106	Illegal ME (#6)*
107	GPRS service not allowed (#7)*
111	PLMN not allowed (#11)*
112	Location area not allowed (#12)*
113	Roaming not allowed in this location area (#13)*
GPRS related errors to a failure to Activate a Context and others:	
132	service option not supported (#32)*
133	requested service option not subscribed (#33)*
134	service option temporarily out of order (#34)*

Numeric Format	Verbose Format
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
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)

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

This is NOT a command; it is the error response to +Cxxx 3gpp TS 27.005 commands

Syntax: **+CMS ERROR: <err>**

Parameter: **<err>** - numeric error code. The **<err>** values are reported in the table:

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

Numeric Format	Meaning
332	network time-out
340	no +CNMA acknowledgement expected
500	unknown error
512	FDN not allowed number

3.2.5.　　　Information Responses and Result Codes

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

- *Information response to **+CMD1?***
  <CR><LF>+CMD1:2,1,10<CR><LF>
- *Information response to **+CMD1=?***
  <CR><LF>+CMD1(0-2),(0,1),(0-15)<CR><LF>
- *Final result code*
  <CR><LF>OK<CR><LF>

Moreover, there are other two types of result codes:

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

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

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

3.2.6. Command Response Time-Out

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

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

("**AT+CREG?"** answer is **"+CREG: 0,1**" or **"+CREG: 0,5**").

Command	Estimated maximum time to get response (Seconds)
+COPS	180 (test command)
+CLCK	15 (SS operation) 5 (FDN enabling/disabling)
+CPWD	15 (SS operation) 5 (PIN modification)
+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
+CSCA	5 (read and set commands)

+CSAS	5
+CRES	5
+CMGS	120 after CTRL-Z; 1 to get '>' prompt
+CMSS	120
+CMGW	5 after CTRL-Z; 1 to get '>' prompt
+CMGD	5 (single SMS cancellation) 25 (cancellation of 50 SMS)
+CNMA	120 after CTRL-Z; 1 to get '>' prompt
+CMGR	5
+CMGL	100
+CGACT	150
+CGATT	140
D	120 (voice call) Timeout set with ATS7 (data call)
A	60 (voice call) Timeout set with ATS7 (data call)
H	60
+COPN	10
+CRSM	180
+COPL	180
+WS 46	10

3.2.7. Command Issuing Timing

The chain Command -> Response shall always be respected and a new command must not be issued before the module has terminated all the sending of its response result code (whatever it may be).

This applies especially to applications that "sense" the **OK** text and therefore may send the next command before the complete code **<CR><LF>OK<CR><LF>** is sent by the module.

It is advisable anyway to wait for at least 20ms between the end of the reception of the response and the issue of the next AT command.

If the response codes are disabled and therefore the module does not report any response to the command, then at least the 20ms pause time shall be respected.

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

3.3.   Storage

3.3.1.   Factory Profile and User Profiles

The Telit wireless modules stores the values set by several commands in the internal non-volatile memory (NVM), allowing to remember this setting even after power off. In the NVM these values are set either as **factory profile** or as **user profiles**: there are **two customizable user profiles** and **one factory profile** in the NVM of the device: by default the device will start with user profile 0 equal to factory profile.

For backward compatibility each profile is divided into two sections, one **base section** that was historically the one that was saved and restored in early releases of code, and the **extended section** that includes all the remaining values.

The **&W** command is used to save the actual values of **both sections** of profiles into the NVM user profile.

Commands **&Y** and **&P** are both used to set the profile to be loaded at start up. **&Y** instructs the device to load at start up only the **base section**. **&P** instructs the device to load at start up the full profile: **base + extended sections**.

The **&F** command resets to factory profile values only the command of the base section of profile, while the **&F1** resets to factory profile values the full set of base + extended section commands.

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

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

AUTOBAUD:	+IPR
COMMANDECHO:	E
RESULTMESSAGES:	Q
VERBOSEMESSAGES:	V
EXTENDEDMESSAGES:	X
FLOWCONTROLOPTIONS:	&K,+IFC
DSR(C107) OPTIONS:	&S
DTR(C108) OPTIONS:	&D
DCD (C109) OPTIONS:	&C
RI(C125) OPTIONS:	\R
POWERSAVING:	+CFUN
DEFAULTPROFILE:	&Y0
SREGISTERS:	S2;S3;S4;S5;S7;S12;S25;S30;S38
CHARACTERFORMAT:	+ICF

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

+DR	+CSCS	+CREG
+CNMI	+CIND	+CMER
+CPBS	+CMEE	+CGREG
+CMGF	+CSDH	+CEREG
#QSS	#SIMDET	#SIMPR
+CGEREP	+CTZU	+CTZR
+CSTF	+CSDF	+CSVM
+CPNER	#STIA	#NITZ

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

#SELINT	+COPS[3]	+CGCLASS
+CGDCONT	+CGQMIN	+CGQREQ
+CGEQMIN	+CGEQREQ	+WS46
+CGSMS	+CGEQOS	#ENS
#BND	#RXDIV	#VCDISABLE
#TESTMODE	#LRXDIV	#SIMNCFG
#HSEN	#CACTL	$LCSLPP
$AGPSEN	$CACTL	#RXTOGGLE
#ICMP		

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

+CSCA	+CSMP	+CSCB

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

$GPSP	$GPSR	$GPSNVRAM
$GPSQOS	$GPSSLSR	$GPSSTOP

Stored by $GPSSAV command and automatically restored at startup; factory default values are restored by $GPSRST command.

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[3] It is partially stored in NVM; see command description.
[4] Both commands +CSAS and +CRES deal with non-volatile memory, intending for it either the NVM and the SIM storage.

4. AVAILABILITY TABLE

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

4.1. Technology Availability Table

	GSM/GPRS	UMTS	LTE
LM940		●	●

4.2. AT Commands Availability Table

COMMAND	Generic (24.01.513)	Verizon (24.01.521)	Sprint (24.01.532)	AT&T (24.01.543)	Function
AT	●	●	●	●	Starting A Command Line
A/	●	●	●	●	Last Command Automatic Repetition Prefix
#/	●	●	●	●	Repeat Last Command
#SELINT	●	●	●	●	Select Interface Style
&F	●	●	●	●	Set To Factory-Defined Configuration
Z	●	●	●	●	Soft Reset
&Y	●	●	●	●	Designate A Default Reset Basic Profile
&P	●	●	●	●	Designate A Default Reset Full Profile
&W	●	●	●	●	Store Current Configuration
+GMI	●	●	●	●	Manufacturer Identification
+GMM	●	●	●	●	Model Identification
+GMR	●	●	●	●	Revision Identification
+GCAP	●	●	●	●	Capabilities List
+GSN	●	●	●	●	Serial Number
&V	●	●	●	●	Display Current Base Configuration And Profile
&V0	●	●	●	●	Display Current Configuration And Profile
&V1	●	●	●	●	S Registers Display
&V3	●	●	●	●	Extended S Registers Display

&V2	•	•	•	•	Display Last Connection Statistics
\V	•	•	•	•	Single Line Connect Message
+GCI	•	•	•	•	Country Of Installation
%L	•	•	•	•	Line Signal Level
%Q	•	•	•	•	Line Quality
L	•	•	•	•	Speaker Loudness
M	•	•	•	•	Speaker Mode
E	•	•	•	•	Command Echo
Q	•	•	•	•	Quiet Result Codes
V	•	•	•	•	Response Format
X	•	•	•	•	Extended Result Codes
I	•	•	•	•	Identification Information
&C	•	•	•	•	Data Carrier Detect (DCD) Control
&D	•	•	•	•	Data Terminal Ready (DTR) Control
&K	•	•	•	•	Flow Control
\Q	•	•	•	•	Standard Flow Control
&S	•	•	•	•	Data Set Ready (DSR) Control
\R	•	•	•	•	Ring (RI) Control
+IPR	•	•	•	•	Fixed DTE Interface Rate
+IFC	•	•	•	•	DTE-Modem Local Flow Control
+ICF	•	•	•	•	DTE-Modem Character Framing
D	•	•	•	•	Dial
A	•	•	•	•	Answer
H	•	•	•	•	Disconnect
%E	•	•	•	•	Line Quality Monitor And Auto Retrain Or Fallback/Fallforward
+DS	•	•	•	•	Data Compression
+DR	•	•	•	•	Data Compression Reporting
S2	•	•	•	•	Escape Character
S3	•	•	•	•	Command Line Termination Character
S4	•	•	•	•	Response Formatting Character

S5	•	•	•	•	Command Line Editing Character
S7	•	•	•	•	Connection Completion Time-Out
S10	•	•	•	•	Carrier Off With Firm Time
S12	•	•	•	•	Escape Prompt Delay
S25	•	•	•	•	Delay To DTR Off
S30	•	•	•	•	Disconnect Inactivity Timer
S38	•	•	•	•	Delay Before Forced Hang Up
+PACSP				•	Network Selection Menu Availability
+CGMI	•	•	•	•	Request Manufacturer Identification
+CGMM	•	•	•	•	Request Model Identification
+CGMR	•	•	•	•	Request Revision Identification
+CGSN	•	•	•	•	Request Product Serial Number Identification
+CSCS	•	•	•	•	Select TE Character Set
+CIMI	•	•	•	•	Request International Mobile Subscriber Identity (IMSI)
+ICCID	•	•	•	•	Read ICCID (Integrated Circuit Card Identification)
+CEER	•	•	•	•	Extended Error Report
+CNUM	•	•	•	•	Subscriber Number
+COPN	•	•	•	•	Read Operator Names
+CREG	•	•	•	•	Network Registration Report
+CEREG	•	•	•	•	EPS – Network Registration status
+COPS	•	•	•	•	Operator Selection
+WS46	•	•	•	•	PCCA STD-101 Select Wireless Network
+CLCK	•	•	•	•	Facility Lock/Unlock
+CPWD	•	•	•	•	Change Facility Password
+CPOL	•	•	•	•	Preferred Operator List
+CPLS	•	•	•	•	Selection of Preferred PLMN List
+CPAS	•	•	•	•	Phone Activity Status
+CFUN	•	•	•	•	Set Phone Functionality
+CPIN	•	•	•	•	Enter PIN

+CSQ	•	•	•	•	Signal Quality
+CIND	•	•	•	•	Indicator Control
+CMER	•	•	•	•	Mobile Equipment Event Reporting
+CPBS	•	•	•	•	Select Phonebook Memory Storage
+CPBR	•	•	•	•	Read Phonebook Entries
+CPBF	•	•	•	•	Find Phonebook Entries
+CPBW	•	•	•	•	Write Phonebook Entry
+CCLK	•	•	•	•	Clock Management
+CSDF	•	•	•	•	Time Zone reporting
+CSTF	•	•	•	•	Setting time format
+CTZR	•	•	•	•	Time Zone reporting
+CTZU	•	•	•	•	Automatic Time Zone update
+CRSM	•	•	•	•	Restricted SIM Access
+CSIM	•	•	•	•	Generic SIM Access
+CACM	•	•	•	•	Accumulated Call Meter
+CAMM	•	•	•	•	Accumulated Call Meter Maximum
+CPUC	•	•	•	•	Price Per Unit And Currency Table
+CCHO	•	•	•	•	Open Logical Channel
+CCHC	•	•	•	•	Close Logical Channel
+CGLA	•	•	•	•	Generic UICC Logical Channel access
+CUAD	•	•	•	•	UICC Application Discovery
+CPINR	•	•	•	•	Remaining PIN retries
+CSVM	•	•	•	•	Set voice mail number
+CLAC	•	•	•	•	Available AT commands
+CPNER	•	•	•	•	Primary Notification Event Reporting
+CMEE	•	•	•	•	Report Mobile Equipment Error
+CGCLASS	•			•	GPRS Mobile Station Class
+CGATT	•	•	•	•	PS Attach Or Detach
+CGEREP	•	•	•	•	Packet Domain Event Reporting
+CGREG	•	•	•	•	GPRS Network Registration Status

+CGDCONT	•	•	•	•	Define PDP Context
+CGQREQ	•	•	•	•	Quality Of Service Profile (Requested)
+CGEQREQ	•			•	3G Quality Of Service Profile (Requested)
+CGQMIN	•	•	•	•	Quality Of Service Profile (Minimum Acceptable)
+CGEQMIN	•			•	3G Quality Of Service Profile (Minimum Acceptable)
+CGACT	•	•	•	•	PDP Context Activate Or Deactivate
+CGEQNEG	•			•	3G Quality Of Service Profile (Negotiated)
+CEMODE	•	•	•	•	Set Mode of Operator for EPS
+CGPADDR	•	•	•	•	Show PDP Address
+CGCMOD	•	•	•	•	Modify PDP State
+CGCONTRDP	•	•	•	•	PDP Context Read Dynamic Parameters
+CGEQOS	•	•	•	•	Define EPS Quality of Service
+CGEQOSRDP	•	•	•	•	EPS Quality of Service Read Dynamic Parameters
+CGPIAF	•	•	•	•	Pinting IP Address Format
+CGTFTRDP	•	•	•	•	Traffic Flow Template Read Dynamic Parameters
+CBC	•	•	•	•	Battery Charge
+CSMS	•	•	•	•	Select Message Service
+CPMS	•	•	•	•	Preferred Message Storage
+CMGF	•	•	•	•	Message Format
+CSCA	•	•	•	•	Service Center Address
+CSMP	•	•	•	•	Set Text Mode Parameters
+CSDH	•	•	•	•	Show Text Mode Parameters
+CSCB	•	•	•	•	Select Cell Broadcast Message Types
+CSAS	•	•	•	•	Save Settings
+CRES	•	•	•	•	Restore Settings
+CMMS	•	•	•	•	More Messages to Send
+CNMI	•	•	•	•	New Message Indications To Terminal Equipment
+CNMA	•	•	•	•	New Message Acknowledgment to ME/TA

+CMGL	•	•	•	•	List Messages
+CMGR	•	•	•	•	Read Message
+CMGS	•	•	•	•	Send Message
+CMSS	•	•	•	•	Send Message From Storage
+CMGW	•	•	•	•	Write Message To Memory
+CMGD	•	•	•	•	Delete Message
+CGSMS	•	•	•	•	Select Service for MO SMS messages
+CESQ	•	•	•	•	Extended Signal Quality
#SHDN	•	•	•	•	Software Shut Down
#REBOOT	•	•	•	•	Reboot
#GPIO	•	•	•	•	General Purpose Input/Output Pin Control
#TEMPSENS	•	•	•	•	Temperature monitor
#QSS	•	•	•	•	Query SIM Status
#SIMDET	•	•	•	•	SIM Dection Mode
#SIMPR	•	•	•	•	SIM Presence Status
#SIMINCFG	•	•	•	•	GPIO SIMIN Configuration
#HSEN	•	•	•	•	Hot-swap Enable
#HWREV	•	•	•	•	Hardware Identification
#ENS				•	Enhanced network selection
#EONS				•	Enhanced operator name string
#USBCFG	•	•	•	•	USB Configuration
+IMEISV	•	•	•	•	Request IMEI and SW version
$GPSP	•	•	•	•	GPS Controller Power Management
$GPSR	•	•	•	•	GPS Reset
$GPSNMUN	•	•	•	•	Unsolicited NMEA Data Configuration
$GPSACP	•	•	•	•	Get Acquired Position
$GPSSAV	•	•	•	•	Save GPS Parameters Configuration
$GPSRST	•	•	•	•	Restore To Default GPS Parameters
$GPSNMUNEX	•	•	•	•	Unsolicited NMEA Extended Data Configuration
$GPSNVRAM	•	•	•	•	GPS NVRAM Parameters Delete

$GPSQOS	•	•	•	•	GPS Quality Of Service
$GPSSLSR	•	•	•	•	GPS Start Location Service Request
$GPSSTOP	•	•	•	•	GPS Stop Location Service Request
$LCSSLP	•	•	•	•	Update SLP address
$LCSTER	•	•	•	•	Update terminal information
$LCSLRMT	•	•	•	•	MT Location Request Mode
$LCSLRV	•	•	•	•	Location request verification
$LTC	•	•	•	•	LCS certificate
$GNSSCONF	•	•	•	•	Configuration of the GNSS Receiver
$GPSLOCK	•	•	•	•	GPS Lock Mode
$GPSANTPORT	•	•	•	•	Configuration of GNSS Antenna Port Type
$AGPSEN	•	•	•	•	Position Mode Configuration
$LCSLPP	•	•	•	•	LPP Configuration
$LCSAGLO	•	•	•	•	Selection fo Positioning Protocol for A-GLONASS
$LOCMODE			•		GPS Location Reqest Mode
$NMEA			•		Enable NMEA Stream
$LOCATION			•		Enable Location Services
$GETLOCATION			•		Get Currrent Location
#BND	•	•	•	•	Select Band
#RXDIV	•			•	Enable RX Diversity and set DARP
#RXTOGGLE	•			•	Swap 3G-RX from main to diversity
#LRXDIV	•	•	•	•	Enable LTE RX Diversity
#SMSFORMAT		•			Select 3GPP or 3GPP2 Format for MO SMS
#ISMSCFG		•			Domain Configuration for Outgoing SMS
#FASTSHDN	•	•	•	•	Configure fast power down
#VCDISABLE	•	•	•	•	Disable Voice Call
#NVIM	•	•	•	•	Non-Volatile Memory Item Management
#TESTMODE	•	•	•	•	Enable Test Mode command in not signalling mode
#MONI	•	•	•	•	Cell Monitor

#RFSTS	•	•	•	•	Read Current Network Status
#SERVINFO	•	•	•	•	Serving Cell Information
#NITZ	•	•	•	•	Network Timezone
#STIA	•	•	•	•	SIM Toolkit Interface Activation
#STGI	•	•	•	•	SIM Toolkit Get Information
#STSR	•	•	•	•	SIM Toolkit Send Response
#LANG	•	•	•	•	Select Language
#USB3TUNE	•	•	•	•	Tuning USB 3.0 PHY
#LCFC	•	•	•	•	LTE Carrier Aggregation Frequencies and Combinations
#CACTL	•	•	•	•	LTE Carrier Aggregation enable and disable
#USBSWITCH	•		•	•	Switch USB configuration
#GETFW	•		•		Get firmware status
#ACTIVEFW	•		•		Active firmware
#CLEARFW	•		•		Clear firmware
#FIRMWARE	•	•	•	•	Active firmware and display firmware
#CAINFO	•	•	•	•	Show LTE CA information
#LAPS	•	•	•	•	LTE Antenna Ports Signals
#ATTOMADMCFG				•	AT&T OMA-DM Configuration management
#HOSTODIS				•	Host ODIS parameters management
#OMASENDPIN				•	OMA-DM Send PIN or NSS
#ICMP	•	•	•	•	ICMP Support
#ICMCONNECT	•	•	•	•	ECM/RNDIS interface connection
#ICMLANCFG	•	•	•	•	Private IP address for ECM/RNDIS and GW, DHCP address setting
#VLANLIST	•	•	•	•	To add or remove a pair of CID and VLAN ID.
#VLANTAGGED	•	•	•	•	To set or read VLAN mode
#ICMROAMINGEN	•	•	•	•	Enable roaming data call

5. AT COMMANDS REFERENCES

5.1. Command Line General Format

5.1.1. Command Line Prefixes

5.1.1.1. Starting A Command Line – AT

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

5.1.1.2. Last Command Automatic Repetition - A/

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

5.1.1.3. Repeat Last Command - AT#/

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

5.2.　　　　　General Configuration Commands

5.2.1.1. Select Interface Style - #SELINT

AT#SELINT – Select Interface Style	
AT#SELINT=<v>	Set command sets the AT command interface style depending on parameter <v>. Parameter: **<v>** - AT command interface style 　2 - switches the AT command interface style of the product to LM940
AT#SELINT?	Read command reports the current interface style.
AT#SELINT=?	Test command reports the available range of values for parameter **<v>**.

5.3.　　　　　Hayes Compliant AT Commands

5.3.1.　　　　　Generic Modem Control

5.3.1.1. Set To Factory-Defined Configuration - &F

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

&F - Set To Factory-Defined Configuration	
	Note: if parameter **<value>** is omitted, the command has the same behaviour as **AT&F0**
Reference	V25ter.

5.3.1.2. Soft Reset – Z

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

5.3.1.3. Default Reset Basic Profile Designation - &Y

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

5.3.1.4. Default Reset Full Profile Designation - &P

&P - Default Reset Full Profile Designation	
AT&P[<n>]	Execution command defines which full profile will be loaded on start up.

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

5.3.1.5. Store Current Configuration - &W

&W - Store Current Configuration	
AT&W[<n>]	Execution command stores on profile **<n>** the complete configuration of the device. Parameter: **<n>** 0..1 - profile number: the wireless module is able to store 2 full configurations Note: if parameter is omitted, the command has the same behaviour of **AT&W0**.

5.3.1.6. Manufacturer Identification - +GMI

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

5.3.1.7. Model Identification - +GMM

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

5.3.1.8. Revision Identification - +GMR

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

5.3.1.9. 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
Reference	V.25ter

5.3.1.10. Serial Number - +GSN

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

5.3.1.11. Display Current Base Configuration And Profile - &V

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

5.3.1.12. Display Current Configuration And Profile - &V0

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

5.3.1.13. S Registers Display - &V1

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

5.3.1.14. 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

&V3 - Extended S Registers Display	
	\<hex\> - current value in hexadecimal notation

5.3.1.15. Display Last Connection Statistics - &V2

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

5.3.1.16. Single Line Connect Message - \V

\V - Single Line Connect Message	

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

5.3.1.17. 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.

5.3.1.18. Line Signal Level - %L

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

5.3.1.19. Line Quality - %Q

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

5.3.1.20. Speaker Loudness - L

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

5.3.1.21. Speaker Mode - M

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

5.3.2.   DTE - Modem Interface Control

5.3.2.1. Command Echo – E

E - Command Echo	
ATE[\<n>]	Set command enables/disables the command echo. Parameter: **\<n>** 0 - disables command echo 1 - enables command echo (factory default) , hence command sent to the device are echoed back to the **DTE** before the response is given. Note: if parameter is omitted, the command has the same behaviour of **ATE0**
Reference	V25ter

5.3.2.2. Quiet Result Codes – Q

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

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

5.3.2.3. Response Format – V

V - Response Format	
ATV[<n>]	Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (see [§3.2.3 Information Responses And Result Codes] for the table of result codes). Parameter: **<n>** 0 - limited headers and trailers and numeric format of result codes | information responses	**<text><CR><LF>**
result codes	**<numeric code><CR>** | 1 - full headers and trailers and verbose format of result codes (factory default) | information responses	**<CR><LF>** **<text><CR><LF>**
result codes	**<CR><LF>** **<verbose code><CR><LF>** | Note: the **<text>** portion of information responses is not affected by this setting.

V - Response Format	
	Note: if parameter is omitted, the command has the same behaviour of ATV0
Reference	V25ter

5.3.2.4. Extended Result Codes – X

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

5.3.2.5. Identification Information – I

I - Identification Information	
ATI[<n>]	Execution command returns one or more lines of information text followed by a result code. Parameter: **<n>** 0 - numerical identifier.

I - Identification Information	
	1 - module checksum
	2 - checksum check result
	3 - manufacturer
	4 - product name
	5 - DOB version
	Note: if parameter is omitted, the command has the same behaviour of **ATI0**
Reference	V25ter

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

&C - Data Carrier Detect (DCD) Control	
AT&C[<n>]	Set command controls **DCD** output behaviour. Parameter: **<n>** 0 - **DCD** remains **high** always. 1 - **DCD** follows the Carrier detect status: if carrier is detected **DCD** is high, otherwise **DCD** is **low**. (factory default) 2 - **DCD off** while disconnecting Note: if parameter is omitted, the command has the same behaviour of **AT&C0** Note: **AT&C** has to be removed from the list of AT command whose parameters are stored in NVM.
Reference	V25ter

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

&D - Data Terminal Ready (DTR) Control	
AT&D[<n>]	Set command controls the Module behaviour to **DTR** transitions. Parameter: **<n>** 0 - **DTR** transitions are ignored. (factory default)

&D - Data Terminal Ready (DTR) Control	
	1 - when the MODULE is connected, the **High** to **Low** transition of **DTR** pin sets the device in command mode, the current connection is NOT closed.
	2 - when the MODULE is connected , the **High** to **Low** transition of **DTR** pin sets the device in command mode and the current connection is closed.
	3 – device ignores **DTR** transitions.
	4 - **C108/1** operation is disabled.
	5 - **C108/1** operation is enabled; same behaviour as for **<n>=2**
	Note: if **AT&D2** has been issued and the **DTR** has been tied **Low**, autoanswering is inhibited and it is possible to answer only issuing command **ATA**.
	Note: Recommended that AT&D2 is issued prior to dial-up network service from DTE. If DTR event is ignored, DCE could be stuck in dormant state in a situation that DCE is not able to communicate with NW(like No service) and DTE tries to disconnect dial-up service.
	But in case of LTE, if the default PDN is used for the connection, the connection will be preserved.
	Note: if parameter is omitted, the command has the same behaviour of **AT&D0**
	Note: if DTR stay in Low, URC message is not issued to DTE
Reference	V25ter

5.3.2.1. Standard Flow Control - \Q

\Q - Standard Flow Control	

AT\Q[<n>]	Set command controls the flow control behaviour.
	
	Parameter:
	<n>
	  0 - no flow control
	  3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default)
	
	Note: It has no effect and is included only for backward compatibility with legacy
	modems.

Reference	V25ter

5.3.2.2. Flow Control - &K

&K - Flow Control	
AT&K[<n>]	Set command controls the flow control behaviour. Parameter: **<n>** 0 - no flow control 3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default) Note: It has no effect and is included only for backward compatibility with legacy modems.

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

&S - Data Set Ready (DSR) Control	
AT&S[<n>]	Set command controls **DSR** pin behaviour. Parameter: **<n>** 0 - always **High** 1 - follows the GSM traffic channel indication. 2 - **High** when connected 3 - **High** when device is ready to receive commands (factory default). Note: if option 1 is selected then **DSR** is tied **High** when the device receives from the network the UMTS traffic channel indication. Note: if parameter is omitted, the command has the same behaviour of **AT&S0** **Note**: If option 1 or 2 are active, **DSR** will not be tied **High** in case of GSM voice connection.

5.3.2.4. Ring (RI) Control - \R

\R - Ring (RI) Control	

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

5.3.2.5. Fixed DTE Interface Rate - +IPR

+IPR - Fixed DTE Interface Rate	
AT+IPR=<rate>	Set command specifies the **DTE** speed at which the device accepts commands during command mode operations; it may be used to fix the **DTE-DCE** interface speed. Parameter: **<rate>** - 300 600 1200 2400 4800 9600 19200 38400 57600 115200 (default) 230400 460800 921600

+IPR - Fixed DTE Interface Rate	
	3200000 3947500 Note: It has no effect and is included only for backward compatibility with legacy modems.
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

5.3.2.6. DTE-Modem Local Flow Control - +IFC

+IFC - DTE-Modem Local Flow Control	
AT+IFC=<by_te>, **<by_ta>**	Set command selects the flow control behaviour of the serial port in both directions: from **DTE** to **modem** (**<by_ta>** option) and from **modem** to **DTE** (**<by_te>**) Parameters: **<by_te>** - flow control option for the data received by **DTE** 0 - flow control None 2 - **C105** (**RTS**) (factory default) **<by_ta>** - flow control option for the data sent by **modem** 0 - flow control None 2 - **C106** (**CTS**) (factory default) The supported flow control list as follows <table><tr><td>**<by_te>**</td><td>**<by_ta>**</td></tr><tr><td>0</td><td>0</td></tr><tr><td>2</td><td>2</td></tr></table> Note: It has no effect and is included only for backward compatibility with legacy

	modems.
AT+IFC?	Read command returns active flow control settings. Note: If flow control behaviour has been set with **AT&Kn** command with the parameter that is not allowed by **AT+IFC** the read command **AT+IFC?** will return: **+IFC: 0,0**
AT+IFC=?	Test command returns all supported values of the parameters **<by_te>** and **<by_ta>**.
Reference	V25ter

+ICF - DTE-Modem Character Framing	
AT+ICF=[<format> ,[<parity>]]	Set command defines the asynchronous character framing to be used when autobauding is disabled.
	Parameters:
	<format> - determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.
	1 - 8 Date, 2 Stop
	2 - 8 Data, 1 Parity, 1 Stop
	3 - 8 Data, 1 Stop (factory default)
	5 - 7 Data, 1 Parity, 1 Stop
	<parity> - determines how the parity bit is generated and checked, if present; setting this sub parameter is mandatory and has a meaning only if **<format>** subparameter is either 2 or 5 otherwise is not allowed.
	0 - Odd (not supported)
	1 - Even (not supported)
	Note: It has no effect and is included only for backward compatibility with legacy modems.
AT+ICF?	Read command returns current settings for sub parameters **<format>** and **<parity>**.
	If current setting of subparameter **<format>** is neither 2 nor 5, the current setting of subparameter **<parity>** will always be represented as 0.
AT+ICF=?	Test command returns the ranges of values for the parameters **<format>** and **<parity>**
Reference	V25ter
Example	*8N2* AT+ICF=1 OK *8O1* AT+ICF=2,0 OK *8E1*

	AT+ICF=2,1
	OK
	8N1
	AT+ICF = 3 (default)
	OK
	7O1
	AT+ICF=5,0
	OK
	7E1
	AT+ICF=5,1
	OK

5.3.3.   Call Control

5.3.3.1. Dial – D

D – Dial	
ATD<number>[;]	Execution command starts a call to the phone number given as parameter.
	If ";" is present, a **voice** call to the given number is performed.
	Parameter:
	<number> - phone number to be dialed
	Note: the numbers accepted are 0-9 and *,#,"A","B","C","D","+".
	Note: for backwards compatibility with landline modems modifiers "T", "P", "R", ",", "W", "!", "@" are accepted but have no effect
ATD*<gprs_sc>[*<addr>][*[<L2P>][*[<cid>]]]]#	This command is specific of GPRS functionality and causes the **MT** to perform whatever actions are necessary to establish communication between the **TE** and the external PDN.
	Parameters:
	<gprs_sc> - GPRS Service Code, a digit string (value 99) which identifies a request to use the GPRS
	<addr> - string that identifies the called party in the address space applicable to the PDP.
	<L2P> - a string which indicates the layer 2 protocol to be used. For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used:

D – Dial	
	1 - PPP **<cid>** - a digit which specifies a particular **PDP** context definitio n (see **+CGDCONT** command).
Reference	V25ter.

5.3.3.2. Answer – A

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

5.3.3.3. Disconnect – H

H – Disconnect	
ATH	Execution command is used to close the current conversation (voice or data). Note: this command can be issued only in command mode; when a data conversation is active the device is in on-line mode (commands are not sensed and characters are sent to the other party), hence escape sequence is required before issuing this command, otherwise if **&D1** option is active, **DTR** pin has to be tied **Low** to return in command mode.
Reference	V25ter.

5.3.4.   Modulation Control

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

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

5.3.5. Compression Control

5.3.5.1. Data Compression - +DS

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

5.3.5.2. Data Compression Reporting - +DR

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

5.3.6. S Parameters

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

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

Reference: V25ter

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

- **AT=<value><CR>** sets the contents of the last S-paramter accessed with ATSn=<value> command
  Example:
  AT=40<CR> sets the content of S2 to 40

- **AT?** returns the current value of the last S-parameter accessed with ATSn=<value> commandTip or Information – Provides advice and suggestions that may be useful when integrating the module.

5.3.6.1. Escape Character - S2

S2 - Escape Character	
ATS2=<char>	Set command sets the ASCII character to be used as escape character. Parameter: **<char>** - escape character decimal ASCII 0..255 - factory default value is 43 (+). Note: the escape sequence consists of three escape characters preceded and followed by *n* ms of idle (see **S12** to set *n*).

S2 - Escape Character	
ATS2?	Read command returns the current value of **S2** parameter.
	Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.3.6.2. Command Line Termination Character - S3

S3 - Command Line Termination Character	
ATS3=<char>	Set command sets the value of the character either recognized by the device as command line terminator or generated by the device as part of the header, trailer, and terminator for result codes and information text, along with **S4 parameter**.
	Parameter:
	<char> - command line termination character (decimal ASCII)
	0..127 - factory default value is 13 (ASCII **<CR>**)
	Note: the "previous" value of **S3** is used to determine the command line termination character for entering the command line containing the **S3** setting command. However the result code issued shall use the "new" value of **S3** (as set during the processing of the command line)
ATS3?	Read command returns the current value of **S3 parameter**.
	Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.3. 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**)

S4 - Response Formatting Character	
	Note: if the value of **S4** is changed in a command line the result code issued in response of that command line will use the new value of **S4**.
ATS4?	Read command returns the current value of S4 parameter. Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.4. Command Line Editing Character - S5

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

5.3.6.5. 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**.

S7 - Connection Completion Time-Out	
	Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.3.6.6. Carrier Off With Firm Time - S10

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

5.3.6.7. Escape Prompt Delay - S12

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

5.3.6.8. 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

5.3.6.9. Disconnect Inactivity Timer – S30

S30 -Disconnect Inactivity Timer	

ATS30=<tout>	Set command defines the inactivity time-out in minutes. The device disconnects if no characters are exchanged for a time period of at least **<tout>** minutes.
	
	Parameter:
	
	<tout> - expressed in minutes
	
	  0 - disabled, disconnection due to inactivity is disabled (factory default).
	
	  1..127 - inactivity time-out value

ATS30?	Read command returns the current value of **S30 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.3.6.10. Delay Before Forced Hang Up – S38

S38 -Delay To Before Forced Hang Up	
ATS38=<delay>	Set command has no effect and it included only for backward compatibility. Parameter: **<delay>** - expressed in seconds

S38 -Delay To Before Forced Hang Up	
	0..255 - factory default value is 0.
ATS38?	Read command returns the current value of **S38 parameter**. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.4. 3GPP TS 27.007 AT Commands

5.4.1. General

5.4.1.1. Network Selection Menu Availability - +PACSP

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

5.4.1.2. Request Manufacturer Identification - +CGMI

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

5.4.1.3. Request Model Identification - +CGMM

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

5.4.1.4. 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.

+CGMR - Request Revision Identification	
Reference	3GPP TS 27.007

5.4.1.5. Request Product Serial Number Identification - +CGSN

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

5.4.1.6. Select TE Character Set - +CSCS

+CSCS - Select TE Character Set	
AT+CSCS= **[<chset>]**	Set command sets the current character set used by the device. Parameter: **<chset>** - character set "GSM" - GSM default alphabet (3GPP TS 23.038) "IRA" - international reference alphabet (ITU-T T.50) "8859-1" - ISO 8859 Latin 1 character set "PCCP437" - PC character set Code Page 437 "UCS2" - 16-bit universal multiple-octet coded character set (ISO/IEC10646)
AT+CSCS?	Read command returns the current value of the active character set.
AT+CSCS=?	Test command returns the supported values for parameter **<chset>**.
Reference	3GPP TS 27.007

5.4.1.7. 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**.

+CIMI - Request International Mobile Subscriber Identify (IMSI)	
AT+CIMI=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

5.4.1.8. 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: 89014104243627585306 OK

5.4.2.   Call Control

5.4.2.1. Extended Error Report - +CEER

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

5.4.3. Network Service Handling

5.4.3.1. Subscriber Number - +CNUM

+CNUM - Subscriber Number	

AT+CNUM	Execution command returns the MSISDN (if the phone number of the device has been stored in the SIM card) in the format:
	
	+CNUM: \<alpha>,\<number>,\<type>[\<CR>\<LF>
	+CNUM: \<alpha>,\<number>,\<type>[…]]
	
	where:
	\<alpha> - alphanumeric string associated to **\<number>**; used character set should be the one selected with **+CSCS**.
	\<number> - string containing the phone number in the format **\<type>**
	\<type> - type of number:
	  129 - national numbering scheme
	  145 - international numbering scheme (contains the character "+").

AT+CNUM=?	Test command returns the **OK** result code
Example	AT+CNUM +CNUM: "PHONENUM1","2173848500",129 +CNUM: "FAXNUM","2173848501",129 +CNUM: "DATANUM","2173848502",129
Reference	3GPP TS 27.007

5.4.3.2. Read Operator Names - +COPN

+COPN – Read Operator Names	

AT+COPN	Execution command returns the list of operator names from the **ME** in the format:
	
	+COPN:\<numeric1>,\<alpha1>[\<CR>\<LF>
	+COPN:\<numeric2>,\<alpha2>[…]]
	
	where:
	  \<numericn> - string type, operator in numeric format (see +**COPS**)
	  \<alphan> - string type, operator in long alpha numeric format(see +**COPS**)

+COPN – Read Operator Names	
AT+COPN=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

5.4.3.3. Network Registration Report - +CREG

+CREG – Network Registration Report	
AT+CREG=[<mode >]	Set command enables/disables network registration reports depending on the parameter <**mode**>. **Parameter:** **<mode>** 0 - disable network registration unsolicited result code (factory default) 1 - enable network registration unsolicited result code 2 - enable network registration unsolicited result code with network Cell identification data If **<mode>=1**, network registration result code reports: **+CREG: <stat>** **Where:** **<stat>** 0 - not registered, ME is not currently searching a new operator to register to 1 - registered, home network 2 - not registered, but ME is currently searching a new operator to register to 3 - registration denied 4 - unknown 5 - registered, roaming If **<mode>=2**, network registration result code reports: **+CREG: <stat>[,[<lac>],[<ci],[<AcT>]]** **Where:** **<lac>:** string type; two byte location area code (when <Act> indicates value 0 to 6). In hexadecimal format

+CREG – Network Registration Report	
	<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. **Note:** 4G/3G only products like LM940 does not support GSM access technology**.**
AT+CREG?	Read command reports the **<mode>** and **<stat>** parameter values in the format: **+CREG: <mode>,<stat>[<lac>,<ci>,<AcT>]** **Note: <lac>,<ci> and <AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CREG=?	Test command returns the range of supported**<mode>**
Example	AT OK at+creg? +CREG: 0,2 OK *(the MODULE is in network searching state)* at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,1

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

5.4.3.4. EPS – Network Registration status +CEREG

+CEREG – EPS Network Registration Status	

AT+CEREG=[<n>]	The Set command controls the presentation of an unsolicited result code.
	
	+CEREG: (see format below).
	
	Parameter:
	<n> - result code presentation mode
	 0 - disable network registration unsolicited result code
	 1 - enable network registration unsolicited result code; if there is a change in the terminal EPS network registration status, it is issued the unsolicited result code:
	
	 +CEREG: <stat>
	
	 where:
	 <stat> - registration status
	  0 - not registered, terminal is not currently searching a new operator to register to
	  1 - registered, home network
	  2 - not registered, but terminal is currently searching a new operator to register to
	  3 - registration denied
	  4 - unknown(e.g. out of E-UTRAN coverage).
	  5 - registered, roaming

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

+CEREG – EPS Network Registration Status	
Reference	3GPP TS 27.007

5.4.3.5. Operator Selection - +COPS

+COPS – Operator Selection	

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

	Note: 4G/3G only products like LM940 does not support GSM access technology**.**
	Note: If module has an invalid SIM or SIM card is not initialized completely, +COPS mode 2 can be displayed although user changed to another value such as 0 or 1.

AT+COPS?	Read command returns current value of **<mode>**,**<format>** and **<oper>** in format **<format>**; if no operator is selected, **<format>** and **<oper>** are omitted
	
	+COPS: <mode>[,<format>,<oper>,< AcT>]
	
	where:
	<AcT>: access technology selected
	  0 - GSM
	  2 - UTRAN
	  3 - GSM w/EGPRS
	  4 - UTRAN w/HSDPA
	  5 - UTRAN w/HSUPA
	  6 - UTRAN w/HSDPA and HSUPA
	
	  7 - E-UTRAN

AT+COPS=?	Test command returns a list of quintuplets, each representing an operator present in the network.
	The quintuplets in the list are separated by commas:
	
	+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>,< AcT>)s]
	[,,(list of supported <mode>s),(list of supported <format>s)]
	
	where:
	<stat> - operator availability
	  0 - unknown
	  1 - available
	  2 - current
	  3 - forbidden
	
	<AcT>: access technology selected
	  0 - GSM
	  2 - UTRAN
	  7 - E-UTRAN
	
	Note: once the command done with network scan, this command may require some seconds before the output is given.

Example	AT+COPS? +COPS: 0,0,"Test PLMN 1-1",0 OK AT+COPS=?

	+COPS: (2,"","","45008",2),(1,"Test PLMN 1-1","Test1-1","00101",0),(3,"","","45005",2),,(0-4),(0-2)
	OK
Reference	3GPP TS 27.007

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

+WS46 – PCCA STD-101 Select Wireless Network	
AT+WS46=[<n>]	Set command selects the cellular network (Wireless Data Service, WDS) to operate with the **TA** (WDS-Side Stack Selection).
	Parameter:
	<n> - integer type, it is the WDS-Side Stack used by the **TA**.
	12 GSM Digital Cellular Systems (GERAN only)
	22 UTRAN only
	25 3GPP Systems (GERAN and UTRAN and E-UTRAN)
	28 E-UTRAN only
	29 GERAN and UTRAN
	30 GERAN and E-UTRAN
	31 UTRAN and E-UTRAN
	Note: The values in **<n>** for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned.
	Note: **<n>** parameter setting is stored in NVM and available at once.
	Note: The Generic and AT&T module of LM940 can set support **<n>** parameter values 22, 28 and 31 only. 31 is factory default.
	Note: The Verizon and Sprint module of LM940 can set only **<n>** parameter values 28 (LTE technology) and that is factory default.
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

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

+CLCK - Facility Lock/Unlock	
	<class> - sum of integers each representing a class of information (default is 7)
	1 - voice (telephony)
	2 - data (refers to all bearer services)
	4 - fax (facsimile services)
	8 - short message service
	16 - data circuit sync
	32 - data circuit async
	64 - dedicated packet access
	128 - dedicated PAD access
	Note: when **<mode>=2** and command successful, it returns: **+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>** **[…]]**
	where **<status>** - the current status of the facility 0 - not active 1 - active **<class*n*>** - class of information of the facility
	Note: LM940 does not support a network facility related with voice.
AT+CLCK=?	Test command reports all the facilities supported by the device.
Reference	3GPP TS 27.007
Example	*Querying such a facility returns an output on three rows, the first for voice, the second for data, the third for fax:* AT+CLCK ="AO",2 +CLCK: <status>,1 +CLCK: <status>,2 +CLCK: <status>,4

+CPWD - Change Facility Password	

AT+CPWD=<fac>, <oldpwd>, <newpwd>	Execution command changes the password for the facility lock function defined by command Facility Lock **+CLCK**.
	
	Parameters:
	<fac> - facility
	  "AB" - All Barring services
	       (applicable only for **<mode>=0**)
	  "AC" - All inComing barring services
	       (applicable only for **<mode>=0**)
	  "AG" - All outGoing barring services
	       (applicable only for **<mode>=0**)
	  "AI" - BAIC (Barr All Incoming Calls)
	  "AO" - BAOC (Barr All Outgoing Calls)
	  "IR" - BIC-Roam (Barr Incoming Calls
	       When Roaming outside the home country)
	  "OI" - BOIC (Barr Outgoing International Calls)
	  "OX" - BOIC-exHC (Barr Outgoing International
	       Calls except to Home Country)
	  "SC" - SIM (PIN request)
	  "P2" - SIM PIN2
	  "PN" - network Personalisation
	  "PU" - network subset Personalisation
	  "PP" - service Provider Personalization (refer 3GPP TS 22.022 [33])
	  "PC" - Corporate Personalization (refer 3GPP TS 22.022 [33])
	  "PF" - lock Phone to the very First inserted SIM/UICC card
	      (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)
	
	<oldpwd> - string type, it shall be the same as password specified for the facility from the ME user interface or with command **+CPWD**.
	<newpwd> - string type, it is the new password

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

5.4.3.9. Preferred Operator List - +CPOL

+CPOL – Preferred Operator List	

AT+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>, <GSM_Compact_AcT>, <UTRAN_AcT>, <EUTRAN_AcT>]]]	Execution command writes an entry in the SIM list of preferred operators.
	
	Parameters:
	
	<index> - integer type; the order number of operator in the SIM preferred operator list
	
	  1..*n*
	
	<format>
	
	  0 – long format alphanumeric **<oper>**
	
	  1 – short format alphanumeric **<oper>**
	
	  2 – numeric **<oper>**
	
	<oper> - string type
	
	<GSM_AcT> - GSM access technology
	
	  0 – access technology not selected
	
	  1 – access technology selected
	
	<GSM_Compact_AcT> - GSM compact access technology
	
	  0 – access technology not selected
	
	  1 – access technology selected

+CPOL – Preferred Operator List	

	<UTRA_AcT> - UTRA access technology
	
	  0 – access technology not selected
	
	  1 – access technology selected
	
	<E-UTRAN_AcT*n*> - E-UTRAN access technology:
	
	  0 – access technology not selected
	
	  1 – access technology selected
	
	Note: if **<index>** given but **<oper>** left out, the entry deleted. If **<oper>** given but
	
	<index> left out, **<oper>** put in the next free location. If only **<format>** given, the
	
	format of the **<oper>** in the read command changes. Currently
	
	<GSM_Compact_AcT> not supported but set value is acceptable.
	
	Note: 4G/3G only products like LM940 does not support GSM access technology**.**
	
	Note: The User controlled PLMN could not be read/wrote/returned values and range on some SIM like AT&T when it set to CPLS 0 because the EF_PLMNwACT field does not exist.

AT+CPOL?	Read command returns all used entries from the SIM list of preferred operators.
AT+CPOL=?	Test command returns the whole **<index>** range supported by the SIM and the range for the parameter **<format>**
Reference	3GPP TS 27.007

5.4.3.10. Selection of preferred PLMN list – +CPLS

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

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

5.4.4. Mobile Equipment Control

5.4.4.1. Phone Activity Status - +CPAS

+CPAS – Phone Activity Status	

AT+CPAS	Execution command reports the device status in the form:
	
	+CPAS: \<pas\>
	
	Where:
	\<pas\> - phone activity status
	
	  0 - ready (device allows commands from **TA/TE**)
	  1 - unavailable (device does not allow commands from **TA/TE**)
	  2 - unknown (device is not guaranteed to respond to instructions)
	  3 - ringing (device is ready for commands from **TA/TE**, but the ringer is active)
	  4 - call in progress (device is ready for commands from **TA/TE**, but a call is in progress)
	
	Note: '1' and '2' at \<pas\> is not supported.
	Note: In the LTE registration state, CPAS: 4 (call in progress) is displayed.

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 – Phone Activity Status	
	+CPAS: 4 *the called phone has answered to your call* OK ATH OK
Reference	3GPP TS 27.007

5.4.4.2. Set Phone Functionality - +CFUN

+CFUN - Set Phone Functionality	

AT+CFUN=
 [<fun>[,<rst>]]
	Set command selects the level of functionality in the ME.
	
	 Parameters:
	 <fun> - is the power saving function mode
	   0 - minimum functionality (low power mode)
	   1 - mobile full functionality (factory default)
	   4 - disable both TX and RX
	  6 - reset
	  7 - offline mode
	
	 Special modes, you can see them through the read command but you can't set those mode :
	  5 – factory test mode
	
	 <rst> - reset flag
	  0 - do not reset the ME before setting it to **<fun>** functionality level (default)
	  1 - reset the ME before setting it to **<fun>** full functionality.
	
	 Note: issuing **AT+CFUN=0[,0]** actually causes the module to perform either a network deregistration and a SIM deactivation.
	 Note : In the **<fun>=7**(offline), modem can only be changed to **<fun>=6**(reset)

AT+CFUN?	Read command reports the current setting of **<fun>**.

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

5.4.4.3. Enter PIN - +CPIN

+CPIN - Enter PIN	
AT+CPIN=<pin> [,<newpin>]	Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.).
	If the PIN required is SIM PUK or SIM PUK2, the **<newpin>** is required. This second pin, **<newpin>** will replace the old pin in the SIM.
	The command may be used to change the SIM PIN by sending it with both parameters **<pin>** and **<newpin>** when PIN request is pending; if no PIN request is pending the command will return an error code and to change the PIN the command **+CPWD** must be used instead.
	Parameters:
	<pin> - string type value
	<newpin> - string type value.
	To check the status of the PIN request use the command **AT+CPIN?**
AT+CPIN?	Read command reports the PIN/PUK/PUK2 request status of the device in the form:
	+CPIN: <code>
	where:
	<code> - PIN/PUK/PUK2 request status code
	READY - ME is not pending for any password
	SIM PIN - ME is waiting SIM PIN to be given
	SIM PUK - ME is waiting SIM PUK to be given
	PH-SIM PIN - ME is waiting phone-to-SIM card password to be given
	PH-FSIM PIN - ME is waiting phone-to-very first SIM card password to be given
	PH-FSIM PUK - ME is waiting phone-to-very first SIM card unblocking password to be given
	SIM PIN2 - ME is waiting SIM PIN2 to be given; this **<code>** is returned only when the last executed command

+CPIN - Enter PIN	
	resulted in PIN2 authentication failure (i.e. **+CME ERROR: 17**)
	SIM PUK2 - ME is waiting SIM PUK2 to be given; this **<code>** is returned only when the last executed command resulted in PUK2 authentication failure (i.e. **+CME ERROR: 18**)
	PH-NET PIN - ME is waiting network personalization password to be given
	PH-NET PUK - ME is waiting network personalization unblocking password to be given
	PH-NETSUB PIN - ME is waiting network subset personalization password to be given
	PH-NETSUB PUK - ME is waiting network subset personalization unblocking password to be given
	PH-SP PIN - ME is waiting service provider personalization password to be given
	PH-SP PUK - ME is waiting service provider personalization unblocking password to be given
	PH-CORP PIN - ME is waiting corporate personalization password to be given
	PH-CORP PUK - ME is waiting corporate personalization unblocking password to be given
	Note: Pin pending status at startup depends on PIN facility setting, to change or query the default power up setting use the command **AT+CLCK=SC,<mode>,<pin>**
AT+CPIN=?	Test command returns **OK** result code.
Example	AT+CMEE=1
	OK
	AT+CPIN?
	+CME ERROR: 10 *error: you have to insert the SIM*
	AT+CPIN?
	+CPIN: READY *you inserted the SIM and device is not waiting for PIN to be given*
	OK
Reference	3GPP TS 27.007

+CSQ - Signal Quality	

AT+CSQ	Execution command reports received signal quality indicators in the form:
	
	+CSQ: <rssi>,**<ber>**
	where
	<rssi> - received signal strength indication
	  0 - (-113) dBm or less
	  1 - (-111) dBm
	  2..30 - (-109)dBm..(-53)dBm / 2 dBm per step
	  31 - (-51)dBm or greater
	  99 - not known or not detectable
	<ber> - bit error rate
	 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
	
	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]:

+CSQ - Signal Quality	
	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:
	In GSM, the received signal strength indication is the average of the received signal level measurement samples in dBm, taken on a channel within the reporting period of length one SACCH multi frame, and is mapped as above.
	For UMTS, the current radio signal strength indicates CPICH RSCP in levels.
	For UMTS, radio signal quality CPICH EC/IO range -24db to 0db is scaled to 0 to 7 as <ber> to maintain compatibility.(3GPP 25.133 section 9.1.2.)
	For LTE, the execution command reports received signal strength and indicators in the form:
	+CSQ: <**RSSI**>,<**RSRQ**>
	Where:
	<**RSSI**> **-** Received Signal Strength Indicator.
	<**RSRQ**> **-** Reference Signal Received Quality.
	Note: 4G/3G only products like LM940 does not support GSM access technology.
AT+CSQ=?	Test command returns the supported range of values of the parameters **<rssi>** and **<ber>**.

+CSQ - Signal Quality	
	Note: although **+CSQ** is an execution command without parameters, ETSI 07.07 requires the Test command to be defined.
Reference	3GPP TS 27.007

5.4.4.5. Indicator Control - +CIND

+CIND - Indicator Control	
AT+CIND= [<state> [,<state>[,…]]]	Set command is used to control the registration state of ME indicators, in order to automatically send the **+CIEV** URC, whenever the value of the associated indicator changes. The supported indicators (**<descr>**) and their order appear from test command **AT+CIND=?** Parameter: **<state>** - registration state 0 - the indicator is deregistered; there's no unsolicited result code (**+CIEV** URC) automatically sent by the ME to the application, whenever the value of the associated indicator changes; the value can be directly queried with **+CIND?** 1 - the indicator is registered: an unsolicited result code (**+CIEV** URC) is automatically sent by the ME to the application, whenever the value of the associated indicator changes; it is still possible to query the value through **+CIND?** (default)
AT+CIND?	Read command returns the current value of ME indicators, in the format: **+CIND: <ind>[,<ind>[,…]]** Note: the order of the values **<ind>s** is the same as that in which the associated indicators appear from test command **AT+CIND=?**

AT+CIND=?	Test command returns pairs, where string value **<descr>** is a description (max. 16 chars) of the indicator and compound value is the supported values for the indicator, in the format:
	
	+CIND: ((<descr>, (list of supported <ind>s))[,(<descr>, (list of supported <ind>s))[,…]])
	
	where:
	<descr> - indicator names as follows (along with their **<ind>** ranges)
	  "battchg" - battery charge level
	    <ind> - battery charge level indicator range
	      0..5
	      99 - not measurable
	  "signal" - signal quality
	    <ind> - signal quality indicator range
	      0..7
	      99 - not measurable

+CIND - Indicator Control	

	"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
	"call" - call in progress
	  \<ind\> - call in progress indicator range
	    0 - there's no calls in progress
	    1 - at least a call has been established
	"roam" - roaming
	  \<ind\> - roaming indicator range
	    0 - registered to home network or not registered
	    1 - registered to other network
	"smsfull" - a short message memory storage in the MT has
	      become full (1), or memory locations are available (0)
	  \<ind\> - short message memory storage indicator range
	    0 - memory locations are available
	    1 - a short message memory storage in the MT has become full.
	"rssi" - received signal (field) strength
	  \<ind\> - received signal strength level indicator range
	    0 - signal strength ≤ (-112) dBm
	    1..4 - signal strength in 15 dBm steps
	    5 - signal strength ≥ (-51) dBm
	    99 - not measurable

Example	*Next command causes all the indicators to be registered* AT+CIND=1,1,1,1,1,1,1,1,1 *Next command causes all the indicators to be de-registered* AT+CIND=0,0,0,0,0,0,0,0,0 *Next command to query the current value of all indicators* AT+CIND? CIND: 4,0,1,0,0,0,0,0,2 OK
Note	See command **+CMER**
Reference	3GPP TS 27.007

+CMER - Mobile Equipment Event Reporting	
AT+CMER= **[<mode>** **[,<keyp>** **[,<disp>** **[,<ind>** **[,<bfr>]]]]]**	Set command enables/disables sending of unsolicited result codes from TA to TE in the case of indicator state changes (n.b.: sending of URCs in the case of key pressings or display changes are currently not implemented). Parameters: **<mode>** - controls the processing of unsolicited result codes 0 - buffer **+CIEV** Unsolicited Result Codes(default) 1 - discard **+CIEV** Unsolicited Result Codes when TA-TE link is reserved (e.g. on-line data mode); otherwise forward them directly to the TE. 2 - buffer **+CIEV** Unsolicited Result Codes in the TA when TA-TE link is reserved (e.g. on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE. 3 - forward **+CIEV** Unsolicited Result Codes directly to the TE; when TA is in on-line data mode each **+CIEV** URC is stored in a buffer; once the ME goes into command mode (after **+++** was entered), all URCs stored in the buffer will be output. **<keyp>** - keypad event reporting 0 - no keypad event reporting **<disp>** - display event reporting 0 - no display event reporting **<ind>** - indicator event reporting 0 - no indicator event reporting(default) 2 - indicator event reporting **<bfr>** - TA buffer clearing 0 - TA buffer of unsolicited result codes is cleared when <mode> 1..3 is entered(default) 1 - TA buffer of unsolicited result codes is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes) Note: After AT+CMER has been switched on with e.g. AT+CMER=2,0,0,2 command (i.e. <bfr> is 0), URCs for all registered indicators will be issued only first time, if previous <mode> was 0, for backward compatibility. Values shown by the indicators will be current indicators values, not buffered ones. Subsequent AT+CMER commands with <mode> different from 0 and <bfr> equal to 0 will not flush the codes,

+CMER - Mobile Equipment Event Reporting	
	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

+CPBS - Select Phonebook Memory Storage	
AT+CPBS= **<storage>** **[,<password>]**	Set command selects phonebook memory storage **<storage>**, which will be used by other phonebook commands. Parameter: **<storage>** "SM" - SIM phonebook "FD" - SIM fixed dialling-phonebook (only phase 2/2+ SIM) "LD" - SIM last-dialling-phonebook (**+CPBF** is not applicable for this storage) "MC" - device missed (unanswered received) calls list (**+CPBF** is not applicable for this storage) "RC" - ME received calls list (**+CPBF** is not applicable for this storage). "MB" - mailbox numbers stored on SIM; it is possible to select this storage only if the **mailbox** service is provided by the SIM. "DC" - ME last-dialing-phonebook (**+CPBF** is not applicable for this storage). "ME" - MT phonebook "EN" - SIM/USIM (or MT) emergency number (**+CPBW** is not be applicable for this storage) "ON" - SIM own numbers (MSISDNs) phonebook "SD" - SIM Service Dialling Numbers (SDN) phonebook (**+CPBW** is not applicable for this storage). <password>: string type value representing the PIN2-code required when selecting PIN2-code locked <storage> above "FD" Note: If **"SM"** is the currently selected phonebook, selecting**"FD"** phonebook with "**AT+CPBS="FD"**" command simply selects the FDN as the phonebook upon which all subsequent **+CPBW, +CPBF** and **+CPBR** commands act; the command does not deactivate "SM" phonebook, and does not activate FDN Note: if **<password>** parameter is given, PIN2 will be verified, even if it is not required, i.e. it has already been inserted and verified during current session
AT+CPBS?	Read command returns the actual values of the parameter **<storage>**, the number of occupied records **<used>** and the maximum index number **<total>**, in the format:

+CPBS - Select Phonebook Memory Storage	
	+CPBS: \<storage\>,\<used\>,\<total\> Note: For **\<storage\>=”MC”**: if there are more than one missed calls from the same number the read command will return only the last call.
AT+CPBS=?	Test command returns the supported range of values for the parameters **\<storage\>**.
Reference	3GPP TS 27.007
Example	AT+CPBS=”SM” *current phonebook storage is SIM* AT+CPBR=1 +CPBR: 1,"0105872928",129,"James" OK

5.4.4.8. Read Phonebook Entries - +CPBR

+CPBR - Read Phonebook Entries	
AT+CPBR= **\<index1\>** **[,\<index2\>]**	Execution command returns phonebook entries in location number range **\<index1\>**..**\<index2\>** from the current phonebook memory storage selected with **+CPBS**. If **\<index2\>** is omitted, only location **\<index1\>** is returned. Parameters: **\<index1\>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). **\<index2\>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). The response format is: **[+CPBR:** **\<index1\>,\<number\>,\<type\>,\<text\>**[,\<hidden\>][,\<group\>][,\<adnumber\>][,\<adtype\>][,\<secondtext\>][,\<email\>]]**[\<CR\>\<LF\>** **+CPBR:** **\<index2\>,\<number\>,\<type\>,\<text\>**[,\<hidden\>][,\<group\>][,\<adnumber\>][,\<adtype\>][,\<secondtext\>][,\<email\>]]**[…]]]** where: **\<index*n*\>** - the location number of the phonebook entry **\<number\>** - string type phone number of format **\<type\>** **\<type\>** - type of phone number octet in integer format 129 - national numbering scheme

+CPBR - Read Phonebook Entries	
	145 - international numbering scheme (contains the character "**+**")
	<text> - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.**
	<group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
	<adnumber>: additional number ; string type phone number of format <adtype>
	<adtype>: type of address octet in integer format
	<secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
	<email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
	<hidden>: indicates if the entry is hidden or not
	0: phonebook entry not hidden
	1: phonebook entry hidden
	Note: if "MC" is the currently selected phonebook memory storage, a sequence of missed calls coming from the same number will be saved as one missed call and **+CPBR** will show just one line of information.
	Note: If all queried locations are empty (but available), no information text lines will be returned, while if listing fails in an **ME** error, **+CME ERROR: <err>** is returned.
AT+CPBR=?	Test command returns the supported range of values for parameters **<index*n*>** and the maximum lengths of **<number>**, **<text>**, <group>, <secondtext> and <email> fields fields, in the format:
	+CPBR: (<minIndex> - <maxIndex>),<nlength>,<tlength>,<glength>,<slength>,<elength>
	where:
	<minIndex> - the minimum **<index>** number, integer type

+CPBR - Read Phonebook Entries	
	<maxIndex>- the maximum **<index>** number, integer type
	<nlength> - maximum **<number>** field length, integer type
	<tlength> - maximum **<name>** field length, integer type
	<glength>: integer type value indicating the maximum length of field <group>
	<slength>: integer type value indicating the maximum length of field <secondtext>
	<elength>: integer type value indicating the maximum length of field <email>
	Note: the value of **<nlength>** could vary, depending on the availability of Extension service, in the following situations:
	1. if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service
	2. if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service
	3. if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS="ME"
	OK
	AT+CPBS?
	+CPBS: "ME",1,100
	OK
	AT+CPBR=?
	+CPBR: (1-100),40,255
	OK
	AT+CPBR=1
	+CPBR: 1,"01048771234",129,"James"
	OK
Reference	3GPP TS 27.007

+CPBF - Find Phonebook Entries	

AT+CPBF=
<findtext>
	Execution command returns phonebook entries (from the current phonebook memory storage selected with **+CPBS**) which alphanumeric field start with string **<findtext>**.
	
	Parameter:
	<findtext> - string type; used character set should be the one selected with command **+CSCS.**
	
	The command returns a report in the form:
	
	[+CPBF:
	<index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]**[<CR><LF>**
	
	+CPBF:
	<index2>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>] **[…]]]**
	
	where:
	<index*n*> - the location number of the phonebook entry
	<number> - string type phone number of format **<type>**
	<type> - type of phone number octet in integer format
	  129 - national numbering scheme
	  145 - international numbering scheme (contains the character "**+**")
	<text> - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.**
	  <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
	  <adnumber>: additional number ; string type phone number of format <adtype>
	  <adtype>: type of address octet in integer format
	  <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS

+CPBF - Find Phonebook Entries	
	<email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
	<hidden>: indicates if the entry is hidden or not
	0: phonebook entry not hidden
	1: phonebook entry hidden
	Note: **+CPBF** is not applicable if the current selected storage (see **+CPBS**) is either "MC", either "RC" or "LD".
	Note: if **<findtext>=""** the command returns all the phonebook records.
	Note: if no PB records satisfy the search criteria then an **ERROR** message is reported.
AT+CPBF=?	Test command reports the maximum lengths of **<number>** and **<text>** fields, in the format:
	+CPBF:
	<nlength>,<tlength>,<glength>,<slength>,<ele ngth>
	where:
	<nlength> - maximum length of field **<number>**, integer type
	<tlength> - maximum length of field **<text>**, integer type
	<glength>: integer type value indicating the maximum length of field <group>
	<slength>: integer type value indicating the maximum length of field <secondtext>
	<elength>: integer type value indicating the maximum length of field <email>
	Note: the value of **<nlength>** could vary, depending on the availability of Extension service, in the following situations:

	if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service
	    if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service
	    if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service

+CPBF - Find Phonebook Entries	
	Note : Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS="ME" Selecting phonebook OK AT+CPBF="J" Searching for string "J" +CPBF: 1,"01048771234",129,"James" +CPBF: 2,"0169998888",129,"Jane" OK Searching for everything in phone book, and finding all entries AT+CPBF="" +CPBF: 1,"01048771234",129,"James" +CPBF: 2,"0169998888",129,"Jane" +CPBF: 7,"0115556666",129,"Juliet" +CPBF: 5,"0181111234",129,"Kevin" OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Reference	3GPP TS 27.007

5.4.4.10. Write Phonebook Entry - +CPBW

+CPBW - Write Phonebook Entry	
AT+CPBW= **[<index>]** **[,<number>** **[,<type>** **[,<text>** **[,<group>** **[,<adnumber>** **[,<adtype>** **[,<secondtext>** **[,<email>**	Execution command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with **+CPBS**. Parameters: **<index>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). **<number>** - string type, phone number in the format **<type>** **<type>** - the type of number 129 - national numbering scheme

+CPBW - Write Phonebook Entry	
[,<hidden>]]]]]]]]]	145 - international numbering scheme (contains the character "**+**")
	<text> - the text associated to the number, string type; used character set should be the one selected with command **+CSCS**.
	<group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
	<adnumber>: additional number ; string type phone number of format <adtype>
	<adtype>: type of address octet in integer format
	<secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
	<email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
	<hidden>: indicates if the entry is hidden or not
	0: phonebook entry not hidden
	1: phonebook entry hidden
	Note: If record number **<index>** already exists, it will be overwritten.
	Note: if either **<number>**, **<type>** and **<text>** are omitted, the phonebook entry in location **<index>** is deleted.
	Note: if **<index>** is omitted or **<index>**=0, the number **<number>** is stored in the first free phonebook location. (example at+cpbw=0,"+390404192701",129,"Text" and at+cpbw=,"+390404192701",129,"Text")
	Note: if either "LD", "MC" or "RC" memory storage has been selected (see **+CPBS**) it is possible just to delete the phonebook entry in location **<index>**, therefore parameters **<number>**, **<type>** and **<text>** must be omitted.
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 - Write Phonebook Entry	
	+CPBW: (list of supported \<index>s),\<nlength>,
	(list of supported \<type>s),\<tlength>,\<glength>,\<slength>,\<elength>
	where:
	\<nlength> - integer type value indicating the maximum length of field **\<number>**.
	\<tlength> - integer type value indicating the maximum length of field **\<text>**
	\<glength>: integer type value indicating the maximum length of field \<group>
	\<slength>: integer type value indicating the maximum length of field \<secondtext>
	\<elength>: integer type value indicating the maximum length of field \<email>
	Note: the value of **\<nlength>** could vary, depending onthe availability of Extension service, in the following situations: 1. if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service 2. if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service 3. if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service
Reference	3GPP TS 27.007
Example	AT+CPBW=? +CPBW: (1-100),40,(129, 145),255 OK AT+CPBW=6,"18651896699",129,"John" OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.

5.4.4.11. Clock Management - +CCLK

AT+CCLK – Clock Management	
AT+CCLK=\<time>	Set command sets the real-time clock of the **ME**. Parameter: **\<time>** - current time as quoted string in the format:

AT+CCLK – Clock Management	
	"**yy/MM/dd,hh:mm:ss±zz**" **yy** - year (two last digits are mandatory), range is 00..99 **MM** - month (two last digits are mandatory), range is 01..12 **dd** - day (two last digits are mandatory); The range for dd (day) depends both on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31) Trying to enter an out of range value will raise an error **hh** - hour (two last digits are mandatory), range is 00..23 **mm** - minute (two last digits are mandatory), range is 00..59 **ss** - seconds (two last digits are mandatory), range is 00..59 **±zz** - time zone (indicates the difference, expressed in quarter of an hour, Between the local time and GMT; two last digits are mandatory), range is -47..+48
AT+CCLK?	Read command returns the current setting of the real-time clock, in the format **<time>.** Note: the three last characters of **<time>**, i.e. the time zone information, are returned by **+CCLK?** Only if the **#NITZ** URC 'extended' format has been enabled (see **#NITZ**).
AT+CCLK=?	Test command returns the **OK** result code.
Example	AT+CCLK="15/04/07,22:30:00+00" OK AT+CCLK? +CCLK: "02/09/07,22:30:25" OK
Reference	3GPP TS 27.007

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

5.4.4.13. Setting time format - +CSTF

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

5.4.4.14. Time Zone reporting - +CTZR

+CTZR – Time Zone reporting	
AT+CTZR=<reporting>	This command enables and disables the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV:<tz> , or +CTZE: <tz>,<dst>,[<time>] whenever the time zone is changed. Parameters: **<reporting>:** 0 Disable time zone change event reporting (default) 1 Enable time zone change event reporting by unsolicited result code +CTZV: <tz> 2 Enable extended time zone reporting by unsolicited result code +CTZE: <tz>,<dst>,[<time>] **<tz>:** sum of the local time zone **<dst>:** 0 <tz> includes no adjustment for Daylight Saving Time

+CTZR – Time Zone reporting	
	1 <tz> includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight saving time
	2 <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time
	<time>: string type value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss". This parameter can be provided by the network.
AT+CTZR?	Read command reports the currently selected **<reporting>** in the format: **+CTZR: <reporting>**
AT+CTZR=?	Test command reports the supported range of values for parameter **<reporting>**

5.4.4.15. Automatic Time Zone update - +CTZU

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

5.4.4.16. Restricted SIM Access - +CRSM

+CRSM - Restricted SIM Access	
AT+CRSM=	Execution command transmits to the **ME** the SIM **<command>** and its required parameters. **ME** handles internally all **SIM-ME**

+CRSM - Restricted SIM Access	

<command>
 	
[,<fileid>
 	
[,<P1>,<P2>,<P3>
 	
[,<data>[,<pathid>]]]]
	interface locking and file selection routines. As response to the command, **ME** sends the actual SIM information parameters and response data.
	
	Parameters:
	<command> - command passed on by the **ME** to the SIM
	  176 - READ BINARY
	  178 - READ RECORD
	  192 - GET RESPONSE
	  214 - UPDATE BINARY
	  220 - UPDATE RECORD
	  242 - STATUS
	
	<fileid> - identifier of an elementary data file on SIM. Mandatory for every command except STATUS.
	
	<P1>,**<P2>**,**<P3>** - parameter passed on by the ME to the SIM; they are mandatory for every command except GET RESPONSE and STATUS
	  0..255
	
	<data> - information to be read/written to the SIM (hexadecimal character format).
	
	<pathid> - string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format. The <pathid> shall only be used in the mode "select by path from MF" (e.g. "7F205F70").
	The response of the command is in the format:
	
	+CRSM: <sw1>,<sw2>[,<response>]
	
	where:
	<sw1>,**<sw2>** - information from the SIM about the execution of the actual command either on successful or on failed execution.
	<response> - on a successful completion of the command previously issued it gives the requested data (hexadecimal character format). It's not returned after a successful UPDATE BINARY or UPDATE RECORD command.
	
	Note: this command requires PIN authentication. However commands READ BINARY and READ RECORD can be issued before PIN authentication and if the SIM is blocked (after three failed PIN authentication attempts) to access the contents of the Elementary Files.
	
	Note: use only decimal numbers for parameters **<command>**, **<fileid>**, **<P1>**, **<P2>** and **<P3>**.

AT+CRSM=?	Test command returns the **OK** result code

+CRSM - Restricted SIM Access	
Example	Read binary, ICCID(2FE2)
	AT+CRSM=176,12258,0,0,10
	+CRSM: 144,0,982850702001107686F4
	OK
	Read record, ADN(6F3A)
	AT+CRSM=178,28474,1,4,40
	+CRSM: 144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFFFF0681105678
	9282FFFFFFFFFFFFFF
	OK
	Update Binary, KcGPRS(6F52)
	AT+CRSM=214,28498,0,0,7,C69018C7958C87
	+CRSM: 144,0
	OK
	Update Record, ADN(6F3A)
	AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
	+CRSM: 144,0
	OK
	Status, FPLMN(6F7B)
	AT+CRSM=242,28539
	+CRSM: 144,0,623C820238218410A0000000871002FFFFFFFFF8904
	0300FFA5118001318103010A3282011E8304000030E08A01058B032F0609C6099001C0830101830181
	OK
	Get Response, MSISDN(6F40)

+CRSM - Restricted SIM Access	
	AT+CRSM=192,28480,4,0,4,,7F106F40
	+CRSM: 144,0,621E820542210026028 3026F40A5039201008A 01058B036F06058002004C8800
	OK
Reference	3GPP TS 27.007, 3GPP TS 11.11/51.011

5.4.4.17. Generic SIM Acess - +CSIM

+CSIM – Generic SIM Access	
AT+CSIM=<lock>	This command is used to lock to a direct control of the SIM by a distant application on the TE. Parameters: **<lock>** 1 - locking of +CSIM command 0 - unlocking of +CSIM command In case that TE application does not use the unlock command in a certain timeout value, ME releases the locking.
AT+CSIM=<length>, <command>	This command allows a direct control of the SIM by a distant application on the TE Set command transmits to the MT the <command> it then shall send as it is to the SIM The <response> is Returned in the same manner to the TE Parameters: **<length>** integer type; length of the characters that are sent to TE in <command> **<command>** command passed on by MT to SIM in hex format code (e.g. "A0A4..........") Response syntax: **+CSIM**: <length>,**<response>** Where:

+CSIM – Generic SIM Access	
	<length> integer type; length of the characters that are sent to TE in <response>
	<response> response to the command passed on by the SIM to the MT

	Error case:
	+CME ERROR: <err>
	possible <err> values (numeric format followed by verbose format):
	  3 operation not allowed *(operation mode is not allowed by the ME)*
	  4 operation not supported *(wrong format or parameters of the command)*
	  13 SIM failure *(SIM no response)*

AT+CSIM=?	Test command returns the OK result code.
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011
Example	**2G SIM (TS 11.11):** *STATUS* AT+CSIM=10,A0F2000016 +CSIM:48,"000002A87F20020000000000099300220800838A838A9000" OK *SELECT EF 6F07* AT+CSIM=14,A0A40000026F07 +CSIM: 4,"9F0F" OK *GET RESPONSE* AT+CSIM=10,A0C000000F +CSIM: 34,"000000096F0704001A001A010200009000" OK *SELECT EF 6F30* AT+CSIM=14,A0A40000026F30 +CSIM: 4,"9F0F" OK *READ BINARY* AT+CSIM=10,A0B00000FC +CSIM:508,"FFFFFF13008313009013005413003013006513003813008013018013000113110913013013009813007713005913

+CSIM – Generic SIM Access	
	0043130081130095130140130023130016330420130041FFFFFF FFFFFFF21436542F41922F28822F201FFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF9000" OK **3G UICC (3G TS 31.101):** *STATUS* AT+CSIM=10,A0F2000016 +CME ERROR: operation not supported *STATUS* AT+CSIM=10,80F2000016 +CSIM:134,"623F8202782183027FF08410A0000000871002FF FFFFFFF89060400FFA507800171830284828A01058B032F0602 C61290017883010183010A83010B83010E8301819000" OK *SELECT EF 6F07 No Data Returned* AT+CSIM=18,00A4080C047F206F07 +CSIM: 4,"9000" OK *SELECT EF 6F30 Return FCP Template* AT+CSIM=18,00A40804047F206F30 +CSIM:68,"621E8202412183026F30A506C00140DE01008A010 58B036F060480 02006988009000" OK *READ BINARY* AT+CSIM=10,00B0000069 +CSIM:214,"02F81012F47022F83082F63082F64022F60192F3 1412F60313006132F40102F20162F21032F23002F60182F4101 2F91042F41902F46102F40242F22092F52072F22062F03062F 86032F01032F11042F01032F80217F60127F42027F43027F440 27F24337F62037F0209000" OK
Note	For the following instructions (value of the second byte): A4 : SELECT

+CSIM – Generic SIM Access	
	10 : TERMINAL PROFILE C2 : ENVELOPE 14 : TERMINAL RESPONSE A2 : SEEK the value of the fifth byte of **<command>** must be equal to the number of bytes which follow (data starting from 6th byte) and this must be equal to **<length>**/2 – 5 otherwise the command is not send to the SIM and CME_ERROR=4 is returned.

5.4.4.18. Accumulated Call Meter - +CACM

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

5.4.4.19. 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 consumed by the subscriber. When ACM reaches **<acmmax>** value further calls are prohibited.

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

5.4.4.20. 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 **+CACM** and **+CAMM**) into currency units.
	Parameters:
	<currency> - string type; three-character currency code (e.g. "LIT", "L. ", "USD", "DEM" etc..); used character set should be the one selected with command **+CSCS**.
	<ppu> - price per unit, string type (dot is used as decimal separator) e.g. "1989.27"
	<pwd> - SIM PIN2; if PIN2 has been already input once after startup, it is required no more
AT+CPUC?	Read command reports the current values of **<currency>** and **<ppu>** parameters in the format:

+CPUC - Price Per Unit And Currency Table	
	+CPUC : \<currency\>,**\<ppu\>**
AT+CPUC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.21. Open Logical Channel - +CCHO

+CCHO – Open Logical Channel	

AT+CCHO=\<dfname\>	Execution of the command causes the MT to return **\<sessionid\>** to allow the TE to identify a channel that is being allocated by currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical channel; select the application identified by the **\<dfname\>** received with this command and return a session Id as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel. This **\<sessionid\>** is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or Generic UICC Logical Channel access +CGLA commands.
	
	 Parameter:
	 \<dfname\> - all selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes.
	
	 The response of the command is in the format:
	 +CCHO: \<sessionid\>
	
	 where:
	 \<sessionid \> - integer type; a session ID to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism. It is to be used when sending commands with +CGLA commands.
	
	 See 3GPP TS 31.101 for more information about defined values.
	
	 Error case:
	 +CME ERROR:
	 possible \<err\> values (numeric format followed by verbose format):
	
	  3 operation not allowed (operation mode is not allowed by the ME)
	
	  4 operation not supported (wrong format or parameters of the command)
	
	  13 SIM failure (SIM response SW1 SW2 status byte Error)

+CCHO – Open Logical Channel	
	15 SIM wrong (SIM response SW1 SW2 status byte Error)
	21 invalid index (not correspond to an opened channel)
	100 unknown (generic error)
	Note: The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 for further information on logical channels in APDU commands protocol.
AT+CCHO=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.007

5.4.4.22. Close Logical Channel - +CCHC

+CCHC – Close Logical Channel	
AT+CCHC=<sessioni d>	This command asks the ME to close a communication session with the UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command. Parameter: **< sessionid >** - A session ID to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism. Error case: **+CME ERROR:** possible <err> values (numeric format followed by verbose format): 3 operation not allowed (operation mode is not allowed by the ME) 4 operation not supported (wrong format or parameters of the command) 13 SIM failure (SIM response SW1 SW2 status byte Error) 15 SIM wrong (SIM response SW1 SW2 status byte Error) 21 invalid index (not correspond to an opened channel) 100 unknown (generic error)
AT+CCHC=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.007

+CGLA – Generic UICC Logical Channel Access	
AT+CGLA=<sessioni d>,<length>,<comm and>	Set command transmits to the MT the it then shall send as it is to the selected UICC. In the same manner the UICC shall be sent back by the MT to the TA as it is.
	This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS.
	Parameter: :
	<sessionid> - integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0")
	<length> - integer type; length of the characters that are sent to TE in or (two times the actual length of the command or response) : command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format; refer +CSCS)
	The response of the command is in the format:
	+CGLA: <length>,<response>
	where:
	<response> - response to the command passed on by the SIM to the ME in the format as described in GSM TS 11.11 or 3G TS 31.101 (hexadecimal character format).
	See 3GPP TS 31.101 for more information about defined values.
	Error case:
	+CME ERROR:
	possible <err> values (numeric format followed by verbose format):
	3 operation not allowed (operation mode is not allowed by the ME)
	4 operation not supported (wrong format or parameters of the command)
	13 SIM failure (SIM response SW1 SW2 status byte Error)

+CGLA – Generic UICC Logical Channel Access	
	15 SIM wrong (SIM response SW1 SW2 status byte Error)
	21 invalid index (not correspond to an opened channel)
	100 unknown (generic error)
	Note: When the SW1 SW2 bytes received from UICC in response to **\<command\>** are "61 XX", MT automatically send to UICC a GET RESPONSE command with length "XX" and the +CGLA **\<response\>** is that retuned by GET RESPONSE command.
AT+CGLA=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.007

5.4.4.24. UICC Application Discovery - +CUAD

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

5.4.4.25. Remaining PIN retries - +CPINR

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

+CPINR – Remaining PIN retries	
	description of command +CPIN, <code> parameter, except 'READY', 'PH-SIM PIN')
	The response format is:
	+CPINR: <code>,<retries>[,<default_retries>][<CR><LF>
	+CPINR: <code>,<retries>[,<default_retries>][…]]
	where:
	<code> - string type. Type of PIN.
	<retries> - integer type. Number of remaining retries per PIN.
	<default_retries> - integer type. Number of default/initial retries per PIN.
	Note : PH-PUK states is not allowed unblock procedure, forward.
AT+CPINR=?	Test command returns the OK result code.
Example	AT+CPINR="SIM*"
	+CPINR: SIM PIN,3,3
	+CPINR: SIM PUK,10,10
	+CPINR: SIM PIN2,3,3
	+CPINR: SIM PUK2,10,10
	OK
	AT+CPINR="*SIM*" // will additionally return the lines:
	+CPINR: PH-FSIM PIN,10,10
	+CPINR: PH-FSIM PUK,0,0
	OK
Reference	3GPP TS 27.007

5.4.4.26. 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)

+CSVM – Set Voice Mail Number	

	<number> - string type phone number of format specified by **<type>**
	 <type> - type of address octet in integer format
	
	  129 - unknown type of number and ISDN/Telephony numbering plan
	
	  145 - international type of number and ISDN/Telephony numbering plan (contains the character "+")

AT+CSVM?	Read command returns the currently selected voice mail number and the status (i.e. enabled/disabled) in the format **+CSVM:<mode>,<number>,<type>**
AT+CSVM=?	Test command reports the range for the parameters **<mode>** and **<type>**.
Note	If the SIM supports the Voice mail number, <number> is stored in SIM.
Reference	3GPP TS 27.007

5.4.4.27. Available AT Commands - +CLAC

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

5.4.4.28. Primary Notification Event Reporting- +CPNER

+CPNER – Primary Notification Event Reporting	
AT+CPNER= [<reporting>]	Set command enables and disables reporting of primary notification events when received from the network with unsolicited result code **+CPNERU: (see format below)**. Primary notification events used for public warning systems like ETWS (Earthquake and Tsunami Warning Systems). Parameter: **<reporting>** - integer type, controlling reporting of primary notification events.

+CPNER – Primary Notification Event Reporting	
	0 - Disable primary notification events.
	1 - Enable reporting of primary notification events without security information, unsolicited result code(default)
	+CPNERU: **<message_identifier>,<serial_number>,<warning_type>**
	<message_identifier> string type in hexadecimal character format. The parameter contains the message identifier (2 bytes) of the primary notification.
	<serial_number> string type in hexadecimal character format. The parameter contains the serial number (2 bytes) of the primary notification.
	<warning_type> string type in hexadecimal character format. The parameter contains the warning type (2 bytes) of the primary notification.
AT+CPNER?	Read command reports the current value of the parameter <reporting>.
AT+CPNER=?	Test command returns supported of <reporting> parameter.
Example	AT+CPNER? +CPNER: 1 OK
Reference	3GPP TS 27.007

5.4.4.29. Extended Signal Quality - +CESQ

+CESQ – Extended Signal Quality	
AT+CESQ	Execution command reports received signal quality parameters in the form: **+CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>** Where **< rxlev >** - received received signal strength level (see 3GPP TS 45.008 subclause 8.1.4). 0 - rssi < -110 dBm

+CESQ – Extended Signal Quality	
	1 - -110 dBm ≤ rssi < -109 dBm
	2 - -109 dBm ≤ rssi < -108 dBm
	...
	61 - -50 dBm ≤ rssi < -49 dBm
	62 - -49 dBm ≤ rssi < -48 dBm
	63 - -48 dBm ≤ rssi
	99 - not known or not detectable or if the current serving cell is not a GERAN cell
	<ber> - bit error rate (in percent)
	0...7 - as RXQUAL values in the table in 3GPP TS 45.008 subclause 8.2.4
	99 - not known or not detectable or if the current serving cell is not a GERAN cell
	<rscp> - received signal code power (see 3GPP TS 25.133 subclause 9.1.1.3 and 3GPP TS 25.123 subclause 9.1.1.1.3). 0 - rscp < -120 dBm
	1 - -120 dBm ≤ rscp < -119 dBm
	2 - -119 dBm ≤ rscp < -118 dBm
	...
	94 - -27 dBm ≤ rscp < -26 dBm
	95 - -26 dBm ≤ rscp < -25 dBm
	96 - -25 dBm ≤ rscp
	255 - not known or not detectable or if the current serving cell is not a UTRA cell
	<ecno> - ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 subclause). 0 - Ec/Io < -24 dB
	1 - -24 dB ≤ Ec/Io < -23.5 dB
	2 - -23.5 dB ≤ Ec/Io < -23 dB
	...
	47 - -1 dB ≤ Ec/Io < -0.5 dB
	48 - -0.5 dB ≤ Ec/Io < 0 dB
	49 - 0 dB ≤ Ec/Io

+CESQ – Extended Signal Quality	
	255 - not known or not detectable detectable or if the current serving cell is not a UTRA cell
	<rsrq> - reference signal received quality (see 3GPP TS 36.133 subclause 9.1.7). 0 - rsrq < -19.5 dB
	1 - -19.5 dB ≤ rsrq < -19 dB
	2 - -19 dB ≤ rsrq < -18.5 dB
	...
	32 - -4 dB ≤ rsrq < -3.5 dB
	33 - -3.5 dB ≤ rsrq < -3 dB
	34 - -3 dB ≤ rsrq
	255 - not known or not detectable detectable or if the current serving cell is not a EUTRA cell
	<rsrp> - type, reference signal received power (see 3GPP TS 36.133 subclause 9.1.4). 0 - rsrp < -140 dBm
	1 - -140 dBm ≤ rsrp < -139 dBm
	2 - -139 dBm ≤ rsrp < -138 dBm
	...
	95 - -46 dBm ≤ rsrp < -45 dBm
	96 - -45 dBm ≤ rsrp < -44 dBm
	97 - -44 dBm ≤ rsrp
	255 - not known or not detectable detectable or if the current serving cell is not a EUTRA cell
	Note: 4G/3G only products like LM940 does not support GSM access technology.
AT+CESQ=?	Test command returns the supported range of values of the parameters **<rxlev>, <ber>, <rscp>, <ecno>, <rsrq>, <rsrp>.**
Reference	3GPP TS 27.007

5.4.5.　　　Mobile Equipment Errors

5.4.5.1. Report Mobile Equipment Error - +CMEE

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

5.4.6. Commands For Packet Domain

5.4.6.1. GPRS Mobile Station Class - +CGCLASS

+CGCLASS – GPRS Mobile Station Class	

AT+CGCLASS=[< class>]	Set command is used to set the MT to operate according to the specified mode of operation.
	
	Parameter:
	<class>
	  "A" – Class-A mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode) (factory default)
	  "B" – Class-B mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode)
	  "CG" – Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode)
	
	  "CC" – Class-C mode of operation in CS only mode (A/Gb mode), or CS (Iu mode)
	
	  Note: the setting is saved in NVM(and available on following reboot).

AT+CGCLASS?	Read command returns the mode of operation set by the TE. format: **+CGCLASS: <class>**
AT+CGCLASS=?	Test command reports the range for the parameter **<class>**.
Reference	3GPP TS 27.007

5.4.6.2. PS Attach Or Detach - +CGATT

+CGATT - PS attach or detach	

AT+CGATT= [<state>]	Execution command is used to attach the terminal to, or detach the terminal from, the PS service depending on the parameter **<state>**.
	
	Parameter:
	<state> - state of PS attachment
	  0 - detached
	  1 – attached

AT+CGATT?	Read command returns the current service state.
AT+CGATT=?	Test command requests information on the supported service states.

+CGATT - PS attach or detach	
Example	AT+CGATT? +CGATT: 0 OK AT+CGATT=? +CGATT: (0,1) OK AT+CGATT=1 OK
Reference	3GPP TS 27.007

5.4.6.3. Packet domain Event Reporting - +CGEREP

+CGEREP – Packet domain Event Reporting	

AT+CGEREP=
 	
[<mode>
 	
[,<bfr>]]
	Set command enables or disables sending of unsolicited result codes **+CGEV: XXX** (see below) from **TA** to **TE** in the case of certain events occurring in the **TA** or the network.
	
	Parameters:
	
	<mode> - controls the processing of **URCs** specified with this command.
	
	  0 - Buffer unsolicited result codes in the TA. If TA result code buffer is full, the oldest one can be discarded. No codes are forwarded to the TE.
	  1 - Discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.
	  2 - Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when TA-TE link becomes available, otherwise forward them directly to the TE.
	<bfr> - controls the effect on buffered codes when <mode> 1 or 2 is entered:
	  0 - TA buffer of unsolicited result codes defined within this command is cleared when <mode>=1 or 2 is entered.
	  1 - TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered (OK response shall be given before flushing the codes).
	
	Unsolicited Result Codes
	
	The following unsolicited result codes and the corresponding events are defined:
	
	+CGEV: REJECT <PDP_type>, <PDP_addr>
	
	  A network request for PDP context activation occurred when

+CGEREP – Packet domain Event Reporting	
	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 PS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME DETACH** The mobile equipment has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME CLASS <class>** The mobile equipment has forced a change of MS class. The highest available class is reported (see **+CGCLASS**)
AT+ CGEREP?	Read command returns the current <mode> and <bfr> settings, in the format: **+CGEREP: <mode>,<bfr>**
AT+ CGEREP=?	Test command reports the supported range of values for the **+CGEREP** command parameters.
Example	AT+CGEREP=? +CGEREP: (0-2),(0,1)

+CGEREP – Packet domain Event Reporting	
Reference	3GPP TS 27.007

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

+CGREG - GPRS Network Registration Status

	<rac>: string type; one byte routing area code(2G, 3G) or Mobile Management Entity code(4G) in hexadecimal format Note: **<lac>, <ci>, <AcT>** and **<rac>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CGREG?	Read command returns the status of result code presentation mode **<n>** and the integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format: **+CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]]** **Note**: **<lac>, <ci>, <AcT>** and **<rac>** are reported only if **<mode>=2** and the mobile is registered on some network cell. **Note:** 4G/3G only products like LM940 does not support GSM access technology. **Note**: **<lac>** and**<rac>** values will change **<tac>** and **<mme_code>** values in LTE.
AT+CGREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

5.4.6.5. Printing IP Address - +CGPIAF

+CGPIAF Printing IP Address Format

AT+CGPIAF = [<IPv6_AddressFormat> [,<IPv6_SubnetNotation> [,<IPv6_leadingZeros> [,<IPv6_compressZeros>]]]]	**Description:** Set command decides what the format to print IPv6 address parameter. Parameters: **<IPv6_AddressFormat>** - decides the IPv6 address format. Relevant for all AT command parameters, that can hold an IPv6 address. 0 – Use IPv4-like dot-notation. IP addresses, and subnetwork mask if applicable, are dot-separated. 1 – Use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space. **<IPv6_SubnetNotation>** - decides the subnet-notation for <remote address and subnet mask> Setting does not apply if IPv6 address format <IPv6_AddressFormat> = 0. 0 – Both IP address, and subnet mask are started explicitly, separated by a space. 1 – The printout format is applying /(forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation. **<IPv6_LeadingZeros>** - decides whether leading zeros are omitted or not. Setting does not apply if IPv6 address format <IPv6_AddressFormat> = 0. 0 – Leading zeros are omitted. 1 – Leading zeros are included. **<IPv6_CompressZeros>** - decides whether 1-n instances of 16-bit- zero-values are replaced by only ":". This applies only once. Setting does not apply if IPv6 address format <IPv6_AddressFormat> = 0. 0 – No zero compression. 1 – Use zero compression.
AT+CGPIAF?	Read command returns the current parameter setting.
AT+CGPIAF=?	Test command returns values supported as compound parameter setting.
Example	AT+CGPIAF=0,0,0,0 OK AT+CGACT=1,1 OK AT+CGPADDR = +CGPADDR: 1,"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+CGACT=1,1
	OK
	AT+CGPADDR =
	+CGPADDR: 1," FC01:ABAB:CDCD:EFE0:0:0:0:1"
	OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.6.6. Define PDP Context - +CGDCONT

+CGDCONT - Define PDP Context	
+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]]]]]]]	Set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, **<cid>** Parameters: **<cid>** - (PDP Context Identifier) numeric parameter which specifies a particular PDP context definition. 1..*max* - where the value of *max* is returned by the Test command **<PDP_type>** - (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol "IP" - Internet Protocol "PPP" - Point to Point Protocol "IPV6" - Internet Protocol version 6 "IPV4V6" - Virtual <PDP_type> introduced to handle dual IP stack UE capability **NOTE : Only IP, IPV6 and IPV4V6 values are supported for EPS(LTE) services.** **<APN>** - (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is empty (**""**) or omitted, then the subscription value will be requested. **<PDP_addr>** - a string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the **+CGPADDR** command.When **+CGPIAF** is supported, it's settings can influence the format of this parameterreturned with the read form of **+CGDCONT**. **NOTE : For EPS(LTE), this field is omitted.** **<d_comp>** - a numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065 [61])

	0 - off (default)
	1 - on
	2 - V.42bis
	<h_comp> - numeric parameter that controls PDP header compression.
	0 - off (default)
	1 - on (manufacturer preferred compression)
	2 - RFC1144 (applicable for SNDCP only)
	3 - RFC2507
	4 - RFC3095 (applicable for PDCP only)
	<IPv4AddrAlloc> - integer type; controls how the MT/TA requests to get the IPv4 address information
	0 - (default) IPv4 address allocation through NAS signalling
	1 - IPv4 address allocated through DHCP
	<**emergency indication**> - a numeric parameter used to indicate whether the PDP context is for emergencybearer services or not.
	0 - (default) PDP context is not for emergency bearer services
	1 - PDP context is for emergency bearer services
	<**P-CSCF_discovery**> - a numeric parameter influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.
	0 - (default) Preference of P-CSCF address discovery not influenced by +CGDCONT
	1 - Preference of P-CSCF address discovery through NAS Signalling
	2 - Preference of P-CSCF address discovery through DHCP
	<**IM_CN_Signalling_Flag_Ind**>: a numeric parameter used to indicate to
	the network whether the PDPcontext is for IM CN subsystem-related
	signalling only or not.
	0 - (default) UE indicates that the PDP context is not for IM CN subsystem-related signalling only
	1 - UE indicates that the PDP context is for IM CN subsystem-related signalling only
	Note: a special form of the Set command, **+CGDCONT=<cid>**, causes the values for context number **<cid>** to become undefined.

+CGDCONT - Define PDP Context	
	Note : if emergence indication is enabled, this profile can not be used attached profile.
AT+CGDCONT?	Read command returns the current settings for each defined context in the format: **+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]][<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4Add** **rAlloc>[,<emergency indication>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]][...]]**
AT+CGDCONT=?	Test command returns values supported as a compound value.

Example	AT+CGDCONT=1,"IP","APN","10.10.10.10",0,0,0,0,0.0
	OK
	AT+CGDCONT?
	+CGDCONT: 1,"IP","APN","10.10.10.10",0,0,0,0,0,0
	
	    OK
	AT+CGDCONT=?
	+CGDCONT: (1-16),"IP",,,(0-2),(0-4),(0,1),(0,1),(0-2),(0,1)
	+CGDCONT: (1-16),"PPP",,,(0-2),(0-4),(0,1),(0,1),(0-2),(0,1)
	+CGDCONT: (1-16),"IPV6",,,(0-2),(0-4),(0,1),(0,1),(0-2),(0,1)
	+CGDCONT: (1-16),"IPV4V6",,,(0-2),(0-4),(0,1),(0,1),(0-2),(0,1)
	
	    OK

Reference	3GPP TS 27.007

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

+CGQMIN – Quality Of Service Profile (Minimum Acceptable)	
AT+CGQMIN= [<cid> [,<precedence>	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:**

[,<delay> [,<reliability> [,<peak> [,<mean>]]]]]]	**<cid>** - PDP context identification (see **+CGDCONT** command). **<precedence>** - precedence class 0 - 3 (default 0) **<delay>** - delay class 0 - 4 (default 0) **<reliability>** - reliability class 0 - 5 (default 0) **<peak>** - peak throughput class 0 - 9 (default 0) **<mean>** - mean throughput class 0 ~ 18, 31 (default 0) If a value omitted for a particular class then this class is not checked. Note**:** a special form of the Set command, **+CGQMIN=<cid>** causes the requested profile for context number **<cid>** to become undefined. If no PDP context defined, it has no effect and **OK** result code returned.
AT+CGQMIN?	Read command returns the current settings for each defined context in the format: **+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,** **<mean>[<CR><LF>+CGQMIN: <cid>,<precedence>,** **<delay>,<reliability>,<peak>,<mean>[…]]** If no PDP context has been defined, it has no effect and **OK** result code is returned
AT+CGQMIN=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQMIN: <PDP_Type>,(list of supported <precedence>s),** **(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s)**
Example	AT+CGQMIN? +CGQMIN: 1,0,0,0,0,0 AT+CGQMIN=1,0,0,3,0,0

	OK
	OK
	AT+CGQMIN=?
	+CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
	+CGQMIN: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
	+CGQMIN: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31)
	+CGQMIN: "IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31)
	OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

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

+CGQREQ – Quality Of Service Profile (Requested)	
AT+CGQREQ= [**<cid>** [,**<precedence>** [,**<delay>** [,**<reliability>** [,**<peak>** [,**<mean>**]]]]]]	Set command allows specify Quality of Service Profile that used when the terminal sends an Activate PDP Context Request message to the network. It specifies a profile for the context identified by the (local) context identification parameter, **<cid>**.
	Parameters:
	<cid> - PDP context identification (see **+CGDCONT** command).
	<precedence> - precedence class
	0 - 3 (default 0)
	<delay> - delay class
	0 - 4 (default 0)
	<reliability> - reliability class
	0 - 5 (default 0)
	<peak> - peak throughput class
	0 - 9 (default 0)
	<mean> - mean throughput class
	0 - 18, 31 (default 0)
	If a value omitted for a particular class then this class is not checked.
	Note**:** a special form of the Set command, **+CGQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined.

AT+CGQREQ?	Read command returns the current settings for each defined context in the format: **+CGQREQ: \<cid\>,\<precedence\>,\<delay\>,\<reliability\>,\<peak\>,** **\<mean\>[\<CR\>\<LF\>+CGQREQ: \<cid\>,\<precedence\>,** **\<delay\>,\<reliability\>,\<peak\>,\<mean\>[…]]** If no PDP context defined, it has no effect and **OK** result code returned.
AT+CGQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQREQ: \<PDP_Type\>,(list of supported \<precedence\>s),** **(list of supported \<delay\>s),(list of supported \<reliability\>s),(list of supported \<peak\>s),(list of supported \<mean\>s)**
Example	AT+CGQREQ? +CGQREQ: 1,0,0,0,0,0 OK AT+CGQREQ=1,0,0,3,0,0 OK AT+CGQREQ=? +CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.6.9. 3G Quality Of Service Profile (Requested) - +CGEQREQ

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
AT+CGEQREQ= **[\<cid\>** **[,\<Traffic class\>** **[,\<Maximum**	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter \<cid\>

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>]]]]]]]]]]]]]]	which is used when the MT sends an Activate PDP Context Request message to the network.
	
	Parameters:
	
	<cid> - PDP context identification (see **+CGDCONT** command).
	
	<Traffic class> - Traffic class
	  0 - conversational
	  1 - streaming
	  2 - interactive
	  3 - background
	  4 - subscribed value (default value)
	
	<Maximum bitrate UL> - Maximum bitrate Up Link (kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming.
	  0 - subscribed value (default value)
	  1 - 568
	  576 - 11520
	
	<Maximum bitrate DL> - Maximum bitrate down link (kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming.
	  0 - subscribed value (default value)
	  1 - 568
	  576 - 8640
	  8700 - 42200
	
	<Guaranteed bitrate UL> - the guaranteed bitrate up link(kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming.
	  0 - subscribed value (default value)
	  1 - 568
	  576 - 11520
	
	<Guaranteed bitrate DL> - the guaranteed bitrate down link(kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming.
	  0 - subscribed value (default value)

	1 - 568
	576 - 8640
	8700 - 42200
	\<Delivery order\> - SDU Delivery order
	0 - no
	1 – yes
	2 – subscribed value (default value)
	\<Maximum SDU size\> - Maximum SDU size in octets
	0 - subscribed value (default value)
	10 - 1500
	1502
	1510
	1520
	\<SDU error ratio\> - SDU error ratio - mEe mean m*10-e ,
	for example 1E2 mean 1*10-2
	"0E0" (default value)
	"1E1"
	"1E2"
	"7E3"
	"1E3"
	"1E4"
	"1E5"
	"1E6"
	\<Residual bit error ratio\> - Residual bitt error ratio
	- mEe mean m*10-e , for example 1E2 mean 1*10-2
	"0E0" (default value)
	"5E2"
	"1E2"
	"5E3"
	"4E3"
	"1E3"
	"1E4"
	"1E5"

"1E6"

"6E8"

<Delivery of erroneous SDUs> - Delivery of erroneous SDUs

  0 - no

  1 - yes

  2 - no detect

  3 - subscribed value (default value)

<Transfer delay > - Transfer delay (milliseconds)

  0 - subscribed value (default value)

  10 - 150

  200 - 950

  1000 - 4000

<Traffic handling priority > - Traffic handling priority

  0 - subscribed value (default value)

  1 - 3

<Source Statistics Descriptor> - Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming.

  0 - Characteristics of SDUs is unknown (default value)
  1 - Characteristics of SDUs corresponds to a speech source

<Signalling Indication> - Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the **<Traffic class>** is specified as interactive.

  0 - PDP context is not optimized for signalling (default value)
  1 - PDP context is optimized for signalling **<PDP_type>**

    (see **+CGDCONT** command).

Note: a special form of the Set command, **+CGEQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined.

Note: the current settings are stored in NVM.

Note: set command can modify the 2G QoS according to 3GPP 23.107 (see **+CGQREQ**).

AT+CGEQREQ?	Read command returns the current settings for each defined context in the format:
	[+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>,<Source statistics descriptor>,<Signalling indication><CR><LF>] **[+CGEQREQ:…]** If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGEQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQEQREQ: <PDP_Type>,(list of supported <Traffic class>s),** **(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s), (list of supported <Source statistics descriptor>s), (list of supported <Signalling indication>s)**
Example	AT+CGEQREQ=1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0 OK AT+CGEQREQ? +CGEQREQ: 1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0,0,0 OK AT+CGEQREQ=? **+CGEQREQ:** "IP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200), (0-568,576-11520), (0-568,576-8640,8700-42200),(0-2),(0.10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQREQ**: "PPP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-

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

5.4.6.10. 3G Quality Of Service Profile (Minimum Acceptable) - +CGEQMIN

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	

AT+CGEQMIN= [<cid> [,<Traffic class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio>	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept Message.
	
	Parameters:
	<cid> - PDP context identification (see **+CGDCONT** command).
	<Traffic class> - Traffic class
	   0 - conversational
	   1 - streaming
	   2 - interactive
	   3 - background
	   4 - subscribed value (default value)
	
	<Maximum bitrate UL> - Maximum bitrate Up Link (kbits/s)
	   0 - subscribed value (default value)
	   1 - 568,
	   576 - 11520

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
[,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority>[,<Source statistics descriptor> [,<Signalling indication>]]]]]]]]]]]]]]	**<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s) 0 - subscribed value (default value) 1 - 568 576 - 8640, 8700 - 42200 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s) 0 - subscribed value (default value) 1 - 568 576 - 11520 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s) 0 - subscribed value (default value) 1 - 568 576 - 8640 8700 - 42200 **<Delivery order>** SDU Delivery oreder 0 - no 1 - yes 2 - subscribed value (default value) **<Maximum SDU size>** Maximum SDU size in octets 0 - subscribed value (default value) 10 - 1500 1502 1510 1520 **<SDU error ratio>** SDU error ratio - mEe mean m*10^{-e} , for example 1E2 mean 1*10^{-2} "0E0" (default value) "1E1" "1E2"

"7E3"

"1E3"

"1E4"

"1E5"

"1E6"

<Residual bit error ratio> Residual bitt error ratio

- mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$

"0E0"   (default value)

"5E2"

"1E2"

"5E3"

"4E3"

"1E3"

"1E4"

"1E5"

"1E6"

"6E8"

<Delivery of erroneous SDUs> Delivery of erroneous SDUs

0 - no

1 - yes

2 - no detect

3 - subscribed value   (default value)

<Transfer delay > Transfer delay (milliseconds)

0 - subscribed value   (default value)

10 - 150

200 - 950

1000 - 4000

<Traffic handling priority > Traffic handling priority

0 - subscribed value (default value)

1 - 3

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	<Source Statistics Descriptor> Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the <Traffic class> is specified as conversational or streaming.
	0 - Characteristics of SDUs is unknown (default value)
	1 - Characteristics of SDUs corresponds to a speech source
	<Signalling Indication> Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the <Traffic class> is specified as interactive.
	0 - PDP context is not optimized for signalling (default value)
	1 - PDP context is optimized for signalling <PDP_type>
	(see +CGDCONT command).
	Note: a special form of the Set command, **+CGEQMIN=<cid>** causes the requested profile for context number **<cid>** to become undefined.
AT+CGEQMIN?	Read command returns the current settings for each defined context in the format:
	[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>< Source Statistics Descriptor >< Signalling Indication ><CR><LF>]
	[+CGEQMIN:…]
	If no PDP context has been defined, it has no effect and **OK** result code is returned.
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

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	<Source statistics descriptor>s) ,(list of supported < Signalling indication>s)
Example	AT+CGEQMIN=1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0 OK **AT+CGEQMIN?** +CGEQMIN: 1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0 OK **AT+CGEQMIN=?** **+CGEQMIN:** "IP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQMIN:** "PPP",(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQMIN:** "IPV6(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1) **+CGEQMIN:** "IPV4V6(0-4),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-568,576-11520),(0-568,576-8640,8700-42200),(0-2),(0,10-1500,1502,1510,1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,10-150,200-950,1000-4000),(0-3),(0,1),(0,1)
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.6.11. 3G Quality of Service Profile (Negotiated) - +CGEQNEG

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
AT+CGEQNEG= **[<cid>[,<cid>[,…]]]**	This command allow the TE to retrieve the negotiated 3G quality of service profiles returned in the Activate PDP Context Accept message. 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 – 3G Quality Of Service Profile (Negotiated)	
	Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command).
AT+CGEQNEG=?	Test command returns a list of <**cid**>s associated with active contexts.
Example	AT+CGEQREQ? +CGEQREQ: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0 OK AT+CGACT=1,1 OK AT+CGEQNEG=? +CGEQREQ: (1) OK AT+CGEQNEG=1 +CGEQNEG: 1,3,128,384,0,0,2,1500,"1E4","1E5",3,0,1 OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.6.12. Set Mode of Operator for EPS - +CEMODE

+CEMODE – Set mode of operation for EPS.	

AT+CEMODE=[<mode>]	Set command configures the mode of operation for EPS
	
	Parameter:
	
	<mode>: a numeric parameter which indicates the mode of operation
	
	  0 - PS mode 2 of operation (Default value of Sprint)
	
	  1 - CS/PS mode 1 of operation
	
	  2 - CS/PS mode 2 of operation (Default value of Generic, AT&T, Verizon)
	
	  3 - PS mode 1 of operation

+CEMODE – Set mode of operation for EPS.	
	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)
Example	AT+CEMODE=1 OK AT+CEMODE? +CEMODE: 1 OK

5.4.6.13. PDP Context Activate Or Deactivate - +CGACT

+CGACT - PDP Context Activate Or Deactivate	
AT+CGACT= **[<state>[,<cid>** **[,<cid>[,…]]]]**	Execution command is used to activate or deactivate the specified PDP context(s). It is only for the testing purpose. 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)

+CGACT - PDP Context Activate Or Deactivate	
	Note: if no **<cid>**s are specified the activation/deactivation form of the command activates/deactivates all defined contexts. If any defined profile is failed during activating/deactiving, stop activating/deactivating and reponse ERROR. Note: Execute command responses Error as executing +CGACT=0 without +CGACT=1 or +CGACT=1,1.
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

5.4.6.14. Show PDP Address - +CGPADDR

+CGPADDR - Show PDP Address	
AT+CGPADDR= **[<cid>[,<cid>** **[,…]]]**	Execution command returns a list of PDP addresses for the specified context identifiers in the format: **+CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>,** **<PDP_addr>[…]]** Parameters: **<cid>** - a numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). If no **<cid>** is specified, the addresses for all defined contexts are returned. **1** – 16

+CGPADDR - Show PDP Address	
	<PDP_addr> - a string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the **+CGDCONT** command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**; **<PDP_addr>** is omitted if none is available
AT+CGPADDR=?	Test command returns a list of defined **<cid>**s.
Example	AT+CGACT=1,1 OK AT+CGACT? +CGACT: 1,1 OK AT+CGPADDR=1 +CGPADDR: 1,"xxx.yyy.zzz.www" OK AT+CGPADDR=? +CGPADDR: (1) OK AT+CGPADDR = +CGPADDR: 1,"10.76.2.254" +CGPADDR: 2,"" +CGPADDR: 3,"" OK
Reference	3GPP TS 27.007

5.4.6.15. Modify PDP Context - +CGCMOD

+CGCMOD – Modify PDP context	
AT+CGCMOD= [<cid>[,<cid> [,…]]]	The execution command is used to modify the specified PDP context (s) with repect to QoS profiles and TFTs. Possible Response(s):

+CGCMOD – Modify PDP context	
	OK
	ERROR
	If no **<cid*i*>** is specified the command modifies all active contexts. Parameters: **<cid*i*>**: a numeric parameter which specifies a particular PDP context .
AT+CGCMOD?	Read command returns ERROR.
AT+CGCMOD=?	Test command returns a list of defined **<cid>**s.
Example	+CGCMOD: (list of <cid>s associated with active contexts) AT+CGCMOD? ERROR AT+CGCMOD = OK AT+CGCMOD =? +CGCMOD: OK AT+CGACT=1,1 OK AT+CGCMOD=? +CGCMOD: (1) OK AT+CGCMOD = OK AT+CGCMOD? ERROR
Note	It is only used secondary PDP is activated.
Reference	3GPP TS 27.007

5.4.6.16. Define EPS Quality Of Service - +CGEQOS

+CGEQOS – Define EPS Quality Of Service	
AT+CGEQOS= **[<cid>** **[,<QCI>** **[,<DL_GBR>,**	This command allows the TE to specify the EPS Quality of Service parameters **<cid>**, **<QCI>**, [**<DL_GBR>** and **<UL_GBR>**] and [**<DL_MBR>** and **<UL_MBR>**] for a PDP context or Traffic Flows. When in UMTS, the MT applies a mapping function to UTMS Quality of Service.

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

AT+CGEQOS=?	The test command returns the ranges of the supported parameters.
	+CGEQOS: (range of supported <cid>s) ,(list of supported <QCI>s) ,(list of supported <DL_GBR>s), (list of supported <UL_GBR>s), (list of supported <DL_MBR>s) ,(list of supported <UL_MBR>s)
Example	AT+CGEQOS =?
	+CGEQOS: (1-16),(0-9),(0-150000),(0-50000),(0-150000),(0-50000)
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.6.17. PDP Context Read Dynamic Parameters - +CGCONTRDP

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

\<bearer_id\> - a numeric parameter identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS.

\<APN\> - a string parameter which is a logical name that was used to select the GGSN or the external packet data network.

\<ip_addr\> - a string parameter shows the IP Address of the MT. The string is given as dot-separated numeric (0-255) parameters on the form:

"a1.a2.a3.a4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8" for IPv6. If the MT has dual stack capabilities the string shows first the dot separated IPv4 Address followed by the dot Separated IPv6 Global Prefix Address. The IPv4 address and the IPv6 address parameters are separated by space: "a1.a2.a3.a4 a1:a2:a3:a4:a5:a6:a7:a8"

\<subnet_mask\> - a string parameter shows the subnet mask for the IP Address of the MT. The string given as dot-separated numeric (0-255) parameters.

If the MT has dual stack capabilities the string shows the dot separated IPV4 subnet mask followed by the dot Separates IPV6 subnet mask. The subnet masks are separates by space.

\<gw_addr\> - a string parameter shows the Gateway Address of the MT. The string is given as dot-separated

numeric (0-255) parameters.

If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Gateway address followed by the dot separated IPV6 Gateway Address. The gateway addresses are separated by space.

\<DNS_prim_addr\> - a string parameter which shows the IP Address of the primary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server.

\<DNS_sec_addr\> - a string parameter which shows the IP address of the secondary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server.

\<P_CSCF_prim_addr\> - a string parameter which shows the IP Address of the primary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 primary Address of P-CSCF Server.

	<P_CSCF_sec_addr> - a string parameter which shows the IP Address of the secondary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of P-CSCF Server.
AT+CGCONTRD P?	Read command returns ERROR.
AT+CGCONTRD P=?	**+CGCONTRDP: (list of <cid>s associated with active contexts)**
Example	AT+CGACT=1,1 OK AT+CGCONTRDP=? +CGCONTRDP: (1) AT+CGCONTRDP =1 +CGCONTRDP: 1,5,lte.ktfwing.com,"10.52.202.76",,"211.219.86.1","168.126.63.1"
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.6.18. Traffic Flow Template Read Dynamic Parameters - +CGTFTRDP

+CGTFTRDP Traffic Flow Template Read Dynamic Parameters	
AT+CGTFTRDP= **[<cid>]**	The execution command returns the relevant information about Traffic Flow Template of **<cid>** together with the additional network assigned values when established by the network. If the context can't be found, an ERROR response is returned. If the parameter **<cid>** omitted, the Traffic Flow Templates for all established PDP contexts returned. NOTE**:** The dynamic part of the PDP context will only exist if established by the network. The test command returns a list of <cid>s associated with active contexts. **Possible Response(s):** **+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header(ipv6)>,<destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label ipv6)>, <direction, <NW packet filter Identifier>[<CR><LF>**

+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>,<NW packet filter Identifier> [...]]

<cid>: a numeric parameter which specifies a particular PDP context definition or Traffic Flows definition.

The following parameters are defined in 3GPP TS 23.060 [47] -

<packet filter identifier>: a numeric parameter. The value range is from 1 to 16.

<evaluation precedence index>: a numeric parameter. The value range is from 0 to 255.

<source address and subnet mask>: string type. The string is given as dot-separated numeric (0-255)

parameters on the form:

"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 **or** "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1. m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16 " for IPv6.

<protocol number (ipv4) / next header (ipv6)>: a numeric parameter, value range from 0 to 255.

<destination port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

<source port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

<ipsec security parameter index (spi)>: numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.

<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>:

string type. The string given as dot-separated numeric (0-255) parameters on the form "t.m".

<flow label (ipv6)>: numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.

	<direction> a numeric parameter which specifies the transmission direction in which the Packet Filter shall be applied.
	
	  0 - Pre Release 7 TFT Filter (see 3GPP TS 24.008 [8], table 10.5.162)
	
	  1 - Uplink
	
	  2 - Downlink
	
	  3 - Bidirectional (Used for Uplink and Downlink)
	
	<NW packet filter Identifier> a numeric parameter. In EPS the value is assigned by the network when established
	
	  1 – 16
	
	NOTE: Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each
	
	other. The possible combinations listed on 3GPP TS 23.060 [47].

AT+CGTFTRDP=?	**+CGTFTRDP: (list of <cid>s associated with activecontexts) The test command returns a list of <cid>s associated with active contexts.**
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

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

+CGEQOSRDP EPS Quality Of Service Read Dynamic Parameters	
AT+CGEQOSRDP= **[<cid>]**	The execution command returns the Quality of Service parameters <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>]of the established PDP Context associated to the provided context identifier <cid>. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the Quality of Service parameters for all established PDP contexts are returned. **Possible Response(s):** **+CGEQOSRDP: <cid>, <QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<CR>> LF>+CGEQOSRDP: <cid>, <QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][…]]** **Defined values:** **<cid>:** a numeric parameter which specifies a particular Traffic Flows definition in EPS and a PDP Context definition in UMTS. **<QCI>:** a numeric parameter that specifies a class of EPS QoS. (see 3GPP TS 23.203 [85])

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

5.4.7. Commands For Battery Charger

5.4.7.1. Battery Charge - +CBC

+CBC - Battery Charge	

AT+CBC	Execution command returns the current Battery Charge status in the format:
	
	+CBC: <bcs>,<bcl>
	
	where:
	<bcs> - battery status
	  0 - **ME** is powered by the battery
	  1 - **ME** has a battery connected, and charger pin is being powered
	  2 - **ME** does not have a battery connected
	  3 - Recognized power fault, calls inhibited
	<bcl> - battery charge level
	  0 - battery is exhausted, or **ME** does not have a battery connected
	  25 - battery charge remained is estimated to be 25%
	  50 - battery charge remained is estimated to be 50%
	  75 - battery charge remained is estimated to be 75%
	  100 - battery is fully charged.
	
	Note: There is not charger pin. So, **<bcs>=1** will never appear.
	
	Note: without battery/power connected on **VBATT** pins or during a power fault the unit is not working, therefore values **<bcs>=2** and **<bcs>=3** will never appear.

AT+CBC=?	Test command returns parameter values supported as a compound value. **+CBC: (0-3),(0-100)** Note: although **+CBC** is an execution command, 3gpp TS 27.007 requires the Test command to be defined.
Example	AT+CBC +CBC: 0,75 OK

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

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

5.5.1. General Configuration

5.5.1.1. Select Message Service - +CSMS

+CSMS - Select Message Service	

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

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

5.5.1.2. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	
AT+CPMS= **<memr>[,<memw>** **[,<mems>]]**	Set command selects memory storages **<memr>**, **<memw>** and **<mems>** to be used for reading, writing, sending and storing SMs. Parameters: **<memr>** - memory from which messages are read and deleted "ME" – SMS memory storage in Flash (default if SIM storage is not supported) "SM" – SIM SMS memory storage (default) "SR" – Status Report message storage (in SIM EF-SMSR file exists, otherwise in the RAM non-volatile memory) Note: "SR" non-volatile memory is cleared when another SIM card is inserted. It is kept, even after a reset, while the same SIM card is inserted.

+CPMS - Preferred Message Storage	
	\<memw\> - memory to which writing and sending operations are made
	"SM" – SIM SMS memory storage (default)
	"ME" – SMS memory storage in Flash (default if SIM storage is not supported)
	\<mems\> - memory to which received SMs are preferred to be stored
	"SM" – SIM SMS memory storage (default)
	"ME" – SMS memory storage in Flash (default if SIM storage is not supported)
	The command returns the memory storage status in the format:
	+CPMS: \<usedr\>,\<totalr\>,\<usedw\>,\<totalw\>,\<useds\>,\<totals\>
	where:
	\<usedr\> - number of SMs stored into **\<memr\>**
	\<totalr\> - max number of SMs that **\<memr\>** can contain
	\<usedw\> - number of SMs stored into **\<memw\>**
	\<totalw\> max number of SMs that **\<memw\>** can contain
	\<useds\> - number of SMs stored into **\<mems\>**
	\<totals\> - max number of SMS that **\<mems\>** can contain
AT+CPMS?	Read command reports the message storage status in the format:
	+CPMS: \<memr\>,\<usedr\>,\<totalr\>,\<memw\>,\<usedw\>,\<totalw\>, \<mems\>,\<useds\>,\<totals\>
	Where **\<memr\>**, **\<memw\>** and **\<mems\>** are the selected storage memories for reading, writing and storing respectively.
AT+CPMS=?	Test command reports the supported values for parameters **\<memr\>**, **\<memw\>** and **\<mems\>**
Example	AT+CPMS? +CPMS: "ME",27, 50, "ME",27, 50, "SM",1,20 OK AT+CPMS="SM","ME","SM" +CPMS: 1,20,27, 50,1,20

+CPMS - Preferred Message Storage	
	OK AT+CPMS? +CPMS: "SM",1,20, "ME",27, 50, "SM", 1,20 OK (You have 1 out of 255 SMS SIM positions occupied)
Reference	3GPP TS 27.005

5.5.1.3. Message Format - +CMGF

+CMGF - Message Format	

AT+CMGF=
[<mode>]
	Set command selects the format of messages used with send, list, read and write commands.
	
	Parameter:
	<mode>
	
	  0 - PDU mode, as defined in 3GPP TS 23.040 and 3GPP TS 23.041 (factory default)
	  1 - text mode

AT+CMGF?	Read command reports the current value of the parameter **<mode>**.
AT+CMGF=?	Test command reports the supported value of **<mode>** parameter.
Example	AT+CMGF=1 OK
Reference	3GPP TS 27.005

5.5.2.   Message Configuration

5.5.2.1. Service Center Address - +CSCA

+CSCA -Service Center Address	
AT+CSCA= <number> [,<type>]	Set command sets the Service Center Address to be used for mobile originated SMS transmissions. Parameter: **<number>** - SC phone number in the format defined by **<type>**, string type represented in the currently selected character set (see +CSCS) **<type>** - the type of number

+CSCA -Service Center Address	
	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 will be directed.
	Note: in Text mode, this setting is used by send and write commands; in PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into the **\<pdu\>** parameter equals zero.
	Note: the current settings are stored through **+CSAS**
AT+CSCA?	Read command reports the current value with used character set (see +CSCS) of the SCA in the format: **+CSCA: \<number\>,\<type\>** Note: if SCA is not present the device reports an error message.
AT+CSCA=?	Test command returns the **OK** result code.
Example	AT+CSCA="821029190903",145 OK AT+CSCA? +CSCA: "+821029190903",145 OK
Reference	3GPP TS 27.005

5.5.2.2. Set Text Mode Parameters - +CSMP

+CSMP - Set Text Mode Parameters	
AT+CSMP= **[\<fo\>** **[,\<vp\>** **[,\<pid\>** **[,\<dcs\>]]]]**	Set command is used to select values for additional parameters for storing and sending SMs when the text mode is used (**AT+CMGF=1**) Parameters: **\<fo\>** - first octet of 3GPP TS 23.040 SMS-SUBMIT or SMS-DELIVER, in integer format (default 17, i.e. SMS-SUBMIT with

+CSMP - Set Text Mode Parameters	
	validity period in relative format). As first octet of a PDU has the following bit field description (**bit[7]bit[6]bit[5]bit[4]bit[3]bit[2]bit[1]bit[0]**):

bit[1]bit[0]: Message Type Indicator, 2-bit field describing the message type;

  [00] - SMS-DELIVER;

  [01] - SMS-SUBMIT (default) ;

bit[2]: Reject Duplicates, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[4]bit[3]: Validity Period Format, 2-bit field indicating whether or not the Validity Period field is present (default is [10]):

  [00] - Validity Period field *not present*

  [01] - Validity Period field present in *enhanced format* (i.e. quoted time-string type, see below)

  [10] - Validity Period field present in *relative format* (i.e. integer type, see below)

  [11] - Validity Period field present in *absolute format* (i.e. quoted time-string type, see below)

bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report (default is [0]);

  [0] - MS is not requesting a status report

  [1] - MS is requesting a status report

bit[6]: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[7]: Reply Path, 1-bit field indicating the request for Reply Path (default is [0]);

  [0] - Reply Path not requested

  [1] - Reply Path requested

<vp> - depending on **<fo>** setting:

  a) if **<fo>** asks for a *Not Present* Validity Period, **<vp>** can be any type and it will be not considered;

  b) if **<fo>** asks for a Validity Period in *relative format*, **<vp>** shall be integer type (default 167, i.e. 24 hours);

    0..143 - (**<vp>** + 1) x 5 minutes

    144..167 - 12 hours + ((**<vp>** - 143) x 30 minutes)

    168..196 - (**<vp>** - 166) x 1 day

    197..255 - (**<vp>** - 192) x 1 week

  c) if **<fo>** asks for a Validity Period in *absolute format*, **<vp>** shall be quoted time-string type (see **+CCLK**)

+CSMP - Set Text Mode Parameters	

	d) if **\<fo\>** asks for a Validity Period in *enhanced format*, **\<vp\>** shall be the quoted hexadecimal representation (string type) of 7 octets, as follows:
	• the first octet is the **Validity Period Functionality Indicator**, indicating the way in which the other 6 octets are used; let's consider its bit field description:
	
	bit[7]: extension bit
	  [0] - there are no more VP Functionality Indicator extension octets to follow
	
	bit[6]: Single Shot SM;
	  [0] - the SC is not required to make up to one delivery attempt
	  [1] - the SC is required to make up to one delivery attempt
	
	bit[5]bit[4]bit[3]: reserved
	  [000]
	
	bit[2]bit[1]bit[0]: Validity Period Format
	  [000] - No Validity Period specified
	  [001] - Validity Period specified as for the relative format. The following octet contains the VP value as described before; all the other octets are 0's.
	  [010] - Validity Period is relative in integer representation. The following octet contains the VP value in the range 0 to 255, representing 0 to 255 seconds; all the other octets are 0's.
	  [011] - Validity Period is relative in semi-octet representation. The following 3 octets contain the relative time in Hours, Minutes and Seconds, giving the length of the validity period counted from when the SMS-SUBMIT is received by the SC; all the other octets are 0's.
	
	\<pid\> - 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).
	
	\<dcs\> - depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme
	
	Note: the current settings are stored through **+CSAS**
	
	Note: **\<vp\>**, **\<pid\>** and **\<dcs\>** default values are loaded from first SIM *SMS Parameters* profile, if present. If it is not present, then the default values are those above indicated.

AT+CSMP?	Read command reports the current setting in the format:

+CSMP - Set Text Mode Parameters	
	+CSMP: < fo>,<vp>,<pid>,<dcs>
	Note: if the Validity Period Format (**<fo>**'s **bit[4]bit[3]**) is [00] (i.e. *Not Present*), **<vp>** is represented just as a quoted empty string ("").
AT+CSMP=?	Test command returns the **OK** result code.

Example	Set the parameters for an outgoing message with 24 hours of validity period and default properties:
	
	      AT+CSMP=17,167,0,0
	      OK
	
	Set the parameters for an outgoing message with validity period in enhanced format: the **<vp>** string actually codes 24 hours of validity period.
	
	      AT+CSMP=9,"01A80000000000"
	      OK
	
	Set the parameters for an outgoing message with validity period in enhanced format: the **<vp>** string actually codes 60 seconds of validity period.
	
	      AT+CSMP=9,"023C0000000000"
	      OK
	
	Set the parameters for an outgoing message with validity period in enhanced format: the **<vp>** string actually codes 29 hours 85 minutes 30 seconds of validity period.
	
	      AT+CSMP=9,"03925803000000"
	      OK

Reference	3GPP TS 27.005; 3GPP TS 23.040; 3GPP TS 23.038

5.5.2.3. Show Text Mode Parameters - +CSDH

+CSDH - Show Text Mode Parameters	
AT+CSDH= [<show>]	Set command controls whether detailed header information is shown in text mode (**AT+CMGF=1**) result codes. Parameter: **<show>** 0 - do not show header values defined in commands **+CSCA** and **+CSMP** (**<sca>**, **<tosca>**, **<fo>**, **<vp>**, **<pid>** and **<dcs>**) nor

+CSDH - Show Text Mode Parameters	
	\<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>** (factory default) 1 - show the values in result codes
AT+CSDH?	Read command reports the current setting in the format: **+CSDH: \<show>**
AT+CSDH=?	Test command reports the supported range of values for parameter **\<show>**
Reference	3GPP TS 27.005

5.5.2.4. Select Cell Broadcast Message Types - +CSCB

+CSCB -Select Cell Broadcast Message Types	

**AT+CSCB=
[\<mode>[,\<mids>
[,\<dcss>]]]**
	Set command selects which types of Cell Broadcast Messages are to be received by the device.
	
	Parameters:
	\<mode>
	  0 - the message types defined by **\<mids>** and **\<dcss>** are accepted (factory default)
	  1 - the message types defined by **\<mids>** and **\<dcss>** are rejected
	\<mids> - Message Identifiers, string type: all different possible combinations of the CBM message identifiers; default is empty string ("").
	\<dcss> - Data Coding Schemes, string type: all different possible combinations of CBM data coding schemes; default is empty string ("").
	
	Note: the current settings are stored through **+CSAS**

AT+CSCB?	Read command reports the current value of parameters **\<mode>**, **\<mids>** and **\<dcss>**.
AT+CSCB=?	Test command returns the range of values for parameter **\<mode>**.
Example	AT+CSCB? +CSCB: 1, "", "" OK (all CBMs are accepted, none is rejected)

+CSCB -Select Cell Broadcast Message Types	
	AT+CSCB=0,"0,1,300-315,450","0-3" OK
Reference	3GPP TS 27.005, 3GPP TS 23.041, 3GPP TS 23.038.

5.5.2.5. Save Settings - +CSAS

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

5.5.2.6. Restore Settings - +CRES

+CRES - Restore Settings	
AT+CRES **[=<profile>]**	Execution command restores message service settings saved by **+CSAS** command from either NVM or SIM. Parameter: **<profile>** 0 - it restores message service settings from NVM. 1..n - it restores message service settings from SIM. The value of n depends on the SIM and its max is 3.

+CRES - Restore Settings	
	Note: certain settings may not be supported by the SIM and therefore they are always restored from NVM, regardless the value of **<profile>**.
	Note: If parameter is omitted the command restores message service settings from NVM.
AT+CRES=?	Test command returns the possible range of values for the parameter **<profile>**.
Reference	3GPP TS 27.005

5.5.2.7. More Message to Send - +CMMS

+CMMS – More Message to Send	
AT+CMMS=[<n>]	Set command controls the continuity of SMS relay protocol link. Multiple messages can be sent much faster as link is kept open. Parameter: <n> 0 – Disable (factory default) 1 - Keep link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed and the parameter <n> is automatically reset to 0: the feature is disabled. 2 - Keep link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed but the parameter <n> remains set to 2: the feature is still enabled.
AT+CMMS?	Read command reports the current value of the parameter <n>.
AT+CMMS=?	Test command reports the supported value of <n> parameter.
Reference	3GPP TS 27.005

5.5.2.8. Select service for MO SMS services – +CGSMS

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

+CGSMS – Select service for MO SMS messages

	0 - Packet Domain
	1 - Circuit switched (factory default)
	2 - Packet Domain preferred (use circuit switched if Packet Domain is not available)
	3 - Circuit switched preferred(use Packet Domain if circuit switched not available)
	Note: If SMS transfer via Packet Domain fails, <service> parameter are automatically reset to Circuit switched.
AT+CGSMS?	Read command reports the currently selected service or service preference : **+CGSMS: <service>**
AT+CGSMS=?	Test command reports the supported range of values for parameter **<service>**
Reference	3GPP TS 27.007

5.5.3.   Message Receiving And Reading

5.5.3.1. New Message Indications To Terminal Equipment - +CNMI

+CNMI - New Message Indications To Terminal Equipment

AT+CNMI=[<mode>[,<mt> [,<bm>[,<ds> [,<bfr>]]]]]	Set command selects the behaviour of the device on how the receiving of new messages from the network is indicated to the **DTE**. Parameter: **<mode>** - unsolicited result codes buffering option 0 - Buffer unsolicited result codes in the **TA**. If **TA** result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 - Discard indication and reject new received message unsolicited result codes when **TA-TE** link is reserved, otherwise forward them directly to the **TE**. 2 - Buffer unsolicited result codes in the TA in case the **DTE** is busy and flush them to the TE after reservation. Otherwise, forward them directly to the TE.

+CNMI - New Message Indications To Terminal Equipment

3 - if **<mt>** is set to 1, the hardware ring line enabled for 1 second when a SMS is received while the module is in online data mode.
 	
<mt> - result code indication reporting for SMS-DELIVER
 	
0 - No SMS-DELIVER indications are routed to the TE and message is stored.
 	
1 - If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the following unsolicited result code:
 	
+CMTI: <memr>,<index>
 	
where:
 	
  <memr> - memory storage where the new message is stored
 	
   "SM"
 	
   "ME"
 	
  <index> - location on the memory where SMS is stored.
 	
2 - SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group) are routed directly to the TE using the following unsolicited result code:
 	
(PDU Mode)
 	
+CMT: <alpha>,<length><CR><LF><pdu>
 	
where:
 	
  <alpha> - alphanumeric representation of originator/destination number corresponding to the entry found in MT phonebook; used character set should be the one selected with command +CSCS.
 	
  <length> - PDU length
 	
  <pdu> - PDU message
 	
(TEXT Mode)
 	
+CMT:<oa>,<alpha>,<scts>*[,<tooa>,<fo>,<pid>,<dcs>, <sca>,<tosca>,<length>]*<CR><LF><data> (the information written in italics will be present depending on **+CSDH** last setting)
 	
where:
 	
  <oa> - originating address, string type converted in the currently selected character set (see +CSCS)
 	
  <alpha> - alphanumeric representation of **<oa>**; used character set should be the one selected with command +CSCS.

<scts> - arrival time of the message to the SC

<tooa>, **<tosca>** - type of number **<oa>** or **<sca>**:

129 - number in national format

145 - number in international format (contains the "**+**")

<fo> - first octet of 3GPP TS 23.040

<pid> - Protocol Identifier

<dcs> - Data Coding Scheme

<sca> - Service Centre address, string type, converted in the currently selected character set (see +CSCS)

<length> - text length

<data> - TP-User-Data

- If **<dcs>** indicates that 3GPP TS 23.038 default alphabet is used and **<fo>** indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set (bit 6 of **<fo>** is 0), each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS)
- If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used or **<fo>** indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set (bit 6 of **<fo>** is 1), each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)

Class 2 messages and messages in the message waiting indication group (stored message) result in indication as defined in **<mt>=1**.

3 - Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in **<mt>=2**. Messages of other data coding schemes result in indication as defined in **<mt>=1**.

<bm> - broadcast reporting option

0 - Cell Broadcast Messages are not sent to the **DTE**

2 - New Cell Broadcast Messages are sent to the **DTE** with the unsolicited result code:

(PDU Mode)

+CBM: <length><CR><LF><PDU>

where:

<length> - PDU length

<PDU> - message PDU

(TEXT Mode)

+CNMI - New Message Indications To Terminal Equipment

+CBM:\<sn\>,\<mid\>,\<dcs\>,\<pag\>,\<pags\>\<CR\>\<LF\>\<data\>

where:

\<sn\> - message serial number

\<mid\> - message ID

\<dcs\> - Data Coding Scheme

\<pag\> - page number

\<pags\> - total number of pages of the message

\<data\> - CBM Content of Message

- If **\<dcs\>** indicates that 3GPP TS 23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS)
- If **\<dcs\>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)

\<ds\> - SMS-STATUS-REPORTs reporting option

0 - status report receiving is not reported to the **DTE** and messages are stored

1 - the status report is sent to the **DTE** with the following unsolicited result code:

(PDU Mode)

+CDS: \<length\>\<CR\>\<LF\>\<PDU\>

where:

\<length\> - PDU length

\<PDU\> - message PDU

(TEXT Mode)

+CDS: \<fo\>,\<mr\>,\<ra\>,\<tora\>,\<scts\>,\<dt\>,\<st\>

where:

\<fo\> - first octet of the message PDU

\<mr\> - message reference number

\<ra\> - recipient address, string type, represented in the currently selected character set (see +CSCS)

\<tora\> - type of number **\<ra\>**

\<scts\> - arrival time of the message to the SC

\<dt\> - sending time of the message

+CNMI - New Message Indications To Terminal Equipment	
	<st> - message status as coded in the PDU
	2 - if a status report is stored, then the following unsolicited result code is sent:
	+CDSI: <memr>,<index>
	where:
	<memr> - memory storage where the new message is stored
	"SR"
	<index> - location on the memory where SMS is stored
	<bfr> - buffered result codes handling method:
	0 - **TA** buffer of unsolicited result codes defined within this command is flushed to the **TE** when **<mode>=1..3** is entered (**OK** response shall be given before flushing the codes)
	1 - **TA** buffer of unsolicited result codes defined within this command is cleared when **<mode>=1..3** is entered.
AT+CNMI?	Read command returns the current parameter settings for **+CNMI** command in the form: **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>**
AT+CNMI=?	Test command reports the supported range of values for the **+CNMI** command parameters.
Reference	3GPP TS 27.005
Example	AT+CMGF=1 OK AT+CNMI=1,2,0,1,0 OK Received message from network +CMT: "+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE

5.5.3.2. List Messages - +CMGL

+CMGL - List Messages	
AT+CMGL [=<stat>]	Execution command reports the list of all the messages with status value **<stat>** stored into **<memr>** message storage (**<memr>** is the

+CMGL - List Messages	

	message storage for read and delete SMs as last settings of command +CPMS).
	
	The parameter type and the command output depend on the last settings of command **+CMGF** (message format to be used)
	
	(PDU Mode)
	Parameter:
	<stat>
	  0 - new message
	  1 - read message
	  2 - stored message not yet sent
	  3 - stored message already sent
	  4 - all messages.
	
	Each message to be listed is represented in the format:
	
	+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>
	
	where:
	<index> - message position in the memory storage list.
	<stat> - status of the message
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
	<length> - length of the PDU in bytes
	<pdu> - message in PDU format according to 3GPP TS 23.040
	
	(Text Mode)
	Parameter:
	<stat>
	  "REC UNREAD" - new message
	  "REC READ" - read message
	  "STO UNSENT" - stored message not yet sent
	  "STO SENT" - stored message already sent
	  "ALL" - all messages.

+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 3GPP TS 23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) Each message delivery confirm is represented in the format**:** **+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>** where **<index>** - message position in the storage **<stat>** - message status **<fo>** - first octet of the message PDU **<mr>** - message reference number **<ra>** - recipient address, string type , represented in the currently selected character set (see **+CSCS**)

+CMGL - List Messages	
	\<tora> - type of number **\<ra>**
	\<scts> - arrival time of the message to the SC
	\<dt> - sending time of the message
	\<st> - message status as coded in the PDU
	Note: If parameter is omitted the command returns the list of SMS with "**REC UNREAD**" status.
AT+CMGL=?	Test command returns a list of supported **\<stat>**s
Example	AT+CMGF=1 Set Text mode
	OK
	AT+CMGL
	+CMGL: 1,"REC UNREAD","+821020955219",,"07/07/26,20:05:11+36"
	SMS Test message
	+CMGL: 2,"REC UNREAD","+821020955219",,"07/07/26,20:05:58+36"
	SMS Test message...
	+CMGL: 3,"REC UNREAD","+821020955219",,"07/07/26,20:06:37+36"
	SMS Test Message..
	+CMGL: 4,"REC UNREAD","+821020955219",,"07/07/26,20:07:43+36"
	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 0A81105678928200 00A70CF4F29C0E6A 97E7F3F0B90C
	+CMGL: 1,2,,21
	07912801929190301164 0A81105165297000 00A709027A794E77B 95C2E
	+CMGL: 26,2,,17

+CMGL - List Messages	
	0881280100990102591164 0A8110567892820014A704C7D1B1DB OK
Reference	3GPP TS 27.005

5.5.3.3. Read Message - +CMGR

+CMGR - Read Message	

AT+CMGR=
<index>
	Execution command reports the message with location value **<index>** from **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS).
	
	Parameter:
	<index> - message index.
	
	The output depends on the last settings of command **+CMGF** (message format to be used)
	
	(PDU Mode)
	The output has the following format:
	
	+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>
	
	where
	<stat> - status of the message
	  0 - new message
	  1 - read message
	  2 - stored message not yet sent
	  3 - stored message already sent
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
	<length> - length of the PDU in bytes.
	<pdu> - message in PDU format according to 3GPP TS 23.040.
	
	The status of the message and entire message data unit **<pdu>** is returned.

+CMGR - Read Message	
	(Text Mode)
	Output format for received messages (the information written in *italics* will be present depending on **+CSDH** last setting)*:*
	+CMGR*: <stat>,<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>, <dcs>,<sca>,<tosca>,<length>]<CR><LF><data>*
	Output format for sent messages:
	+CMGR: <stat>,<da>,<alpha>*[,<toda>,<fo>,<pid>,<dcs>,[<vp>]*, *<sca>,<tosca>,<length>]*<CR><LF><data>
	Output format for message delivery confirm:
	+CMGR: <stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>
	where:
	<stat> - status of the message
	"REC UNREAD" - new received message unread
	"REC READ" - received message read
	"STO UNSENT" - message stored not yet sent
	"STO SENT" - message stored already sent
	<fo> - first octet of the message PDU
	<mr> - message reference number
	<ra> - recipient address, string type, represented in the currently selected character set (see **+CSCS**)
	<tora> - type of number **<ra>**
	<scts> - arrival time of the message to the SC
	<dt> - sending time of the message
	<st> - message status as coded in the PDU
	<pid> - Protocol Identifier
	<dcs> - Data Coding Scheme
	<vp> - depending on SMS-SUBMIT **<fo>** setting:
	Refer to 3GPP TS 23.040 TP-Validity-Period
	a) Not Present if <fo> tells that the Validity Period Format is **Not Present**
	b) Integer type if <fo> tells that the Validity Period Format is **Relative** (default 167)
	c) Quoted time-string type if <fo> tells that the Validity Period Format is **Absolute**

+CMGR - Read Message	
	d) Quoted hexadecimal representation of 7 octets if **<fo>** tells that the Validity Period Format is **Enhanced**.
	<oa> - Originator address, string type represented in the currently selected character set (see +CSCS)
	<da> - Destination address, string type represented in the currently selected character set (see +CSCS)
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
	<sca> - Service Centre number
	<tooa>,<toda >,<tosca> - type of number **<oa>**,**<da>**,*<sca>*
	129 - number in national format
	145 - number in international format (contains the "**+**")
	<length> - text length
	<data> - TP-User_data
	• If **<dcs>** indicates that 3GPP TS 23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
	Note: in both cases if status of the message is 'received unread', status in the storage changes to 'received read'.
AT+CMGR=?	Test command returns the **OK** result code
Example	AT+CMGF=0 OK AT+CMGR=1 +CMGR: 2,,21 0791280192919030116 40A8110516529700000A709027A794E77B95C2E OK AT+CMGF=1 OK AT+CMGR=3 +CMGR: "REC READ","+821020955219",,"07/07/19,10:06:34+36" test message/.....

+CMGR - Read Message	
	OK
Reference	3GPP TS 27.005

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

+CNMA – New Message Acknowledgement	

(PDU Mode)
 	
AT+CNMA[=<n> [,<length>[<CR> PUD is given<ctrl-Z/ESC]]]
	Execution command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE.
	
	Acknowledge with +CNMA is possible only if the +CSMS parameter is set to 1(+CSMS=1) when a +CMT or +CDS indication is show.
	
	If no acknowledgement is given within the network timeout, an RP-ERROR is sent to the network, the <mt> and <ds> parameters of the +CNMI command are then reset to zero (do not show new message indication).
	
	Either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the 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>

+CNMA – New Message Acknowledgement	
Example	**(PDU Mode)**
	SMS AT commands compatible with 3GPP TS 27.005 Phase 2+ version.
	AT+CSMS=1
	+CSMS: 1,1,1
	OK
	Set PDU mode.
	AT+CMGF=0
	OK
	AT+CNMI=2,2,0,0,0
	OK
	Message is received from network.
	+CMT: "",70
	06816000585426000480980600F170110370537284…
	Send positive acknowledgement to the network.
	AT+CNMA=0
	OK
	Message is received from network.
	+CMT: "",70
	06816000585426000480980600F170110370537284…
	Send negative acknowledgement (Unspecified error) to the network.
	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

+CNMA – New Message Acknowledgement	
	OK
	Set Text mode.
	AT+CMGF=1
	OK
	AT+CNMI=2,2,0,0,0
	OK
	Message is received from network.
	+CMT: "+821020955219",,"07/07/26,20:09:07+36"
	TEST MESSAGE
	Send positive acknowledgement to the network.
	AT+CNMA
	OK
Reference	3GPP TS 27.005

5.5.4. Message Sending And Writing

5.5.4.1. Send Message - +CMGS

+CMGS - Send Message	
(PDU Mode)	**(PDU Mode)**
AT+CMGS= \<length>	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.

+CMGS - Send Message	
	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:
	+CMGS: <mr>[, <scts>]
	where
	<mr> - message reference number.
	<scts> - TP-Service Centre Time Stamp in Time String Format.
	Note: if message sending fails for some reason, an error code is reported.
	Note: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.
(Text Mode) **AT+CMGS=<da> [,<toda>]**	**(Text Mode)** Execution command sends to the network a message. Parameters:

+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 3GPP TS 23.038 default alphabet is used and current **\<fo\>** (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM/WCDMA alphabet, according to 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used.
	- if current **\<dcs\>** (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current **\<fo\>** (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**)
	Note: the **DCD** signal shall be in **ON** state while text is entered.
	Note: the echoing of entered characters back from the TA is controlled by echo command **E**
	To send the message issue **Ctrl-Z** char (**0x1A** hex).
	To exit without sending the message issue **ESC** char (**0x1B** hex).
	If message is successfully sent to the network, then the result is sent in the format:
	Note : Optionally (when +CSMS \<service\> value is 1 and network supports) \<scts\> is returned:

+CMGS - Send Message	
	+CMGS: <mr>[, <scts>] where **<mr>** - message reference number. <scts> - TP-Service Centre Time Stamp in Time String Format. Note: if message sending fails for some reason, an error code is reported. Note: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued. Note: it is possible to send a concatenation of at most 10 SMs; the maximum number of chars depends on the **<dcs>**: 1520 chars if 3GPP TS 23.038 default alphabet is used, 1330 chars if 8-bit is used, 660 chars if UCS2 is used
AT+CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	Set PDU mode AT+CMGF=0 OK AT+CMGS=18 > 0881280100990102591155 0B811020905512F90000A704F4F29C0 E +CMGS: 124 OK Set text mode AT+CMGF=1 OK AT+CSMP=17,167,0,0 OK AT+CMGS="01090255219",129 >TEST MESSAGE +CMGS:125 OK
Reference	3GPP TS 27.005

+CMSS - Send Message From Storage	
AT+CMSS= **<index>[,<da>** **[,<toda>]]**	Execution command sends to the network a message that is already stored in the **<memw>** storage (see **+CPMS**) at the location **<index>**.
	Parameters:
	<index> - location value in the message storage **<memw>** of the message to send
	<da> - destination address, string type represented in the currently selected character set (see **+CSCS**); if it is given it shall be used instead of the one stored with the message.
	<toda> - type of destination address
	129 - number in national format
	145 - number in international format (contains the "**+**")
	If message is successfully sent to the network then the result is sent in the format:
	(Note : Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned)
	+CMSS: <mr>[, <scts>]
	where:
	<mr> - message reference number.
	<scts> - TP-Service Centre Time Stamp in Time String Format.
	If message sending fails for some reason, an error code is reported:
	+CMS ERROR:<err>
	Note: to store a message in the **<memw>** storage see command **+CMGW.**
	Note: care must be taken to ensure that during the command execution, which may take several seconds, no other **SIM** interacting commands are issued.
AT+CMSS=?	Test command returns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	AT+CMGF=1 OK AT+CMGW="0165872928"

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

5.5.4.3. Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	

(PDU Mode)
 	
AT+CMGW=
<length>
[,<stat>]
	(PDU Mode)
	
	Execution command writes in the **<memw>** memory storage a new message.
	
	Parameter:
	<length> - length in bytes of the PDU to be written.
	  7..164
	<stat> - message status.
	  0 - new message
	  1 - read message
	  2 - stored message not yet sent (default)
	  3 - stored message already sent
	
	The device responds to the command with the prompt '>' and waits for the specified number of bytes.
	
	To write the message issue **Ctrl-Z** char (**0x1A** hex).
	To exit without writing the message issue **ESC** char (**0x1B** hex).
	
	If message is successfully written in the memory, then the result is sent in the format:
	
	+CMGW: <index>
	
	where:
	<index> - message location index in the memory **<memw>**.

+CMGW - Write Message To Memory	
	If message storing fails for some reason, an error code is reported.
	Note: care must be taken to ensure that during the command execution, no other SIM interacting commands are issued.
(Text Mode) **AT+CMGW[=<da> [,<toda> [,<stat>]]]**	**(Text Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +CSCS). **<toda>** - type of destination address. 129 - number in national format 145 - number in international format (contains the "**+**") **<stat>** - message status. "REC UNREAD" - new received message unread "REC READ" - received message read "STO UNSENT" - message stored not yet sent (default) "STO SENT" - message stored already sent After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** After this prompt text can be entered; the entered text should be formatted as follows: - if current **<dcs>** (see +CSMP) indicates that 3GPP TS 23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM/WCDMA alphabet, according to 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used. - if current **<dcs>** (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'**

+CMGW - Write Message To Memory	
	will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**)
	Note: the **DCD** signal shall be in ON state while text is entered.
	Note: the echoing of entered characters back from the TA is controlled by echo command **E**
	To write the message issue **Ctrl-Z** char (**0x1A** hex).
	To exit without writing the message issue **ESC** char (**0x1B** hex).
	If message is successfully written in the memory, then the result is sent in the format:
	+CMGW: <index>
	where:
	<index> - message location index in the memory **<memw>**.
	If message storing fails for some reason, an error code is reported.
	Note: care must be taken to ensure that during the command execution, no other SIM interacting commands are issued.
	Note: it is possible to save a concatenation of at most 10 SMs; the maximum number of chars depends on the **<dcs>**: 1520 chars if 3GPP TS 23.038 default alphabet is used, 1330 chars if 8-bit is used, 660 chars if UCS2 is used
AT+CMGW=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.005
Example	AT+CMGF=0 Set PDU mode OK AT+CMGW=18 > 0881280100990102591155 0B811020905512F90000A704F4F29C0E +CMGW: 29 OK AT+CMGF=1 Set text mode

+CMGW - Write Message To Memory	
	OK AT+CSMP=17,167,0,0 OK
	AT+CSCA="821029190903",145
	OK
	AT+CMGW="0165872928"
	> test message... +CMGW: 28
	OK
Note	To avoid malfunctions is suggested to wait for the **+CMGW: \<index>** or **+CMS ERROR: \<err>** response before issuing further commands.

5.5.4.4. Delete Message - +CMGD

+CMGD - Delete Message	
AT+CMGD= **\<index>** **[,\<delflag>]**	Execution command deletes from memory **\<memr>** the message(s).
	Parameter:
	\<index> - message index in the selected storage **\<memr>**
	\<delflag> - an integer indicating multiple message deletion request.
	0 (or omitted) - delete message specified in **\<index>**
	1 - delete all read messages from **\<memr>** storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched
	2 - delete all read messages from **\<memr>** storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched
	3 - delete all read messages from **\<memr>** storage, sent and unsent mobile originated messages, leaving unread messages untouched
	4 - delete all messages from **\<memr>** storage.
	Note: if **\<delflag>** is present and not set to 0 then **\<index>** is ignored and ME shall follow the rules for **\<delflag>** shown above.
	Note: in case of Verizon, delete a empty slot with specified \<index> will return +CMS ERROR: 321

+CMGD - Delete Message	
AT+CMGD=?	Test command shows the valid memory locations and optionally the supported values of **<delflag>**. **+CMGD: (supported <index>s list)[,(supported <delflag>s list)]**
Example	AT+CMGD=? +CMGD: (1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25, 26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,4 7,48,49,50),(0-4) OK AT+CMGD=10　　　　　Delete message in 10th record OK AT+CMGD=1,4　　　　　Delete all messages OK
Reference	3GPP TS 27.005

5.5.5.　　　　　3GPP2 AT Commands for SMS

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

5.5.5.1. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	
AT+CPMS= <memr>[,<memw > **]**	Set command selects memory storages **<memr>**, **<memw>** to be used for reading, writing, sending and storing SMs. Parameters: **<memr>** - memory from which messages are read and deleted 　"ME" – SMS memory storage into module (default if SIM storage is not supported) 　"SM" – SIM SMS memory storage (default) **<memw>** - memory to which writing and sending operations are made 　"ME" – SMS memory storage into module (default if SIM storage is not supported) 　"SM" – SIM SMS memory storage (default) The command returns the memory storage status in the format:

+CPMS - Preferred Message Storage	
	+CPMS: <usedr>,<totalr>,<usedw>,<totalw> where: <usedr> - number of SMs stored into <memr> <totalr> - max number of SMs that <memr> can contain <usedw> - number of SMs stored into <memw> <totalw> max number of SMs that <memw> can contain
AT+CPMS?	Read command reports the message storage status in the format: +CPMS: <memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw> where <memr>, <memw> are the selected storage memories for reading, writing and storing respectively.
AT+CPMS=?	Test command reports the supported values for parameters <memr>, <memw>
Example	AT+CPMS=? +CPMS: (“ME”,“SM”),(“ME”,“SM”) OK AT+CPMS? +CPMS: “ME”,5,99, “ME”,5,99 OK AT+CPMS=“ME”, “ME” +CPMS: 5,99,5,99 OK AT+CPMS? +CPMS: “ME”,5,99, “ME”,5,99 OK AT+CPMS=“SM”, “SM” +CPMS: 2,20,2,20

+CPMS - Preferred Message Storage	
	OK
	AT+CPMS?
	+CPMS: "SM",2,20,"SM",2,20
	OK

5.5.5.2. Set Text Mode Parameters - +CSMP

+CSMP - Set Text Mode Parameters	
AT+CSMP= [<callback_addr> [,<tele_id > [,<priority> [,<enc_type >]]]]	Set command is used to select values for additional parameters for storing and sending SMs when the text mode is used (**AT+CMGF=1**)
	Parameters:
	<callback_addr> - Callback address.
	Note: The maximum length is different with every carrier.
	In case of Verizon: Maximum length is 20 characters.
	In other cases: Maximum length is 32 characters
	Note: Initially, this parameter is null. Some carrier networks discard SMS's without a callback number. Therefore, we recommend that customer setup callback number using AT+CSMP command.
	<tele_id> - Teleservice ID
	4097 - page
	4098 - SMS message (factory default)
	4101 - EMS message(concatenated)
	<priority> - Priority
	Note: The priority is different with every carrier.
	0 - Normal (factory default)
	1 - Interactive
	2 - Urgent
	3 - Emergency
	In case of Verizon:
	0 - Normal (factory default)
	1 – High

+CSMP - Set Text Mode Parameters	

	<enc_type> - data coding scheme:
	
	   0 - 8-bit Octet
	
	   2 - 7-bit ASCII (factory default)
	
	   4 - 16-bit Unicode
	
	   9 - GSM 7bit
	
	Note: the current settings are stored through **+CSAS**

AT+CSMP?	Read command reports the current setting in the format: **+CSMP: < callback_addr >,<tele_id >,< priority >,< enc_type >**
AT+CSMP=?	Test command returns the **OK** result code.
Example	AT+CSMP=? OK AT+CSMP? +CSMP: "",4098,0,2 OK AT+CSMP="1234567890",4097,1,2 OK AT+CSMP? +CSMP: "1234567890",4097,1,2 OK

5.5.5.3. Save Settings - +CSAS

+CSAS - Save Settings	
AT+CSAS **[=<profile>]**	Execution command saves settings made by, +**CSMP** command in local non-volatile memory Parameter: **<profile>** 0,1 - it saves the settings to NVM. Note: If parameter is omitted the settings are saved to profile 0 in the non-volatile memory.

+CSAS - Save Settings	
AT+CSAS=?	Test command returns the possible range of values for the parameter **\<profile\>**.
Example	AT+CSAS=? +CSAS: (0,1) OK AT+CSAS OK AT+CSAS=1 OK AT+CSAS=0 OK

5.5.5.4. Restore Settings - +CRES

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

+CNMI - New Message Indications To Terminal Equipment	

AT+CNMI=[<mt>]	Set command selects the behaviour of the device on how the receiving of new messages from the network is indicated to the **DTE**.
	
	Parameter:
	
	<mt> - The information written in italics will be present depending on **+CSDH** last setting.
	
	Unsolicited result codes buffering option
	
	 0 - No Indication (factory default)
	
	 1 - Indicate like below
	
	   +CMTI: <memr>,<index>
	
	    <memr> - memory storage where the new message is stored
	
	      "ME"
	
	    <index> - location on the memory where SMS is stored.
	
	 2 - Indicate like below
	
	<div align=center>(**PDU Mode**)</div>
	  +CMT: ,<length><CR><LF><pdu>
	
	   <length> - PDU length
	
	   <pdu> - PDU Message
	
	<pdu>:
	<orig_num><date><tele_id><priority><enc_type><udh><length><data>
	
	where:
	
	<orig_num> : <addr_len><tooa><address>
	
	     <addr_len> : Octets length of address field(1 Octet : <tooa> and <address>).
	
	     <tooa> : Type of address(1 Octet).
	
	     <addres> : Address digits with representation of semi-octets.
	
	<date> : Serivce center time stamp (6 Octets : YYMMDDHHMMSS).
	
	<tele_id> : Teleservice ID (2 Octets).
	
	<priority> : Priority(1 Octet).
	
	<enc_type> : Encoding type(1 Octet).
	
	<udh> : User data header (1 Octet).

+CNMI - New Message Indications To Terminal Equipment

	<length> : Refer to below **Note** (1 Octet).
	
	   <data> : User data of message.
	
	Note:
	
	In **<pdu>:**
	<orig_num><date><tele_id><priority><enc_type><udh><length><data>,
	
	If user data header**<udh>** is present,
	
	   If encoding type is 7bit ASCII,
	
	    <length> value is the sum of the number of septets in user data and the number of septets in user data header (including any padding).
	
	   Otherwise,
	
	    <length> value is the sum of the number of octets in user data and the number of octets in user data header.
	
	If user data header**<udh>** is not present,
	
	   If encoding type is 7bit ASCII,
	
	    <length> value is the number of septets in user data.
	
	   Otherwise,
	
	    <length> value is the number of octets in user data.
	
	                   (**TEXT Mode**)
	
	+CMT:
	<orig_num>,<callback>,<date>[,<tooa>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]<CR><LF><data>
	
	  <orig_num> - Origination number.
	
	  <callback> - Callback number.
	
	  <date> - Received date in form as "YYYYMMDDHHMMSS".
	
	  <tooa> - Type of **<orig_num>**.
	
	  <tele_id> - Teleservice ID.
	
	     4097 - page
	
	     4098 - SMS message
	
	     4099 - voice mail notification
	
	     4101 - EMS message(concatenated)
	
	     262144 - voice mail notification
	
	  <priority> - Priority.
	
	     Note: The priority is different with every carrier.
	
	     0 - Normal (factory default)
	
	     1 - Interactive

+CNMI - New Message Indications To Terminal Equipment	
	2 - Urgent
	3 - Emergency
	In case of Verizon:
	0 - Normal (factory default)
	1 – High
	<enc_type> - Encoding type of message.
	0 - 8-bit Octet
	2 - 7-bit ASCII
	4 - 16-bit Unicode
	9 – GSM 7bit
	<udh> - User data header
	0 - Not present the user data header
	1 - Present the user data header
	<length> - Length of message.
	<data> - Message data. (Indicates the new voice mail count, if <tele_id> is voice mail notification)
	Note : Regardless of <mt>, a message is saved in SMS memory storage.
AT+CNMI?	Read command returns the current parameter settings for **+CNMI** command in the form: **+CNMI: <mt>**
AT+CNMI=?	Test command reports the supported range of values for the **+CNMI** command parameters.
Example	AT+CNMI=? +CNMI: (0-2) OK AT+CNMI=1 OK AT+CNMI? +CNMI: 1 OK +CMTI:"ME",98 AT+CNMI=2

+CNMI - New Message Indications To Terminal Equipment	
	OK
	AT+CNMI?
	+CNMI: 2
	OK
	+CMT: "My Number","My Number",20141023165007,129,4098,0,2,0,8
	TEST SMS

5.5.5.6. List Messages - +CMGL

+CMGL - List Messages	

AT+CMGL
[=<stat>]
	Execution command reports the list of all the messages with status value **<stat>** stored into **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS).
	
	The parameter type and the command output depend on the last settings of command **+CMGF** (message format to be used)
	
	(PDU Mode)
	Parameter:
	<stat>
	  0 - new message
	  1 - read message
	  2 - stored message not yet sent
	  3 - stored message already sent
	  4 - all messages.
	
	Each message to be listed is represented in the format:
	+CMGL: <index>,<stat>,"",<length><CR><LF><pdu>
	
	Case of received message from base station :
	  <PDU>:
	  <orig_num><date><tele_id><priority><enc_type><udh><length><data>
	Case of sending message to base station:
	  <PDU>:
	  <da><callback><tele_id><priority><enc_type><udh><length><data>

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

+CMGL - List Messages

where:

<index> - message position in the memory storage list.

<stat> - status of the message

<length> - length of the PDU in bytes

<pdu> - message in PDU format

(Text Mode)

Parameter:

<stat>

"REC UNREAD" - new message

"REC READ" - read message

"STO UNSENT" - stored message not yet sent

"STO SENT" - stored message already sent

"ALL" - all messages.

Each message to be listed is represented in the format (the information written in italics will be present depending on +CSDH last setting):

If there is at least a **Received** message to be listed the representation format is:

+CMGL:
<index>,<stat>,<orig_num>,<callback>,<date>*[,<tooa>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]*<CR><LF> <data>

If there is at least a **Sent** or an **Unsent** message to be listed the representation format is:

+CMGL:
<index>,<stat>,<da>,<callback>,*[,<toda>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]*<CR><LF><data>

Where

     <orig_num> - Origination number.

     <callback> - Callback number.

     <date> - Received date in form as "YYYYMMDDHHMMSS".

     <tooa> - Type of <orig_num>.

     <toda> - Type of <**da**>.

+CMGL - List Messages	
	<tele_id> - Teleservice ID.
	4097 - page
	4098 - SMS message
	4099 - voice mail notification
	4101 - EMS message(concatenated)
	262144 - voice mail notification
	<priority> - Priority.
	0 - Normal (factory default)
	1 - Interactive
	2 - Urgent
	3 - Emergency
	<enc_type> - Encoding type of message.
	0 - 8-bit Octet
	2 - 7-bit ASCII
	4 - 16-bit Unicode
	9 - GSM 7bit
	<udh> - User data header
	0 - Not present the user data header
	1 - Present the user data header
	<length> - Length of message.
	<data> - Message data. (Indicates the new voice mail count, if <tele_id> is voice mail notification)
	Note: If a message is present when +CMGL="ALL" is used it will be changed status from **REC UNREAD** to **REC READ**.
AT+CMGL=?	Test command returns a list of supported **<stat>**s
Example	**(PDU Mode)**
	Case of received message from base station:
	AT+CMGL=1
	+CMGL: 13,1,"",51
	068110413943061410231558201002020200024C3870E1C3870E1C 3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10
	OK
	06 <addr_len: 6byte>

	81 <type_addr: 129>
	1041394306 <Origination number: 0114933460>
	141023155820 <Date: 14/10/23,15:58:20>
	1002 <Teleservice_id: 4098(decimal)>
	02 <priority: urgent >
	02 <encoding_type: 7-bit ASCII >
	00 <udh: Not present user data header >
	24 <data_len: 36>
	C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C 3870E1C3870E10
	<user_data: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa>
	Else:
	AT+CMGL=2
	+CMGL: 31,2,"",23
	07801091346554F307801091346554F310020000000A6161616161 6161616161
	OK
	07 <addr_len: 7byte>
	81 <type_addr:129>
	1091346554F3 <Destination_addr: 01194356453>
	07 <addr_len: 7byte>
	81 <type_addr:129>
	1096224658F1 <Callback_Number: 01692264851>
	1002 <Teleservice_id: 4098(decimal)>
	00 <priority: normal >
	00 <encoding_type: 8-bit Octet >
	00 <udh: Not present user data header >
	0A <data_len: 10>
	61616161616161616161 <data: aaaaaaaaaa>
	AT+CMGF=0
	OK
	AT+CMGF?
	+CMGF: 0

+CMGL - List Messages	
	OK
	AT+CMGL=?
	(0-4)
	OK
	AT+CMGL=4
	+CMGL: 0,2,"",19
	068110413943060681104139430610020000000006313233343536
	+CMGL: 1,2,"",22
	0681104139430606811041394306100200000009313233343536363737
	+CMGL: 2,2,"",25
	068110413943060681104139430610020000000C313132323334343434343434
	+CMGL: 3,2,"",28
	068110413943060681104139430610020000000F6166666173646565656565656565656565
	OK
	(Text Mode)
	AT+CMGF=1
	OK
	AT+CMGF?
	+CMGF: 1
	OK
	AT+CMGL=?
	("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL")
	OK
	AT+CMGL="ALL"
	+CMGL: 0,"STO UNSENT","My Number","My Number",
	123456
	+CMGL: 1, "STO UNSENT","My Number","My Number",
	123456677
	+CMGL: 2, "STO UNSENT","My Number","My Number",

+CMGL - List Messages	
	112234444444
	+CMGL: 3, "STO UNSENT","My Number","My Number",
	affasdeeeeeeeee
	OK

5.5.5.7. Read Message - +CMGR

+CMGR - Read Message	
AT+CMGR= **<index>**	Execution command reports the message with location value **<index>** from **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS).
	Parameter:
	<index> - message index.
	The output depends on the last settings of command **+CMGF** (message format to be used)
	(PDU Mode)
	If there is at least one message to be listed the representation format is:
	+CMGR:<stat>,"",<length><CR><LF><PDU>
	Case of received message from base station :
	<PDU>:
	<orig_num><date><tele_id><priority><enc_type><udh><length><data>
	Case of sending message to base station:
	<PDU>:
	<da><callback><tele_id><priority><enc_type><udh><length><data>
	where:
	<orig_num> : <addr_len><tooa><address>
	<addr_len> : Octets length of address field(1 Octet : <tooa> and <address>).

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

+CMGR - Read Message	
	0 - new message
	1 - read message
	2 - stored message not yet sent
	3 - stored message already sent
	<length> - length of the PDU in bytes.
	<pdu> - message in PDU format
	(Text Mode)
	Output format for received messages (the information written in *italics* will be present depending on **+CSDH** last setting)*:*
	Output format for message delivery confirm:
	+CMGR: <stat>,<orig_num>,<callback>,<date>*[,<tooa>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]*<CR><LF><data>
	If there is either a **Sent** or an **Unsent** message in location <index> the output format is:
	+CMGR: <stat>,<da>,<callback>,*[,<toda>,<tele_id>,<priority>,<enc_type>,<udh>,<length>]*<CR><LF><data>
	where:
	<stat> - status of the message
	"REC UNREAD" - new received message unread
	"REC READ" - received message read
	"STO UNSENT" - message stored not yet sent
	"STO SENT" - message stored already sent
	<orig_num> - Origination number.
	<callback> - Callback number.
	<date> - Received date in form as "YYYYMMDDHHMMSS".
	<tooa> - Type of <**orig_num**>.
	<toda> - Type of <**da**>.
	<tele_id> - Teleservice ID.
	4097 - page
	4098 - SMS message
	4099 - voice mail notification
	4101 - EMS message(concatenated)

+CMGR - Read Message	
	262144 - voice mail notification
	<priority> - Priority.
	Note: The priority is different with every carrier.
	0 - Normal (factory default)
	1 - Interactive
	2 - Urgent
	3 - Emergency
	In case of Verizon:
	0 - Normal (factory default)
	1 – High
	<enc_type> - Encoding type of message.
	0 - 8-bit Octet
	2 - 7-bit ASCII
	4 - 16-bit Unicode
	9 - GSM 7bit
	<udh> - User data header
	0 - Not present the user data header
	1 - Present the user data header
	<length> - Length of message.
	<data> - Message data. (Indicates the new voice mail count, if <tele_id> is voice mail notification)
AT+CMGR=?	Test command returns the **OK** result code
Example	**(PDU Mode)**
	Case of received message from base station:
	AT+CMGR=29
	+CMGR: 1,"",51
	06811041394306141023155820100202020024C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10
	OK
	06 <addr_len: 6byte>
	81 <type_addr: 129>
	1041394306 <Origination number: 0114933460>
	141023155820 <Date: 14/10/23,15:58:20>
	1002 <Teleservice_id: 4098(decimal)>

	02	<priority: urgent >
	02	<encoding_type: 7-bit ASCII >
	00	<udh: Not present user data header >
	24	<data_len: 36 >

C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C
3870E1C3870E10

  <user_data: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa>

Else:

AT+CMGR=31

+CMGR: 2,"",23

07801091346554F307801091346554F310020000000A6161616161
6161616161

OK

07	<addr_len: 7byte>
81	<type_addr:129>
1091346554F3	<Destination_addr: 01194356453>
07	<addr_len: 7byte>
81	<type_addr:129>
1096224658F1	<Callback_Number: 01692264851>
1002	<Teleservice_id: 4098(decimal)>
00	<priority: normal >
00	<encoding_type: 8-bit Octet >
00	<udh: Not present user data header >
0A	<data_len: 10>
6161616161616161616161	<data: aaaaaaaaaa>

(Text Mode)

AT+CSDH=1

OK

AT+CMGR=1

+CMGR: "REC READ", "0114933460", "01149334690",
20140109180259, 129, 4098,0,2,0,12

TEST MESSAGE

OK

+CMGR - Read Message

	AT+CMGR=4
	+CMGR: "STO UNSENT","0114933460","0114933460",,129,4098,0,0,0,12
	TEST MESSAGE
	OK

5.5.5.8. Send Message - +CMGS

+CMGS - Send Message	
(PDU Mode) **AT+CMGS= <length>**	**(PDU Mode)** Execution command sends to the network a message. After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** and waits for the specified number of bytes. Parameter: **<length>** - length of the PDU to be sent in bytes (excluding the Destination Address octets). 5..183 Note: the echoing of given characters back from the TA is controlled by echo command **E** Note: the **PDU** shall be hexadecimal format (each octet of the **PDU** is given as two IRA character long hexadecimal number) and given in one line. To send the message issue **Ctrl-Z** char (**0x1A** hex). To exit without sending the message issue **ESC** char (**0x1B** hex). If message is successfully sent to the network, then the result is sent in the format: **+CMGS: <mr>**

+CMGS - Send Message	
	where
	<mr> - message reference number.
	Note: If message sending fails for some reason, an error code is reported.
Example	**(PDU Mode)**
	AT+CMGF=0
	OK
	AT+CMGS=36
	>07811091346554F307811096224658F11002000001662626262626
	262626262626262626262626262626262
	+CMGS: 4
	OK
	07 <addr_len: 7byte>
	81 <type_addr: 129>
	1091346554F3 <Destination_address:01194356453>
	07 <addr_len: 7byte>
	81 <type_addr: 129>
	1096224658F1 <callback_address:01692264851>
	1002 <Teleservice_id: 4098(decimal)>
	00 <priority: normal >
	00 <encoding_type: octet >
	00 <udh: Not present user data header >
	16 <data_len: 22>
	62626262626262626262626262626262626262626262
	<user_data: bbbbbbbbbbbbbbbbbbbbbb>
	AT+CMGS=32
	>07811091346554F307811091346554F3100202020014C3870E1C
	3870E1C387162C58B162C58B1620
	+CMGS: 3
	OK
	07 <addr_len: 7byte>
	81 <type_addr: 129>
	1091346554F3 <destination_address:01194356453>
	07 <addr_len: 7byte>
	81 <type_addr: 129>
	1091346554F3 <callback_address: 01194356453>
	1002 <Teleservice_id: 4098(decimal)>
	02 <priority: ungent >
	02 <encoding_type: 7-bit ASCII >
	00 <udh: Not present user data header >
	14 <data_len: 20>
	C3870E1C3870E1C387162C58B162C58B1620
	<user_data: aaaaaaaaaabbbbbbbbbb>

+CMGS - Send Message	
	Note:
	If user data header**<udh>** is present,
	If encoding type is 7bit ASCII,
	<data_len> value is the sum of the number of septets in user data and the number of septets in user data header (including any padding).
	Otherwise,
	<data_len> value is the sum of the number of octets in user data and the number of octets in user data header.
	If user data header**<udh>** is not present,
	If encoding type is 7bit ASCII,
	<data_len> value is the number of septets in user data.
	Otherwise,
	<data_len> value is the number of octets in user data.
(Text Mode) **AT+CMGS=<da>** **[,<toda>]**	**(Text Mode)**
	Execution command sends to the network a message.
	Parameters:
	<da> - destination address, string type represented in the currently selected character set (see +CSCS);
	ASCII characters in the set (0 9), #,*;
	Note: The maximum length is different with every carrier.
	In case of Verizon: Maximum length is 20 characters.
	In other cases: Maximum length is 32 characters
	<toda> - type of destination address
	129 - number in national format
	145 - number in international format (contains the "**+**")
	To send the message issue **Ctrl-Z** char (**0x1A** hex).
	To exit without sending the message issue **ESC** char (**0x1B** hex).
	If message is successfully sent to the network, then the result is sent in the format:
	+CMGS: <mr>

+CMGS - Send Message	
	where
	<mr> - message reference number.
	Note: if message sending fails for some reason, an error code is reported.
	Note: To discard SMS, press the "ESC" key, an "OK" response will be returned.
	Note: it is possible to send a concatenation of at most 10 SMs in Verizon Network. For sending a concatenation message, the teleservice ID should be set to 4101 and the data coding scheme should be set to 9.
AT+CMGS=?	Test command returns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	**(Text Mode)**
	AT+CMGF=1 OK AT+CMGS="9194547830" > Test SMS +CMGS: 1 OK

5.5.5.9. Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	
(PDU Mode)	**(PDU Mode)**
AT+CMGW= **<length>** **[,<stat>]**	Execution command writes in the **<memw>** memory storage a new message.
	Parameter:
	<length> - length in bytes of the PDU to be written. (excluding the Destination Address octets)
	5..183
	<stat> - message status.
	0 - new message
	1 - read message
	2 - stored message not yet sent (default)
	3 - stored message already sent

+CMGW - Write Message To Memory	
	The device responds to the command with the prompt '>' and waits for the specified number of bytes. To write the message issue **Ctrl-Z** char (**0x1A** hex). To exit without writing the message issue **ESC** char (**0x1B** hex). If message is successfully written in the memory, then the result is sent in the format: **+CMGW: <index>** where: **<index>** - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported.
Example	**<PDU Mode>** AT+CMGF=0 OK AT+CMGW=36 >07811091346554F307811096224658F1100200000016626262626 262626262626262626262626262626262626262 +CMGW: 4 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <Destination_address: 01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129> 1096224658F1 <callback_address: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: octet > 00 <udh: Not present user data header > 16 <data_len: 22>

+CMGW - Write Message To Memory	

	6262626262626262626262626262626262626262
	
	<center><user_data: bbbbbbbbbbbbbbbbbbbb></center>
	
	Note:
	
	If user data header**<udh>** is present,
	
	   If encoding type is 7bit ASCII,
	
	     <data_len> value is the sum of the number of septets in user data and the number of septets in user data header (including any padding).
	
	    Otherwise,
	
	     <data_len> value is the sum of the number of octets in user data and the number of octets in user data header.
	
	If user data header**<udh>** is not present,
	
	   If encoding type is 7bit ASCII,
	
	    <data_len> value is the number of septets in user data.
	
	    Otherwise,
	
	     <data_len> value is the number of octets in user data.

(Text Mode)
 	
AT+CMGW[=<da>
[,<toda>
[,<stat>]]]
	<center>**(Text Mode)**</center>
	
	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);
	
	   ASCII characters in the set (0 9), #,*;
	
	   Note: The maximum length is different with every carrier.
	
	    In case of Verizon: Maximum length is 20 characters.
	
	    In other cases: Maximum length is 32 characters
	
	<toda> - type of destination address
	
	  129 - number in national format
	
	  145 - number in international format (contains the "**+**")
	
	<stat> - message status.
	
	 "REC UNREAD" - new received message unread
	
	 "REC READ" - received message read
	
	 "STO UNSENT" - message stored not yet sent (default)
	
	 "STO SENT" - message stored already sent

+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)** Note: the echoing of entered characters back from the TA is controlled by echo command **E** To write the message issue **Ctrl-Z** char (**0x1A** hex). To exit without writing the message issue **ESC** char (**0x1B** hex). If message is successfully written in the memory, then the result is sent in the format: **+CMGW: <index>** where: **<index>** - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported. Note: To discard SMS, press the "ESC" key, an "OK" response will be returned. Note: it is possible to save a concatenation of at most 10 SMs if the operator is Verizon. For saving a concatenation message, the teleservice ID should be set to 4101 and the data coding scheme should be set to 9.
AT+CMGW=?	Test command returns the **OK** result code.
Example	**(Text Mode)** AT+CMGW=? OK AT+CMGF=1 OK AT+CMGW > Test message

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

5.6. Telit Custom AT Commands

5.6.1. General Configuration AT Commands

5.6.1.1. USB Configuration - #USBCFG

#USBCFG- USB Configuration	
AT#USBCFG=<mode>	Set command sets the USB compostion according to <mode> number given, where: 0 – use 0x1042 composition file 1 – use 0x1040 composition file (Factory Default) 2 – use 0x1041 composition file 3 – use 0x1043 composition file 5 – use 0x1045 composition file 0x1042: Rndis + DIAG + ADB + NMEA + MODEM + MODEM + AUX 0x1040: DIAG + ADB + RMnet + NMEA + MODEM + MODEM + AUX

#USBCFG- USB Configuration	
	0x1041: DIAG + ADB + MBIM +| NMEA + MODEM + MODEM + AUX
	0x1043: DIAG + ADB + ECM + NMEA + MODEM + MODEM + AUX
	0x1045: Rndis + DIAG + ADB+NMEA + MODEM + MODEM + AUX + Audio
	Note: The modem device reset, automatically and new USB composition applied from the next boot up time, if this command is done, successfully.
	Note: The value stored in file system region whenever Set command executed.
	Note: Regarding PID_0x1045, USB will enumerate when sound device is ready state.
	Note: PID_1045 is supported for backward compatibility, but LM940 does not support audio feature due to data only mode.
AT#USBCFG?	Read command returns the current composition set by number as detailed in the section above: 0x1042 composition file return 0 0x1040 composition file return 1 0x1041 composition file return 2 0x1043 composition file return 3 0x1045 composition file return 5
AT#USBCFG=?	Test command returns the list of supported values.

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

+IMEISV – Request International Mobile station Equipment Identity and Software Version	
AT+IMEISV	Execution command returns the International Mobile station Equipment Identity and Software Version Number, identified as the IMEISV of the mobile, without command echo. The IMEISV is composed of the following elements (each element shall consist of decimal digits only):

+IMEISV – Request International Mobile station Equipment Identity and Software Version	
	- Type Allocation Code (TAC). Its length is 8 digits;
	- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits;
	- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.
AT+IMEISV=?	Test command returns **OK** result code.
Reference	3GPP TS 23.003

5.6.1.3. 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 SIM status change through the following unsolicited indication:
	
	   #QSS: <status>,<active_slot>
	
	   where:
	   <status> - current SIM status
	
	     0 - SIM NOT INSERTED
	     1 - SIM INSERTED
	
	   <active_slot> - current active SIM slot
	
	     0 - SIM slot1
	     1 - SIM slot2
	
	 2 - enabled; the ME informs SIM status change through the following unsolicited indication:
	
	   #QSS: <status>,<active_slot>
	
	   where:
	   <status> - current SIM status
	
	     0 - SIM NOT INSERTED

#QSS - Query SIM Status	
	1 - SIM INSERTED 2 - SIM INSERTED and PIN UNLOCKED 3 - SIM INSERTED and READY (SMS and Phonebook access are possible). **<active_slot>** - current active SIM slot 0 - SIM slot1 1 - SIM slot2 Note: the command reports the SIM status change after the <mode> has been set to 2. We suggest to set <mode>=2 and save the value in the user profile, then power off the module. The proper SIM status will be available at the next power on.
AT#QSS?	Read command reports whether the unsolicited indication **#QSS** is currently enabled or not, along with the SIM status, in the format: **#QSS: <mode>,<status>,<active_slot>** (**<mode>**, **<status>** and **<active_slot>** are described above)
AT#QSS=?	Test command returns the supported range of values for parameter **<mode>**.
Example	AT#QSS? #QSS:0,1,0 OK

5.6.1.4. SIM Detection Mode - #SIMDET

#SIMDET - SIM Detection Mode	
AT#SIMDET= **<mode>**	Set command specifies the SIM Detection Mode. Parameter: **<mode>** - SIM Detection mode 0 - switch to SIM slot1 (factory default) 1 - switch to SIM slot2
AT#SIMDET?	Read command reports the currently selected SIM Detection Mode in the format: **#SIMDET: <mode>,<simin>** where:

#SIMDET - SIM Detection Mode	
	\<mode\> - SIM Detection mode, as before **\<simin\>** - SIMIN pin real status 0 - SIM not inserted 1 - SIM inserted NOTE: If no SIMIN pin supported in product, **\<simin\>** will always be '0'.
AT#SIMDET=?	Test command returns the supported range of values for parameter **\<mode\>**

5.6.1.5. SIM Presence Status - #SIMPR

#SIMPR – SIM Presence Status	

AT#SIMPR=
[\<mode\>]
	Set command enables/disables the SIM Presence 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#SIMPR?**
	
	 1 - enabled; the ME informs the active SIM status change through the following unsolicited indication:
	
	    #SIMPR: \<active_SIM\>,\<SIMIN status\>
	
	    where:
	    \<active_SIM\> - current active SIM slot
	    0 - SIM slot1
	    1 - SIM slot2
	    \<SIMIN 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, both SIM slot1 and slot2 status, in the format: **#SIMPR: \<mode\>,0,\<SIMIN status\>\<CR\>\<LF\>** **#SIMPR: \<mode\>,1,\<SIMIN status\>**

#SIMPR – SIM Presence Status	
	NOTE: If no SIMIN pin supported in product, **<status>** will always be '0'.
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

5.6.1.6. GPIO SIMIN Configuration - #SIMINCFG

#SIMINCFG – SIMIN pin configuration	

**AT#SIMINCFG=
<GPIO_pin>,
<SIMIN_det_mode>**
	Set command sets SIMIN pin status for SIM detection.
	
	Parameter:
	
	<GPIO_pin> - GPIO pin number:
	  1 - GPIO SIMIN pin of SIM slot1
	  2 - GPIO SIMIN pin of SIM slot2
	
	<SIMIN_det_mode> - Status of SIMIN pin for SIM detection:
	  0 - SIMIN pin to GND when SIM is inserted (factory default);
	    Pin direction is INPUT, enable Pull-Up.
	  1 - SIMIN pin to GND when SIM is NOT inserted;
	    Pin direction is INPUT, enable Pull-Down.
	
	Note: The setting is stored in NVM and available at next reboot.

AT#SIMINCFG?	Read command reports the selected GPIO pin in the format: **#SIMINCFG: 1,<SIMIN_det_mode><CR><LF>** **#SIMINCFG: 2,<SIMIN_det_mode>** NOTE: If SIMIN pin is not connected, the hot-swap function cannot be supported.
AT#SIMINCFG=?	Test command returns the supported range of values for parameter **<GPIO_pin>** and **<SIMIN_det_mode>**.

#SIMINCFG – SIMIN pin configuration

Example	SIM is inserted in card slot1. The SIMIN is GND when SIM is inserted.
	AT#SIMINCFG=1,0
	OK
	AT#SIMINCFG=2,0
	OK
	AT#REBOOT
	OK
	AT#SIMPR?
	#SIMPR: 0,0,1
	#SIMPR: 0,1,0
	OK
	Remove SIM in card slot1.
	AT#SIMPR?
	#SIMPR: 0,0,0
	#SIMPR: 0,1,0
	OK
	SIM is inserted in card slot1. The SIMIN is GND when SIM is not inserted.
	AT#SIMINCFG=1,1
	OK
	AT#SIMINCFG=2,1
	OK
	AT#REBOOT
	OK
	AT#SIMPR?
	#SIMPR: 0,0,1
	#SIMPR: 0,1,0
	OK
	Remove SIM in card slot1.
	AT#SIMPR?
	#SIMPR: 0,0,0
	#SIMPR: 0,1,0

#SIMINCFG – SIMIN pin configuration	
	OK

5.6.1.7. Hot-Swap Enable - #HSEN

#HSEN – Hot-Swap Enable	

AT#HSEN=
<mode>,<slot>
	Set command enables/disables the hot-swap function on SIM slot.
	
	Parameter:
	<mode> - Hot-swap mode
	  0 - disable (factory default)
	  1 - enable
	
	<slot> - SIM slot
	  0 - SIM slot 1
	  1 - SIM slot 2
	
	Note: The setting is stored in NVM and available at next reboot.

AT#HSEN?	Read command reports the hot-swap status on SIM slot, in the format: **#HSEN: <mode>,0<CR><LF>** **#HSEN: <mode>,1** NOTE: If SIMIN pin is not connected, the hot-swap function cannot be supported.
AT#HSEN=?	Test command reports the supported range of values for parameter **<mode>** and **<slot>**.
Example	SIMIN pin is connected and SIM is inserted in SIM slot1. AT#HSEN? #HSEN: 0,0 #HSEN: 0,1 OK AT#SIMPR? #SIMPR: 1,0,1

#HSEN – Hot-Swap Enable	
	#SIMPR: 1,1,0 OK Enable the hot-swap function of SIM slot1. AT#HSEN=1,0 OK AT#REBOOT OK AT#HSEN? #HSEN: 1,0 #HSEN: 0,1 OK Remove SIM card on SIM slot 1. #SIMPR: 0,0 Insert SIM card on SIM slot 1. #SIMPR: 0,1

5.6.1.8. Reboot - #REBOOT

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

5.6.1.9. Software Shut Down - #SHDN

#SHDN - Software Shutdown	
AT#SHDN	Execution command causes device detach from the network and shut down. Before definitive shut down an **OK** response is returned.

#SHDN - Software Shutdown	
	Note: after the issuing of this command any previous activity is terminated and the device will not respond to any further command. Note: The maximum time to shutdown the device, completely is 25 seconds.
AT#SHDN=?	Test command returns the OK result code.

5.6.1.10. Hardware Identification - #HWREV

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

5.6.1.11. 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:
	  a SIM Application Toolkit enabled on user interface 0 if not previously enabled on a different user interface
	   b UMTS band 1900MHz(FDD II) and 850MHz(FDD V) enabled.

AT#ENS?	Read command reports whether the ENS functionality is currently 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>**.

#ENS – Enhanced Network Selection	
Reference	AT&T Device Requirements

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

#EONS - Enable URC of Enhanced Operator Name String	

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

AT#EONS?	Read command returns the current selected parameter in the format: **#EONS: <ena>[,<net>]** Note: Name string is shown only when network service is available.
AT#EONS=?	Test command returns the supported range of values of parameters **<ena>**.

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

#GPIO - General Purpose Input/Output Pin Control	
AT#GPIO=[<pin>, <mode>[,<dir>[,< save]]]	Execution command sets the value of the general purpose output pin **GPIO<pin>** according to **<dir>** and **<mode>** parameter. Not all configuration for the three parameters are valid. Parameters:

#GPIO - General Purpose Input/Output Pin Control
<pin> - GPIO pin number; supported range is from 1 to a value that depends on the hardware.

<mode> - its meaning depends on <dir> setting:

0 - no meaning if <dir>=0 - INPUT
  - output pin cleared to 0 (**Low**) if <dir>=1 - OUTPUT
1 - no meaning if <dir>=0 - INPUT
  - output pin set to 1 (**High**) if <dir>=1 - OUTPUT
2 - Reports the read value from the input pin if <dir>=0 - INPUT
  - Reports the read value from the input pin if <dir>=1 - OUTPUT
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

<save> - GPIO pin save configuration
 0 – pin configuration is not saved
 1 – pin configuration is saved

Note: if values of <dir> is set in output and save omitted then it is set automatically in input on next power cycle.

Note: when <mode>=2 (and <dir> is omitted) the command reports the direction and value of pin **GPIO<pin>** in the format:

#GPIO: <dir>,<stat>[,<mode>]

where:
<dir> - current direction setting for the **GPIO<pin>**

Note: <dir>=5 - "ALT6" value is valid for all GPIOs as "Fast power down". This value is only possible to set by #FASTSHDN (see #FASTSHDN)

<stat>

• logic value read from pin **GPIO<pin>** in the case the pin <dir> is set to input; |

#GPIO - General Purpose Input/Output Pin Control	
	• 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. \<**mode**\> 0 - INPUT (Default Pull-Down) 1 - OUTPUT 3 - INPUT, enable Pull-Up 4 - INPUT, enable Pull-Down Note: while using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and shall be avoided.
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\>**, **\<mode\>, \<dir\>, \<save\>**
Example	AT#GPIO=3,0,1 OK AT#GPIO=3,2 #GPIO: 1,0 OK AT#GPIO=4,1,1 OK AT#GPIO=4,0,0 OK

#GPIO - General Purpose Input/Output Pin Control	
	AT#GPIO=4,2
	#GPIO: 0,1
	OK

5.6.1.14. Temperature Monitor - #TEMPSENS

#TEMPSENS – Temperature monitor	

AT#TEMPSENS=
<mod>[,<interval
>]
	Set command sets the operation of the internal temperature monitor
	
	Parameters:
	<mod>
	0 – disables the periodic reporting (factory default)
	1 – enables the periodic reporting
	2 – instantaneous reporting of the Temperature
	
	<interval>
	duration in seconds of the interval between next measurement. It has meaning only if **<mod>** is 1.
	
	the unsolicited message is in the format:
	
	    #TEMPSENS: <sensor>,<value>
	
	    where:
	    <sensor> - temperature sensor name
	    <value> - actual temperature expressed in Celsius degrees

AT#TEMPSENS?	Read command reports the current parameter settings for **#TEMPSENS** command in the format: **#TEMPSENS**: < mod >,<interval>
AT#TEMPSENS= ?	Test command reports supported range of values for parameters <mod> and <interval>.
Example	AT#TEMPSENS=2

#TEMPSENS – Temperature monitor	
	#TEMPSENS: TSENS2,29
	#TEMPSENS: PA_THERM0,30
	#TEMPSENS: PA_THERM1,30
	OK

5.6.1.15. Select Band - #BND

#BND – Select Band	

AT#BND=
<GSM band>
[,<UMTS band>
[,<LTE band>]]
	Set command selects the current GSM , UMTS and LTE bands.
	
	Parameter
	<GSM band>:
	  0 - GSM 900MHz + DCS 1800MHz (default value depending on product)
	  1 - GSM 900MHz + PCS 1900MHz
	  2 - GSM 850MHz + DCS 1800MHz
	  3 - GSM 850MHz + PCS 1900MHz
	  4 - GSM 900MHz + DCS 1800MHz + PCS 1900MHz
	  5 - GSM 850MHz + GSM 900MHz + DCS 1800MHz + PCS 1900MHz
	
	<UMTS band>:
	  0 - 2100MHz (FDD I)
	  1 - 1900MHz (FDD II)
	  2 - 850MHz (FDD V)
	  3 - 2100MHz (FDD I) + 1900MHz (FDD II) + 850MHz (FDD V)
	  4 - 1900MHz (FDD II) + 850MHz (FDD V) (default value depending on product)
	  5 - 900MHz (FDD VIII)
	  6 - 2100MHz (FDD I) + 900MHz (FDD VIII)
	  7 - 1700MHz (FDD IV)
	  8 - 2100MHz (FDD I) + 850MHz (FDD V)
	  9 - 2100MHz (FDD I) + 900MHz (FDD VIII) + 850MHz (FDD V)
	  10 - 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V)
	  11 - 2100MHz (FDD I) + 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) + 900MHz (FDD VIII)
	(default value depending on product)
	  12 - 2100MHz (FDD I) + 1800MHz (FDD III) + 850MHz (FDD V) +

	900MHz (FDD VIII)
	13 - 1800MHz (FDD III)
	14 - 2100MHz (FDD I) + 1800MHz (FDD III) + 850MHz (FDD V)
	15 - 1800MHz (FDD III) + 850MHz (FDD V)
	16 - 2100MHz (FDD I) + 1900MHz (FDD II) + 1800MHz (FDD III) + 1700MHz (FDD IV) + 850MHz (FDD V) + 900MHz (FDD VIII)
	<LTE band>
	1 B1 2 B2 4 B3 8 B4 10 B5 40 B7 80 B8 800 B12 1000 B13 10000 B17 80000 B20 1000000 B25 2000000 B26 8000000 B28 10000000 B29 20000000 B30 2000000000 B38 8000000000 B40 10000000000 B41 1A03B0918DF B1+B2+B3+B4+B5+B7+B8+B12+B13+B17+B20+B25+B26+B28+B29+B30+B38+B40+B41 (default value depending on product)
	Note: This setting is maintained even after power off. <GSM band>, <UMTS band> parameter is decimal value. <LTE band> parameter is hex format value and band set should be entered In HEX format without "0x".
	Note: not all products support all the values of parameter **<GSM band>**: please refer to test command to find the supported range of values. Note: not all products support all the values of parameter **<UMTS band>**: please refer to test command to find the supported range of values. Note: not all products support all the values of parameter **<LTE band>**: please refer to test command to find the supported range of values.

		LTE	WCDMA	GSM

Note: for 4G only product use fixed unused value 0 for **<GSM band>** and
< UMTS band> parameters.
Note: for 4G/3G only product use fixed unused value 0 for **<GSM band>** parameter.
Note: for 4G/2G only product use fixed unused value 0 for **< UMTS band>** parameter.

Note : Supported band for each network provider.

	LTE	WCDMA	GSM
Generic	1,2,3,4,5,7,8,12,13,17,20, 25,26,28,29,30, 38,40,41,66	1,2,4,5,8	Not support
AT&T	2,4,5,12,29,30, 66	2,5	Not support
Verizon	2,4,5,13,66	Not support	Not support
Sprint	2,4,5,12,25,26, 41	Not support	Not support

Note : Currently, B66 always enable.

AT#BND?	Read command returns the current selected band in the format: **#BND: <GSM band>, < UMTS band>,<LTE band>**
AT#BND=?	Test command returns the supported range of values of parameters **<GSM band>**, **< UMTS band> and <LTE band>**. LTE bands shown as maximal bit mask for model in HEX. Example: AT#BND=? #BND: (0),(1,2,4),(3000081A) for AT&T OK ->3000081A LTE bit mask means all combinations of next bands could be accepted by SET command: 2 B2 8 B4 10 B5 800 B12 10000000 B29 20000000 B30

Example	AT#BND?
	#BND: 0,11,1A03B0918DF (for Generic)
	OK
	AT#BND?
	#BND: 0,4,3000081A (for AT&T)
	OK
	AT#BND?
	#BND: 0,0,101A (for Verizon)
	OK
	AT#BND?
	#BND: 0,0,1000300081A (for Sprint)
	OK

5.6.1.16. 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 RX Diversity(default value).
	<DARP_mode>
	DARP mode
	      0 - DARP not supported (default value)
	      (It has no effect and is included only for backward compatibility)
	      1 - DARP phase 1
	
	Note : The values set by command are directly stored in NVM.
	      They are available at next power on.
	      The LM940 module does NOT support GSM tech, so DARP mode
	      is not support.
	      .Case of #RXTOGGLE already set "1", #RXDIV don't set "1"
	      (Error return).

AT#RXDIV?	Read command reports the currently selected **<DIV_enable>** and **<DARP_mode>**parameters in the format: **#RXDIV:<DIV_enable>,<DARP_mode>**
AT#RXDIV=?	Test command reports the supported range of values for parameters **<DIV_enable>** and **<DARP_mode>**

5.6.1.17. Swap 3G-RX from main to diversity - #RXTOGGLE

#RXTOGGLE - swap 3G-RX from main to diversity	

AT#RXTOGGLE= <TOGGLE_enable>	Set command moves the 3G-RX receiver from the main antenna to the diversity antenna
	
	Parameters:
	<TOGGLE_enable>
	  0 – set the RX to the main antenna (default value)
	  1 – set the RX to the diversity antenna
	
	Note:
	1. Please disable usage of two antennas (AT#RXDIV=0) before swap antennas.
	2. Case of Diversity receiver path(RD) already set(#RXDIV=1), #RXTOGGLE command don't set "1"(Error return).
	3. The values set by command are directly stored in NVM.
	4. They are available at next power on.(Qualcomm Limitation.)

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.
Example:	AT#RXDIV? #RXDIV: 1,1 AT#RXTOGGLE=1 (When RXDIV=1, RXTOGGLE command return ERROR.) ERROR AT#RXDIV=0 *disable the RX Diversity* OK AT#RXTOGGLE=1 *set the RX to the diversity antenna*

	OK
	AT#REBOOT *reboot the module*
	OK
	AT+COPS = 0 *register to the 3G network*
	OK
	AT+CREG =1 *enable network registration unsolicited result code*
	OK
	AT+CREG? *read **<mode>** and **<stat>** parameters*
	+CREG: 1,1
	OK

5.6.1.18. Enable LTE RX Diversity - #LRXDIV

#LRXDIV – Enable LTE RX Diversity	
AT#LRXDIV= **<Ldiv_enable>**	This command enables or disables LTE Rx Diversity and moves the LTE-RX receiver from the main antenna to the diversity antenna. Parameters: **< Ldiv_enable >** 0 - Disables the LTE RX Diversity. (Only use Rx0) 1 - Enables the LTE RX Diversity. (Use Rx0 and Rx1, Factory default) 2 - Set the RX to the diversity Antenna. (only use Rx1) Note: Rx0 (Main Antenna), Rx1 (Diversity Antenna) Note: The value set by command operate both real time and power cycle. Note: This command only have to use for the purpose of test. Note :

	LRXDIV = 0	LRXDIV = 1	LRXDIV = 2
Rx0	Enable	Enable	Disable
Rx1	Disable	Enable	Enable
TX	Enable	Enable	Enable

#LRXDIV = 0: Use Main Antenna for RX/TX and Diversity Antenna is disabled

#LRXDIV = 1: Use Main Antenna for RX/TX and Diversity Antenna for RX.

	#LRXDIV = 2: Main Antenna is disabled for RX and used for only TX. Use Diversity Antenna for RX.
AT#LRXDIV?	Read command reports the currently selected **< Ldiv_enable >** parameters in the format: **#LRXDIV: < Ldiv_enable >**
AT#LRXDIV=?	Test command reports the supported range of values for parameters **<Ldiv_enable>.**

5.6.1.19. Configure Fast Power Down - #FASTSHDN

#FASTSHDN – Configure fast power down	

**AT#FASTSHDN=
[<mode>[,<pin>]]**
	Set command configure fast power down
	
	Parameter:
	<mode> - enables/disables fast power down.
	 0 – disables (factory default)
	 1 – enables on GPIO event
	
	<pin> - GPIO number used for fast power down event monitoring.
	        Valid range is "any input pin"(see "Hardware User's Guide")
	        This parameter used when **<mode>** is 1.
	
	Module enter power off autonomously if fast power down is enabled and event monitoring GPIO goes to low after modem boot done.
	
	Note: All configured value applied after reboot.
	Note: All configured value stored in NVM and available on following reboot.
	Note: **It has highest priority than other functions when fast power down enabled and GPIO is used as fast power down event monitoring. Customer should not use GPIO for other function**.

AT#FASTSHDN	Execution command for perform immediately fast power down regardless to the GPIO status or enabled status.

#FASTSHDN – Configure fast power down	
AT#FASTSHDN?	Read command returns the saved value in the format: **#FASTSHDN: \<mode\>,\<pin\>**
AT#FASTSHDN= ?	Test command returns the range for the parameters **\<mode\>** and **\<pin\>**

5.6.1.20. Disable Voice Call - #VCDISABLE

#VCDISABLE – Disable Voice Call	
AT#VCDISABLE= \<type\>	Set command set the incoming voice call function disable. Parameter: **\<type\>** 0 – Incoming call allowed. 1 – Ignore paging. 2 – Reject the voice call with cause code 88. (default) Note) At Generic version, a default value is 0. Note) The setting is saved in NVM, will affect after rebooting. Note) When set **\<type\>** by 1, modem may not be able to distinguish clearly whether paging is for Voice Call at the time of receiving the Paging Message.
AT#VCDISABLE?	Read command read a current value. **#VCDISABLE: \<type\>**
AT#VCDISABLE= ?	Test command reports the supported range.

5.6.1.21. Non-Volatile Memory Item Management - #NVIM

#NVIM – Non-Volatile memory Item Management	
AT#NVIM= \<item_num\>[,[\<data\>]]	Set command allows to write/read/remove the specific NV item Parameter: **\<item_num\>** NV item number

#NVIM – Non-Volatile memory Item Management	
	If NV item is an array format, NV item number must be passed in the following format : <item_num>_<array_index>.
	<array_index> count from zero, and zero-array-index can be omitted.
	For example,
	First array value of 50021 NV item is 50021 or 50021_0
	Third array value of 50021 NV item is 50021_2
	<data>
	The hex decimal format data to be written on NVM
	Note: "AT#NVIM=<item_num>,<data>" writes NV item with <data>.
	Note: "AT#NVIM=<item_num>" returns the current NV value in the format : #NVIM: <hex decimal value>.
	Note: "AT#NVIM=<item_num>," removes the NV item with the identification <item_num>
	Note: Don't use this command without Telit allowance. NV setting influences the behavior of the modem. It may result in the unexpected behavior.
AT#NVIM=?	Test command returns the **OK** result code.

Example	// Write NV 50013
	AT#NVIM=50013,00000001
	OK
	
	// Read NV 50013
	AT#NVIM=50013
	#NVIM: 00000001
	OK
	
	// Remove NV 50013
	AT#NVIM=50013,
	OK
	
	// Read NV 50021 , first array item
	AT#NVIM=50021 // or 50021_0 accepted
	#NVIM: XXXXXX
	OK
	
	// Read NV 50021 , third array item
	AT#NVIM=50021_2
	#NVIM: XXXXXX
	OK
	
	// Remove NV 50021, third array item
	AT#NVIM=50021_2,

#NVIM – Non-Volatile memory Item Management	
	OK

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

#TESTMODE – Enable Test Mode command in not signalling mode	

AT#TESTMODE= <command>	The command allows setting module in not signalling mode. The functionality has to be first activated by sending **AT#TESTMODE="TM"**, which sets the module in Test Mode. Only after this set, **AT#TESTMODE** can be used with the other allowed commands. To exit from Test Mode and go back to Operative Mode, the command **AT#TESTMODE ="OM"** has to be sent.
	
	Parameter:
	
	<command >:
	
	• "TM"→ forces the module in Test Mode;
	• "OM"→ forces the module in Operative Mode
	• "TCH"→starts the non-stop module transmission.
	
	     It enables TX power.
	
	• "ESC"→ exits the current non-stop sequence.
	
	     It must be used to stop TX transmission and RX chain disable.
	
	4G commands:
	
	• "SETLTEBAND <LTE Band>"→Sets the LTE band
	
	• "LTXBW"→ sets the TX bandwidth (default: 10Mhz).
	
	• "LRXBW"→ sets the RX bandwidth (default: 10Mhz).
	
	• "LTXBWENH <bw_idx>"→ sets the enhanced TX bandwidth.
	
	• "LRXBWENH <bw_idx>"→ sets the enhanced RX bandwidth.

bw_idx	Bandwidth
0	1.4Mhz
1	3Mhz

#TESTMODE – Enable Test Mode command in not signalling mode

2	5Mhz
3	10Mhz
4	15Mhz
5	20Mhz

- "CH < EARFCN UL>"→ sets the EUARFCN.

- Recommend "CH < EARFCN UL>"

LTE Band	EARFCN UL	Recommend
1	18000 ~ 18599	18300
2	18600 ~ 19199	18900
3	19200 ~ 19949	19575
4	19950 ~ 20399	20175
5	20400 ~ 20649	20525
7	20750 ~ 21449	21100
8	21450 ~ 21799	21625
12	23010 ~ 23179	23095
13	23180 ~ 23279	23230
17	23730 ~ 23849	23790
20	24150 ~ 24449	24300
25	26040 ~ 26689	26365
26	26690 ~ 27039	26865
28	27210 ~ 27659	27435
30	27660 ~ 27759	27710
38	37750 ~ 38249	38000
40	38650 ~ 39649	39150

41	39650 ~ 41589	40620
66	131972 ~ 132671	132322

- "LTXWAVEFORM"→ sets the WAVEFORM transmission.

- "LTXWAVEFORMENH <waveform_idx>
  ,<pusch_rbs>,<pucch_rbs>,<pusch_start_rb_index>"
  ->sets the enhanced WAVEFORM transmission.

waveform_idx	Waveform
0	LTE PUSCH
1	LTE PUCCH

RB type	Range
PUSCH_RBs	0-100
PUCCH_RBs	0-12
PUSCH_start_RB_index	0-225

- "LPASTATE" → sets the PA STATE to high gain state.

- "LPABIASSET" → sets the PA BIAS.

- "LTXGAIN <TXGAIN_IDX>"→ sets the value for desired TX power strength

- Recommend "TXGAIN_IDX" value -> Refer to Note 14

MODEL	BAND	TXGAIN _IDX	TX Power
LM940	1	66	

#TESTMODE – Enable Test Mode command in not signalling mode

2	66		
3	66		
4	67		
5	66		
7	66		
8	65		
12	70	23dBm	
13	70		
17	70		
20	68		
25	66		
26	68		
28	70		
30	70		
38	70		
40	71		
41	71		
66	67		

- "LNA4G" → sets 4G LNA GAIN STATE.

- "PRXRL4G" → reads the 4G Rx power level of primary path for selected channel. ->Refer to Note16.

- "DRXRL4G" → reads the 4G Rx power level of secondary path for selected channel. ->Refer to Note16.

3G commands:

#TESTMODE – Enable Test Mode command in not signalling mode

	• "SETWCDMABAND <Band>"→ sets the WCDMA band
	• "CH < UARFCN UL>"→ sets the UARFCN.

Band(3G)	UARFCN UL	recommend
1	9612 ~ 9888	9750
2	9262 ~ 9538	9400
4	1312 ~ 1513	1413
5	4132 ~ 4233	4183
8	2712 ~ 2863	2788

- "WTXWAVEFORM" → sets the WAVEFORM transmission.
- "WPASET" → sets the PA high gain.
- "WPABIASSET" → sets the PA BIAS.
- "TXPDM < TXPDM>" →Sets the value for desired TX power strength.

- Recommend "TXPDM" value. ->Refer to Note15.

MODEL	BAND	TXPDM	TX POWER
LM940	1	69	23dBm
	2	74	
	4	71	
	5	69	
	8	69	

- "LNA3G <LNA GAIN STATE>" → Sets 3G LNA GAIN STATE. <LNA GAIN STATE> value have to set 0.

#TESTMODE – Enable Test Mode command in not signalling mode

| | • "RL3G" → Provide the 3G Rx power level for selected channel.

   -Refer to the Note 16.

Note

- Bands support varies depending on the product

Note 1: This command should be checked individually.

Note 2: LM940 3G Support band – WCDMA 1,2,4,5, 8.

Note 3: LM940 4G Support band –

LTE 1,2,3,4,5,7,8,12,13,17,20,25,26,28,30,38,40,41,66

Note 4: In Test Mode, the other AT commands don't use.

Note 5: The Test Mode Status is stored in NVM

Note 6: "TM" command only can set on the Online mode.

Note 7: Must issuing #TESTMODE according to recommended test sequence.

Note 8: In case of "RL3G" command, we only guarantee readable RX range from -50dBm to -70dBm, because chipset has limitation.

Note 9: In case of "PRXRL4G" and "DRXRL4G" command, we only guarantee readable RX range from -50dBm to -70dBm, because chipset has limitation.

Note 10: In case of 4G, Signal generator CW(unmodulated)signal must be set

        Frequency to "Fc + 500khz".

        500khz offset from center frequency should be set to avoid DC(0 Hz)

Note 11: In case of 3G, Signal generator CW(unmodulated)signal must be set

        Frequency to "Fc + 200khz".

        200khz offset from center frequency should be set to avoid DC(0 Hz)

Note 12: After One band check is finished, must set the "ESC" and "OM"

Command.

Note 13: After #TESTMODE command process finish, modem have to reboot.

Note 14 : TXGAIN_IDX range is around 67~73 for 23dbm. It's not fixed value and will be fixed for each band. |

#TESTMODE – Enable Test Mode command in not signalling mode	
	Note 15 : TXPDM range is around 68~72. It's not fixed value and will be fixed for each band.
	Note 16 : PRXRL4G, DRXRL4G and RL3G have a difference +/- 5dbm based on input RX power.
	Note 17 : LRXBWENH, LTXBWENH and LTXWAVEFORMENH are enhanced command of LRXBW, LTXBW, LTXWAEFORM.
	Note 18 : If PUSCH is selected in LTXWAVEFORMENH (WAVEFORM_idx = 0),PUCCH_RBs value doesn't care. If PUCCH is selected in LTXWAVEFORMENH (WAVEFORM_idx = 1), PUSCH RBs and PUSCH start RB value doesn't care.
AT# TESTMODE?	Read command reports the currently selected **<command>** in the format: **#TESTMODE: <TestModeStatus>** Where: **<TestModeStatus>** can assume the following values: - 1 if the module is in Test Mode - 0 if the module is in Operative Mode
Example:	**< LM940 4G>** **1. Recommend 4G TX test sequence is below :** **Spectrum analyser setup:** **Frequency=1747.6Mhz** **RBW=1Mhz** **Span=100Mhz** **Manual Attenuation = 30dB** **Ref level Offset = depends on a cable loss** **Use the trigger video to fix the measurement** **Use the peak search marker** **LTE band 3 and set EARFCN = 19575,** **LTXGAIN = 66 and TX max power level about +23dBm.** - AT#TESTMODE="TM" - AT#TESTMODE="SETLTEBAND 3" - AT#TESTMODE="LTXBW" - AT#TESTMODE="LRXBW" - AT#TESTMODE="CH 19575" - AT#TESTMODE="TCH"

#TESTMODE – Enable Test Mode command in not signalling mode

	- AT#TESTMODE="LTXWAVEFORM"
	- AT#TESTMODE="LPASET"
	- AT#TESTMODE="LPABIASSET"
	- AT#TESTMODE="LTXGAIN 66"
	- AT#TESTMODE="ESC"
	- AT#TESTMODE="OM"
	- AT#REBOOT
	2. Recommend 4G RX test sequence is below :
	Signal generator setup:
	Frequency = 1842.5Mhz+500Khz offset
	Level = -70dBm
	CW is sent (RF on, MOD off)
	Offset = depends on a cable loss
	LTE band3 and set EARFCN = 19575,
	- AT#TESTMODE="TM"
	- AT#TESTMODE="SETLTEBAND 3"
	- AT#TESTMODE="LTXBW"
	- AT#TESTMODE="LRXBW"
	- AT#TESTMODE="CH 19575"
	- AT#TESTMODE="LNA4G"
	- AT#TESTMODE="PRXRL4G" – for check primary antenna path.
	PRXRL4G: -70 -> Return the 4G RX Level of primary antenna path
	- AT#TESTMODE="DRXRL4G" – for check secondary antenna path.
	DRXRL4G: -70 -> Return the 4G RX Level of secondary antenna path
	- AT#TESTMODE="ESC"
	- AT#TESTMODE="OM"
	- AT#REBOOT
	3. Recommend 4G TX enhanced test sequence is below
	LTE band 3 ,set EARFCN = 19575, set BW:10Mhz

#TESTMODE – Enable Test Mode command in not signalling mode

	LTXGAIN = 66 and TX max power level about +23dBm.
	- AT#TESTMODE="TM"
	- AT#TESTMODE="SETLTEBAND 3"
	- AT#TESTMODE="LTXBWENH 3"
	- AT#TESTMODE="LRXBWENH 3"
	- AT#TESTMODE="CH 19575"
	- AT#TESTMODE="TCH"
	- AT#TESTMODE="LTXWAVEFORMENH 0,12,0,19"
	- AT#TESTMODE="LPASET"
	- AT#TESTMODE="LPABIASSET"
	- AT#TESTMODE="LTXGAIN 66"
	- AT#TESTMODE="ESC"
	- AT#TESTMODE="OM"
	- AT#REBOOT
	< LM940 3G>
	1.Recommend 3G TX test sequence is below :
	Spectrum analyser setup:
	Frequency=1950Mhz
	RBW=1Mhz
	Span=100Mhz
	Manual Attenuation = 30dB
	Ref level Offset = depends on a cable loss
	Use the trigger video to fix the measurement
	Use the peak search marker
	3G band 1 and set UARFCN = 9750,
	3G TXPDM = 69 and TX max power level about +23dBm.
	- AT#TESTMODE="TM"
	- AT#TESTMODE="SETWCDMABAND 1"
	- AT#TESTMODE="CH 9750"
	- AT#TESTMODE="TCH"
	- AT#TESTMODE="WTXWAVEFORM"
	- AT#TESTMODE="WPASET"
	- AT#TESTMODE="WPABIASSET"
	- AT#TESTMODE="TXPDM 69"

#TESTMODE – Enable Test Mode command in not signalling mode	
	- AT#TESTMODE="ESC"
	- AT#TESTMODE="OM"
	- AT#REBOOT
	2. Recommend 3G RX test sequence is below :
	Signal generator setup:
	Frequency = 2140Mhz+200Khz offset
	Level = -70dBm
	CW is sent (RF on, MOD off)
	Offset = depends on a cable loss
	3G band 1 and set EARFCN = 9750,
	- AT#TESTMODE="TM"
	- AT#TESTMODE="SETWCDMABAND 1"
	- AT#TESTMODE="CH 9750"
	- AT#TESTMODE="LNA3G 0"
	- AT#TESTMODE="RL3G" – for check primary antenna path.
	RL3G: -70
	- AT#TESTMODE="ESC"
	- AT#TESTMODE="OM"
	- AT#REBOOT

5.6.1.23. 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:
	<number>
	<WCDMA>
	0 – it is the active set
	1 – it is the candidate set

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

#MONI – Cell Monitor	
	#MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm DRX:<drx>

c) When extracting data for an adjacent cell, the format is:

(WCDMA)

#MONI: PSC:<psc> RSCP:<rscp> Eclo:<ecio> UARFCN:<uarfcn> SCR:<scr>

(LTE)

(E-UTRAN intra-frequency and inter-frequency cells)

#MONI: RSRP:<rsrp> RSRQ:<rsrq> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm

where:

<netname> - name of network operator

<cc> - country code

<nc> - network operator code

<lac> - localization area code

<tac> - Tracking Area Code

<id> - cell identifier (hexadecimal character format)

<uarfcn> - UMTS assigned radio channel

<earfcn> - E-UTRAN Assigned Radio Channel

<dBm> - received signal strength in dBm

<psc> - primary synchronisation code

<rscp> - Received Signal Code Power in dBm

<ecio> - chip energy per total wideband power in dBm

<drx> - Discontinuous reception cycle length

<scr> - Scrambling code

<rsrp> - Reference Signal Received Power

<rsrq> - Reference Signal Received Quality

2. If the last setting done by #MONI is 7, the execution command produces a table-like formatted output, as follows:

(WCDMA network)

a) First row reports a set of information for the serving cell:

#MONI: <netname> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id>Eclo:<ecio> UARFCN:<uarfcn> PWR:<dBm> DRX:<drx> SCR:<scr> |

#MONI – Cell Monitor	
	b) the other rows report a set of information for all detected neighbour cells:
	#MONI: PSC:\<psc> RSCP:\<rscp> EcIo:\<ecio> UARFCN:\<uarfcn> SCR:\<scr>
	See above for parameters description.
	When the last setting done is AT#MONI=7, then the Read command indicates the above information for each of the cells in the neighbour of the serving cell, formatting them in a sequence of \<CR>\<LF>-terminated strings.
AT#MONI=?	Test command indicates the maximum number of cells, in a neighbour of the serving cell excluding it, from which we can extract GSM/WCDMA/LTE-related information, along with the ordinal number of the current selected cell, in the format:
	#MONI: (\<MaxCellNo>,\<CellSet>)
	where:
	\<MaxCellNo> - maximum number of cells, in a neighbour of the serving cell and excluding it, from which we can extract GSM-related information. This value is always 6.
	\<CellSet> - the last setting done with command #MONI.

5.6.1.24. Read Current Network Status - #RFSTS

#RFSTS – Read current network status			
AT#RFSTS	Execution command reads current network status, in the format:		
	(WCDMA network)		
	#RFSTS: \<PLMN>,\<UARFCN>,\<PSC>,\<Ec/Io>,\<RSCP>,\<RSSI>,\<LAC>,\<RAC>,[\<TXPWR>],\<DRX>,\<MM>,\<RRC>,\<NOM>,\<BLER>,\<CID>,\<IMSI>,\<NetNameAsc>,\<SD>,\<nAST>[,\<nUARFCN>,\<nPSC>,\<nEc/Io>]		
	Parameter	WCDMA Example	description

#RFSTS – Read current network status

	PLMN	"450 05"	Country code and operator code(MCC, MNC)
	UARFCN	10737	UMTS Assigned Radio Channel
	PSC	75	Active PSC(Primary Synchronization Code)
	Ec/Io	-7.0	Active Ec/Io(chip energy per total wideband power in dBm)
	RSCP	-74	Active RSCP (Received Signal Code Power in dBm)
	RSSI	-67	Received Signal Strength Indication
	LAC	2011	Localization Area Code
	RAC	11	Routing Area Code
	TXPWR	1	Tx Power (In traffic only)
	DRX	640	Discontinuous reception cycle Length(cycle length : display using ms)
	MM	19	Mobility Management
	RRC	0	Radio Resource Control
	NOM	1	Network Operator Mode
	BLER	005	Block Error Rate(005 means 0.5 %)
	CID	2825220	Cell ID(Hexadecimal character format).
	IMSI	"450050203 619261"	International Mobile Station ID
	NetNameA sc	"SKTeleco m"	Operation Name, Quoted string type
	SD	3	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 : CS+PS)
	nAST	3	Number of Active Set(Maximum 6)
	nUARFCN		UARFCN of n th active set

#RFSTS – Read current network status

	nPSC		PSC of n th active set
	nEc/Io		Ec/Io of n th active Set

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

Parameter	E-UTRAN Example	description
PLMN	"262 25"	Country code and operator code(MCC, MNC)
EARFCN	6400	E-UTRAN Assigned Radio Channel
RSRP	-99	Reference Signal Received Power
RSSI	-76	Received Signal Strength Indication
RSRQ	-7	Reference Signal Received Quality
TAC	40A5	Tracking Area Code
RAC	255	Routing Area Code
TXPWR	0	Tx Power (In traffic only)
DRX	640	Discontinuous reception cycle Length(cycle length : display using ms)
MM	19	Mobility Management
RRC	0	Radio Resource Control
CID	0000007	Cell ID(Hexadecimal character format).
IMSI	"262011242 110776"	International Mobile Station ID
NetNameAsc	" Telekom.de "	Operation Name, Quoted string type or "" if network name is unknown
SD	3	Service Domain (0: No Service, 1: CS only, 2: PS only, 3: CS+PS)
ABND	20	Active Band (1..63) 3GPP TS 36.101

Note: nAST - Number of active set, Maximum is 6.
Note: If nAST value is 1, it means that active set number 1. Module does not display after parameters of nAST.
Note: TXPWR of GSM network means 1 tx burst
Note: MM - Mobility Management States (for debug purpose only)

#RFSTS – Read current network status	
	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 24 - IMSI DETACH PENDING 25 - CONNECTION_RELEASE_NOT_ALLOWED **Note:** RR- Radio Resource States (for debug purpose only) 0 - INACTIVE 1 - GOING_ACTIVE 2 - GOING_INACTIVE 3 - CELL_SELECTION 4 - PLMN_LIST_SEARCH 5 - IDLE 6 - CELL_RESELECTION 7 - CONNECTION_PENDING 8 - CELL_REESTABLISH 9 - DATA_TRANSFER 10 - NO_CHANNELS 11 - CONNECTION_RELEASE 12 - EARLY_CAMPED_WAIT_FOR_SI 13 - W2G_INTERRAT_HANDOVER_PROGRESS 14 - W2G_INTERRAT_RESELECTION_PROGRESS 15 - W2G_INTERRAT_CC_ORDER_PROGRESS 16 - G2W_INTERRAT_RESELECTION_PROGRESS 17 - WAIT_FOR_EARLY_PSCAN 18 - GRR 19 - G2W_INTERRAT_HANDOVER_PROGRESS 21 - W2G_SERVICE_REDIRECTION_IN_PROGRESS 22 - RESET 29 - FEMTO 30 - X2G_RESEL 31 - X2G_RESEL_ABORTED 32 - X2G_REDIR 33 - G2X_REDIR

#RFSTS – Read current network status	
	34 - X2G_CGI 35 - X2G_CCO_FAILED 36 - X2G_CCO_ABORTED 37 - X2G_CCO_FAILED_ABORTED 40 - RR_CELL_SELECTED_ACQUIRE_SI 41 - RR_STATE_MAX **<RRC>** - Radio Resource Control state for 3G (for debug purpose only) 0 - IDLE 2 - CELL FACH 3 - CELL DCH 4 - CELL PCH 5 - URA PCH **<RRC>** - Radio Resource Control state for 4G (for debug purpose only) 0 - IDLE 2 - CELL DCH
AT#RFSTS=?	Test command returns the OK result code.

5.6.1.25. Serving Cell Information - #SERVINFO

#SERVINFO – Serving Cell Information	
AT#SERVINFO	Execution command reports information related serving cell, in the format: **<WCDMA>** #SERVINFO: <UARFCN>, <dBM>, <NetNameAsc>,<NetCode>, <PSC>,<LAC>,<DRX>,<SD>,<RSCP>, <NOM>,<RAC> **<LTE>** #SERVINFO:<EARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<CID>,<TAC>,<DRX>,<SD>,<RSRP> where: <NetNameAsc> - operator name, quoted string type

#SERVINFO – Serving Cell Information	
	<NetCode> - country code and operator code, hexadecimal representation
	<LAC> - Localization Area Code
	<RAC> - Routing Area Color Code
	<UARFCN> - UMTS ARFCN of the serving cell
	<PSC> - Primary Synchronisation Code
	<DRX> - Discontinuous reception cycle length
	<SD> - Service Domain
	0 – No Service
	1 – CS Only
	2 – PS Only
	3 – CS & PS
	<RSCP> - Received Signal Code Power in dBm
	<EARFCN> - E-UTRAN ARFCN of the serving cell
	<CID> - Cell Identifier
	<TAC> - Tracking Area Code
	<RSRP> - Reference Signal Received Power
AT#SERVINFO=?	Test command returns the OK result code.

5.6.1.26. Network Timezone - #NITZ

#NITZ – Network Timezone	

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

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

#NITZ – Network Timezone	
AT#NITZ=?	Test command returns supported values of parameters **<val>** and **<mode>**.

5.6.1.27. Tune USB 3.0 PHY

#USB3TUNE – Tune USB 3.0 PHY	
AT#USB3TUNE=< emp>,<drv>	This command is for tuning USB 3.0 PHY. Parameters: **<emp>:** Description: Adjusts the Tx output post cursor level. The value of this parameter should be one of below table. <table><tr><td>Dec</td><td>De-emphasis(dB)</td></tr><tr><td>0 (default)</td><td>0.0</td></tr><tr><td>1</td><td>-0.2</td></tr><tr><td>2</td><td>-0.5</td></tr><tr><td>3</td><td>-0.9</td></tr><tr><td>4</td><td>-1.0</td></tr><tr><td>5</td><td>-1.4</td></tr><tr><td>6</td><td>-1.8</td></tr><tr><td>7</td><td>-2.0</td></tr><tr><td>8</td><td>-2.4</td></tr><tr><td>9</td><td>-2.8</td></tr><tr><td>10</td><td>-3.0</td></tr><tr><td>11</td><td>-3.4</td></tr><tr><td>12</td><td>-3.9</td></tr><tr><td>13</td><td>-4.2</td></tr><tr><td>14</td><td>-4.7</td></tr></table>

#USB3TUNE – Tune USB 3.0 PHY		
	15	-5.3
	16	-5.9
	17	-6.2
	18	-6.8
	19	-7.5
	20	-7.9
	21	-8.7
	22	-9.7
	23	-10.2
	24	-11.2
	25	-12.4
	26	-13.1
	27	-14.7
	28	-16.6
	29	-17.7
	30	-20.5
	31	-25.0

<drv>:

Description: Select Tx drive level.

The value of this parameter should be one of below table.

Dec	Vp-p(mV)	% change
0 (default)	975.0	0
1		-2
2		-5
3		-9

#USB3TUNE – Tune USB 3.0 PHY			
	4		-11
	5		-15
	6		-19
	7		-20
	8		-24
	9		-27
	10		-29
	11		-33
	12		-36
	13		-38
	14		-42
	15		-45
	This tune data is going to be applied after target reboot.		
AT#USB3TUNE?	Read command reports the currently selected parameters in the format: **#USB3TUNE : <emp>,<drv>**		
AT#USB3TUNE=?	Reports the supported range of values for parameter(s) **<emp>** and **<drv>**. **#USB3TUNE: (0-31),(0-15)**		
Reference			

5.6.1.28. LTE Carrier Aggregation Frequencies and Combinations - #LCFC

#LCFC – LTE Carrier Aggregation Frequencies and Combinations	
AT#LCFC	Execution command indicates supported CA frequencies and Combinations of current mode. **#LCFC: <mode>,<Freq>,<combo>**

#LCFC – LTE Carrier Aggregation Frequencies and Combinations	

	<mode> - current mode
	  0 – 5
	  0: GENERIC
	  1: ATT
	  2: VZW
	  3: EU
	  4: AU
	  5: Sprint
	
	<freq> - Supported frequencies
	  1(2100): Band 1
	  2(1900): Band 2
	  3(1800): Band 3
	  4(1700): Band 4
	  5(850): Band 5
	  7(2600): Band 7
	  8(900): Band 8
	  12(700a): Band 12
	  13(700c): Band 13
	  17(700b): Band 17
	  20(800): Band 20
	  25(1900): Band 25
	  26(850): Band 26
	  28(700): Band 28
	  29(700d): Band 29
	  30(2300): Band 30
	  38(TD2600): Band 38
	  40(TD2300): Band 40
	  41(TD2500): Band 41
	  66(1700): Band 66
	
	<combo> - Supported combinations
	Note: Supported CA combination is referred to Appendix 7.1.

AT#LCFC=?	Test command returns the OK result code.

5.6.1.29. LTE Carrier Aggregation enable and disable - #CACTL

#CACTL – LTE Carrier Aggregation enable and disable	

AT#CACTL=<mode>	This command enable / disable the LTE Carrier Aggregation.
	
	#CACTL: <mode>
	
	Parameter:
	<mode>
	   0 – CA disable
	   1 – CA enable (default)
	
	Note: The value set by command operate after modem reboot.

AT#CACTL?	Read command reports the currently selected **<enable>** in the format: **#CACTL: <mode>**
AT#CACTL=?	Test command reports the supported range of values.

Example:	.For Carrier Aggregation disable
	  AT#CACTL=0
	  AT#REBOOT
	.For Carrier Aggregation enable
	  AT#CACTL=1
	  AT#REBOOT

5.6.1.30. Select language - #LANG

#LANG – select language	

AT#LANG=<lan>	Set command selects the currently used language for displaying different messages
	
	Parameter:
	<lan> - selected language
	  "en" - English (factory default)
	  "it" - Italian
	  "de" - German

AT#LANG?	Read command reports the currently selected <lan> in the format: **#LANG: <lan>**
AT#LANG=?	Test command reports the supported range of values for parameters **<lan>**

5.6.1.31. Switch USB configuration - #USBSWITCH

#USBSWITCH – Switch USB configuration between Super-speed(3.0) and High-speed(2.0) mode	
AT#USBSWITCH =<mode>	Set command switchs USB configuration between Super-speed(3.0) and High-speed(2.0) mode. Parameter: **<mode>** 0 - Support USB3.0 mode (default) 1 - Support USB2.0 mode Note: Manually reboot is required after changing USB configuration. The setting be maintained for both firmware updates and firmware switches. Note: After "AT#REBOOT" or "AT#SHDN" command is issued, a serial port need to do close in terminal program such as procomm or teraterm because a Yellow Bang error appears once with Windows OS.
AT#USBSWITCH ?	Read command reports the currently selected <mode> in the format: **#USBSWITCH: <mode>**
AT#USBSWITCH =?	Test command reports the supported range of values for parameters **<mode>**

5.6.1.32. Get firmware status - #GETFW

#GETFW – Get firmware status	
AT#GETFW	Execution command return all modem carrier firmware information in the following format HOST FIRMWARE : <Host Version> SLOT STATUS CARRIER VERSION TMCFG <modem carrier firmware 1 > <modem carrier firmware 2 > … <modem carrier firmware N > MODEM CONFIG : <The maximum value of M> SLOT STATUS CARRIER VERSION SIZE <modem carrier configuration 1 > <modem carrier configuration 2 > … <modem carrier configuration M >

#GETFW – Get firmware status	
	Note: MODEM CONFIG is optional information. 　　　This information field will be shown only if it supported.
AT#GETFW?	Read command returns information of the activated modem carrier firmware **#GETFW: <carrier name>, <ensim>** Parameters: **<carrier name>** : Actived modem carrier name string **<ensim>** : Firmwared enabled by SIM 　0 : Activated firmware manually 　1 : Activated fireware by SIM
AT#GETFW=?	Test command returns OK

5.6.1.33. Active firmware - #ACTIVEFW

#ACTIVEFW – Active firmware	
AT#ACTIVEFW=<op_mode>,<option>	Set command active the selected modem carrier firmware at <slot_idx>. If the specified modem carrier firmware selected, it return OK result. Power-cycle (reboot) action will be performed, automatically. And a new selected modem carrier firmware loaded at boot time. Parameter: **<op_mode>** 　0 : Active specific modem carrier firmware by SIM 　1 : Active specific modem carrier firmware by slot index 　2 : Active specific modem carrier firmware by carrier name 　3 : Active specific modem carrier firmware by version name **<option>** If **<op_mode>** is 0 <option> is not required. If **<op_mode>** is 1 　<option> is decimal number of slot index to active 1 : Active modem carrier firmware at slot 1 2 : Active modem carrier firmware at slot 2 … N : Active modem carrier firmware at slot N 　Where N is the maximum index for the modem firmware 　If **<op_mode>** is 2 <option> is string value of carrier name to active EX> "ATT" 　If **<op_mode>** is 3 <option> is string value of version name to active

#ACTIVEFW – Active firmware	
	EX> "24.01.010" **Note**: The SMS/Phonebook user data and SIM dependent information will remain regardless the carrier firmware switch. (SIM dependent information : <number> of +CSVM. etc)
AT#ACTIVEFW?	Read command returns information of the activated modem carrier firmware
AT#ACTIVEFW=?	Test command returns OK

5.6.1.34. Clear firmware - #CLEARFW

#CLEARFW – Clear firmware	
AT#CLEARFW=< op_mode>[,<opti on>]	Execution command clear modem carrier firmware from LM940 module Parameter: **<op_mode>** 0: clear all modem carrier firmware 1: clear specific modem carrier firmware by slot index 2: clear specific modem carrier firmware by carrier name 3: clear specific modem carrier firmware by version name **<option>** If **<op_mode>** is 0 There are no option field for <op_mode> 0 If **<op_mode>** is 1 <option> is decimal number of slot index to clear 2: clear modem carrier firmware at slot 2 … N: clear modem carrier firmware at slot N Note: Where N is the maximum index for the modem firmware If **<op_mode>** is 2 <option> is string value of carrier name to clear EX> "ATT" If **<op_mode>** is 3 <option> is string value of version name to clear EX> "24.01.010" Note: Slot 1 is fixed for "Generic" carrier image and cannot be erased by this command
AT#CLEARFW=?	Test command returns OK

5.6.1.35. Active firmware and display firmware - #FIRMWARE

#FIRMWARE-Firmware	
AT#FIRMWARE[=<mfw_idx>]	Set command load the selected modem carrier firmware. If the specified modem carrier firmware selected, it return OK result. Power-cycle (reboot) action will be performed, automatically. And a new selected modem carrier firmware loaded at boot time. Parameter: **<mfw_idx>** 1 : modem carrier firmware 1 2 : modem carrier firmware 2 … N : modem carrier firmware N Where N is the maximum index for the modem firmware

AT#FIRMWARE	Execution command return all firmware information in the following format
	
	HOST FIRMWARE : <Host Version>
	MODEM FIRMWARE : <The maximum value of N>
	INDEX STATUS CARRIER VERSION TMCFG LOC
	<modem carrier firmware 1 >
	<modem carrier firmware 2 >
	…
	<modem carrier firmware N >
	
	MODEM CONFIG : <The maximum value of M>
	INDEX STATUS CARRIER VERSION SIZE
	<modem carrier configuration 1 >
	<modem carrier configuration 2 >
	…
	<modem carrier configuration M >
	
	Note: MODEM CONFIG is optional information.
	    This information field will be shown only if it supported.
	Note: For versions 24.01.5X1, use the AT#FIRMERE command.
	    Since 24.01.5X2, AT#ACTIVEFW/#GETFW/#CELARFW

#FIRMWARE-Firmware	
	commands are available and #FIRMWARE has been replaced by AT#ACTIVEFW (refer to section 5.6.1.33)
AT#FIRMWARE?	Read command returns the activated modem firmware index #FIRMWARE: <mfw_idx>
AT#FIRMWARE= ?	Test command returns the list of supported carrier firmware index. #FIRMWARE: (1-N)

5.6.1.36. Show LTE CA Information - #CAINFO

#CAINFO – Show LTE CA Information	
AT#CAINFO?	This command indicates the LTE carrier aggregation information of PCC and SCC. **<On 2CA>** #CAINFO : <band_class>,<rx_channel>,<dl_bw>,<pci>,<rsrp>,<rssi>,<rsrq>,<sinr>,<tac>,<tx_power>,<uplink_modulation>,<downlink_modulation>,<band_class>,<rx_channel>,<dl_bw>,<pci>,<rsrp>,<rssi>,<rsrq>,<sinr>,<state>,<uplink_modulation>,<downlink_modulation> **<On 3CA>** #CAINFO : <band_class>,<rx_channel>,<dl_bw>,<pci>,<rsrp>,<rssi>,<rsrq>,<sinr>,<tac>,<tx_power>,<uplink_modulation>,<downlink_modulation>,<band_class>,<rx_channel>,<dl_bw>,<pci>,<rsrp>,<rssi>,<rsrq>,<sinr>,<state>,<uplink_modulation>,<downlink_modulation>,<band_class>,<rx_channel>,<dl_bw>,<pci>,<rsrp>,<rssi>,<rsrq>,<sinr>,<state>,<uplink_modulation>,<downlink_modulation> **Parameters :** <band_class>: LTE band class. (band number – band class) BAND 1 – 120 BAND 2 –121 BAND 3 – 122 BAND 4 – 123 BAND 5 – 124 BAND 6 – 125

#CAINFO – Show LTE CA Information	
	BAND 7 – 126
	BAND 8 – 127
	BAND 9 – 128
	BAND 10 – 129
	BAND 11 – 130
	BAND 12 – 131
	BAND 13 – 132
	BAND 14 – 133
	BAND 17 – 134
	BAND 33 – 135
	BAND 34 – 136
	BAND 35 – 137
	BAND 36 – 138
	BAND 37 – 139
	BAND 38 – 140
	BAND 39 – 141
	BAND 40 – 142
	BAND 18 – 143
	BAND 19 – 144
	BAND 20 – 145
	BAND 21 – 146
	BAND 24 – 147
	BAND 25 – 148
	BAND 41 – 149
	BAND 42 – 150
	BAND 43 – 151
	BAND 23 – 152
	BAND 26 – 153
	BAND 32 – 154
	BAND 125 – 155
	BAND 126 – 156
	BAND 127 – 157
	BAND 28 – 158
	BAND 29 – 159
	BAND 30 – 160
	BAND 66 – 161

#CAINFO – Show LTE CA Information
BAND 250 – 162

BAND 46 – 163

<rx_channel>: E-UTRA absolute radio frequency channel number of the serving cell.

Range: 0 to 65535.

<dl_bw>: Bandwidth. Values:

0 – 1.4 MHz bandwidth

1 – 3 MHz bandwidth

2 – 5 MHz bandwidth

3 – 10 MHz bandwidth

4 – 15 MHz bandwidth

5 – 20 MHz bandwidth

<pci>: Physical Cell Id.

Range : 0 to 503.

<rsrp>: Current RSRP.

Range : -44 to -140 dbm

<rssi>: Current RSSI.

Range : 0 to -120 dbm

<rsrq>: Current RSRQ.

Range : -3 to -20 dbm

<sinr>: Measured SINR.

Range : 0 to 250

<tac>: Tracking area code information for LTE.

<tx_power>: Current uplink TX power. The tx_power value is only meaningful when the device is in traffic. When there is no traffic, tx_power is "0".

Range : -50 to 33

#CAINFO – Show LTE CA Information	
	\<state\>: Current SCC state. 0 – INIT 1 – CONFIGURED 2 – ACTIVE \<uplink_modulation\> 0 – BPSK 1 – QPSK 2 – 16QAM 3 – 64QAM 4 – 256QAM 5 – UNKOWN \<downlink_modulation\> 0 – BPSK 1 – QPSK 2 – 16QAM 3 – 64QAM 4 – 256QAM 5 – UNKOWN Note: The first block from \<band_class\> to \<downlink_modulation\> is PCC information. The next information block which are from \<band_class\> to \<downlink_modulation\> is information of SCC. Additional SCC information could add in the rear of first SCC. If the LTE information of SCC is not valid, it always return 0. If it acquire the UMTS or GSM technology, this command will display "**ERROR**".
AT#CAINFO=?	Test command returns OK

5.6.1.37. LTE Antenna Ports Signals - #LAPS

#LAPS – LTE Antenna Ports Signals	
AT#LAPS?	Read command indicates RSRP and RSRQ signals in LTE separated antenna ports. **#LAPS: \<rsrp_0\>,\<rsrq_0\>,\<rsrp_1\>,\<rsrq_1\>** Where:

#LAPS – LTE Antenna Ports Signals	
	<rsrp_0> Reference Signal Received Power of antenna port 0
	<rsrq_0> Reference Signal Received Quality of antenna port 0
	<rsrp_1> Reference Signal Received Power of antenna port 1
	<rsrq_1> Reference Signal Received Quality of antenna port 1
	Note: Current reference signal receive power in dBm.(-44 – -140)
	Note: Current reference signal receive quality in dBm.(-3 – -20)
AT#LAPS?	Read command operates as execution command.
AT#LAPS=?	Test command returns OK

5.6.1.38. ICMP Ping Support - #ICMP

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

5.6.2.   GPS AT Commands

5.6.2.1. GPS Controller Power Management - $GPSP

$GPSP - GPS Controller Power Management	
AT$GPSP=<status>	Set command allows to manage power-up or down of the GPS controller
	Parameter:

$GPSP - GPS Controller Power Management	
	<status> 0 - GPS controller is powered down (default) 1 - GPS controller is powered up
AT$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>**
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**). The **$GPSP** and **$GPSSLSR** can't be used at same time. The current setting is stored through **$GPSSAV**.

5.6.2.2. GPS Reset - $GPSR

$GPSR - GPS Reset	
AT$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. It is available in controlled mode only. (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. It is available in controlled mode only. **2 - Warmstart** (No ephemeris): this option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The almanac is

$GPSR - GPS Reset	
	retained but the ephemeris is cleared. It is available in controlled mode only. **3 - Hotstart** (with stored Almanac and Ephemeris): the GPS receiver restarts by using the values stored in the internal memory of the GPS receiver; validated ephemeris and almanac. It is available in controlled mode only.
AT$GPSR=?	Test command reports the range of supported values for parameter **<reset_type>**
Example	AT$GPSR=0 OK
Note	'**Factory Reset**' performs the same operation as '**Coldstart**'. The <**reset_type**> sets the kind of start when GPS is activated through **$GPSP** or **$GPSSLSR** commands. The current setting is stored through **$GPSSAV.**

5.6.2.3. 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 NMEA port and defines which NMEA sentences will be available
	
	Parameters:
	
	<enable>
	
	0 - NMEA data stream de-activated (default)
	
	1 - NMEA data stream activated with the following unsolicited response
	
	syntax:
	
	    $GPSNMUN:<CR><NMEA SENTENCE><CR>
	
	2 - NMEA data stream activated with the following unsolicited response
	
	syntax:
	
	    <NMEA SENTENCE><CR>
	
	3 - dedicated NMEA data stream; it is not possible to send AT commands;
	
	with the escape sequence '+++' the user can return to command

$GPSNMUN - Unsolicited NMEA Data Configuration	
	mode
	<GGA> - Global Positioning System Fix Data
	0 - disable (default)
	1 – enable
	<GLL> - Geographic Position - Latitude/Longitude
	0 - disable (default)
	1 - enable
	<GSA> - GPS DOP and Active Satellites
	0 - disable (default)
	1 - enable
	<GSV> - GPS Satellites in View
	0 - disable (default)
	1 - enable
	<RMC> - Recommended Minimum Specific GPS Data
	0 - disable (default)
	1 - enable
	<VTG> - Course Over Ground and Ground Speed
	0 - disable (default)
	1 - enable
AT$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

$GPSNMUN - Unsolicited NMEA Data Configuration	
	Turn-off the unsolicited mode
	AT$GPSNMUN?
	$GPSNMUN: 1,0,0,1,0,0,0
	OK
	Give the current frame selected (GSA)
	The unsolicited message will be:
	$GPGSA,A,3,23,20,24,07,13,04,02,,,,,,2.4,1.6,1.8*3C
Note	If the **enable** is 3, it activates the NMEA Unsolicited streamings both the current dedicated port and NMEA port.
	The current setting is stored in the profile extended section.
Reference	NMEA 0183 Specifications

5.6.2.4. 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

$GPSACP - Get Acquired Position	
	E/W: East / West
	<hdop> - x.x - Horizontal Diluition of Precision (referred to GGA sentence)
	<altitude> - xxxx.x Altitude - mean-sea-level (geoid) in meters (referred to
	GGA sentence)
	<fix> -
	0 or 1 - Invalid Fix
	2 - 2D fix
	3 - 3D fix
	<cog> - ddd.mm - Course over Ground (degrees, True) (referred to VTG
	sentence)
	where:
	ddd - degrees
	000..360
	mm - minutes
	00..59
	<spkm> - xxxx.x Speed over ground (Km/hr) (referred to VTG sentence)
	<spkn> - xxxx.x- Speed over ground (knots) (referred to VTG sentence)
	<date> - ddmmyy Date of Fix (referred to RMC sentence)
	where:
	dd - day
	01..31
	mm - month
	01..12
	yy - year
	00..99 - 2000 to 2099
	<nsat> - nn - Total number of satellites in use (referred to GGA sentence)
	00..12
AT$GPSACP?	Read command has the same meaning as the Execution command
AT$GPSACP=?	Test command returns the **OK** result code
Example	AT$GPSACP

$GPSACP - Get Acquired Position	
	$GPSACP:080220.479,4542.82691N,01344.26820E,259.07,3,2.1 ,0.1,0.0,0.0,270705,09 OK
Reference	NMEA 0183 Specifications

5.6.2.5. 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

5.6.2.6. 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	If the GPS controller is powered up(see **$GPSP**), the GPS controller is powered down because the GPS parameters should be reset with facory default.

5.6.2.7. Unsolicited NMEA Extended Data Configuration - $GPSNMUNEX

$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration	
AT$GPSNMUNEX = <GNGNS>, <GNGSA>, <GLGSV>	Set command permits to activate an Unsolicited streaming of GNSS NMEA data (in NMEA extended format) through the NMEA port and defines which NMEA extended sentences will be available Parameters: **<GNGNS>** - GNSS Fix Data. 0 - disable (default)

$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration	
	1 - enable
	<GNGSA> - GNSS DOP and Active satellites
	0 - disable (default)
	1 - enable
	<GLGSV> - GLONASS satellites in view
	0 - disable (default)
	1 - enable
AT$GPSNMUNEX ?	Read command returns the NMEA extended sentences availability status, in the format:
	$GPSNMUNEX:**<GNGNS>,<GNGSA>, <GLGSV>**
AT$GPSNMUNEX =?	Test command returns the supported range of values for parameters
	<GNGNS>,<GNGSA>, <GLGSV>
Note	The NMEA Extended Data is displayed on NMEA port depending on **$GPSNMUN** setting.
	The current setting is stored in the profile extended section.
Example	AT$GPSNMUNEX =1,0,0
	OK
	These sets the GNGNS as available sentence in the unsolicited message
	AT$GPSNMUNEX?
	$GPSNMUNEX: 1,0,0
	OK
	Give the current frame selected (GNGNS)
	The unsolicited message will be:
	$GNGNS,080558.0,3731.306144,N,12655.784429,E,AN,09,1.0,68.0,18.0,,*5B
Reference	NMEA 0183 Specifications

5.6.2.8. GPS NVRAM Parameters Delete - $GPSNVRAM

$GPSNVRAM – GPS NVRAM Parameters Delete	
AT$GPSNVRAM= <bitfield>,<action >	Execution command used to delete the GPS information stored in NVRAM
	Parameters:

$GPSNVRAM – GPS NVRAM Parameters Delete	
	\<bitfield\> - in integer format. The assistance data mask for the type(s) of GPS-data to read/delete with the following meaning: 1 - Ephemeris 2 - Location 4 - Time 8 - Almanac **\<action\>** 0: Delete data described in bitfield
AT$GPSNVRAM?	Read command reports the current value of the **\<bitfield\>** parameter in the format: **$GPSNVRAM:\<bitfield\>**
AT$GPSNVRAM=?	Test command returns the sypported range of values for parameters **\<bitfield\>,\<action\>**
Example	AT$GPSNVRAM=15,0 OK
Note	The current setting if stored through **$GPSSAV**

5.6.2.9. 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. Note: The LM940 is supported as following, 1) 0 - 50 : 50m 2) 51 - 500 : 500m 3) 501 - 1800000 : 1km **\<vertic_accuracy\>** (vertical accuracy): 0 - 990, where 0 is highest accuracy and 990 is lowest accuracy in meters.

$GPSQOS – GPS Quality Of Service	
	Default is 990 in meters.
	Note: The LM940 isn't supported about **<vertic_accuracy>**. It has no effect and is included only for backward compatibility.
	<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.
	Note: The LM940 is supported by maximum 255 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).
	Note: The LM940 isn't supported about **< age_of_location_info >**. It has no effect and is included only for backward compatibility.
	<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
	Note: The LM940 isn't supported about **< location_type >**. It has no effect and is included only for backward compatibility.
	<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
	Note: The LM940 isn't supported about **< nav_profile >**. It has no effect and is included only for backward compatibility.
	< velocity_request> (velocity information is needed):
	0 - FALSE
	1 - TRUE (default)
	Note : The LM940 is always supported with TRUE about **< velocity_request>**. It has no effect and is included only for

$GPSQOS – GPS Quality Of Service	
	backward compatibility.
AT$GPSQOS?	Read command returns the current QoS values, in the format: AT$GPSQOS: **<horiz_accuracy>,<vertic_accuracy>,<rsp_time> ,<age_of_locat ion_info>,<location_type>,< nav_profile>,< velocity_request>**
AT$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 if stored through **$GPSSAV**

5.6.2.10. GPS Start Location Service Request - $GPSSLSR

$GPSSLSR – GPS Start Location Service Request	
AT$GPSSLSR = **<transport_proto col>** **[,<pos_mode>** **[,<client_id>,** **<clientid_type>** **[,<mlc_number>,** **<mlcnumber_typ e>** **[,<interval>** **[,<service_type_i d>** **[,<pseudonym_in dicator>]]]]]]]**	Command used to start the Receiver in Autonomous or A-GPS mode. Parameter: **<transport_protocol>**: 0 - C-Plane 1 - SUPL 2 - Invalid Note : If **<pos_mode** > is Autonomous the **<transport_protocol>** should be invalid. Note : If **<transport_protocol>** is C-Plane 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 - MS Assisted Based - Combination of MS-A and MS-B modes, location estimate computed both at UE and Network. Note : The LM940 isn't supported about MS Assisted Based. It has

$GPSSLSR – GPS Start Location Service Request

	no effect and is included only for backward compatibility.
	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: **<client_id>** is mandatory in case of A-GPS and the **<transport_protocol>** should be C-Plane.
	Note: The LM940 isn't supported about <**client_id>** because of not supporting the 3rd Part Location Transfer. It has no effect and is included only for backward compatibility.
	<clientid_type> :
	0 - MSISDN
	1 - Invalid (default)
	Note: **<client_id>** and **<clientid_type>** are mandatory for A-GPS mode.
	Note: The LM940 isn't supported about < **clientid_type >** because of not supporting the 3rd Part Location Transfer. It has no effect and is included only for backward compatibility.
	<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.
	Note: The LM940 isn't supported about < **mlc_number >** because of not supporting the 3rd Part Location Transfer. It has no effect and is included only for backward compatibility.
	<mlcnumber_type> :
	0 - MSISDN
	1 - Invalid (default)
	Note : **<mlc_number>** and **<mlcnumber_type>** are mandatory for A-GPS
	mode.
	Note: The LM940 isn't supported about **<mlcnumber_type >** because of not supporting the 3rd Part Location Transfer. It has no effect and is included only for backward compatibility.

$GPSSLSR – GPS Start Location Service Request

<table>
<tr><td></td><td>

\<interval\> :

0 - 7200: GPS reporting period in seconds (will be sent unsolicited).

Note: In the LM940, the GPS reporting period is not supported and the **\<interval\>** means times between fixes.

Note: If this value is not set, it is assumed to be 0.

Note: If this value is not 0, it means a tracking session.

Note: The Unsolicited NMEA sentences have to be enabled with the commands **$GPSNMUN**.

Note: The NMEA sentences for a immediate fix is generated before a final fix.

\<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.

Note: The LM940 isn't supported about **\<service_type_id\>**. It has no effect and is included only for backward compatibility.

\< pseudonym_indicator\> :

0 - FALSE (default) : display user name at the external client

1 - TRUE : display user name as anonymous at the external client

Note: The LM940 isn't supported about **\<pseudonym_indicator \>**. It has no effect and is included only for backward compatibility.

Note: Internal GPS for eCall and **$GPSP**, **$GPSSLSR** can't use at same time. If use internal GPS for eCall, **$GPSP** and **$GPSSLSR** command will display "**ERROR**"

If C-plane or Supl session is not successfully completed then an unsolicited indication reports the error cause in the following formats:

In case C-Plane errors,

$GPSSLSR: C-PLANE ERROR,\<error_code\>

In case SUPL errors,

$GPSSLSR: SUPL ERROR,\<error_code\>

In case GPS errors,

$GPSSLSR: ERROR,\<error_code\>

where

\<error_code\>
</td></tr>
</table>

$GPSSLSR – GPS Start Location Service Request	
	0 PDSM_PD_END_OFFLINE
	/* Phone Offline */
	1 PDSM_PD_END_NO_SRV
	/* No servcie */
	2 PDSM_PD_END_NO_CON
	/* No connection with PDE */
	3 PDSM_PD_END_NO_DATA
	/* No data available */
	4 PDSM_PD_END_SESS_BUSY
	/* Session Manager Busy */
	5 PDSM_PD_END_CDMA_LOCK
	/* Phone is CDMA locked */
	6 PDSM_PD_END_GPS_LOCK
	/* Phone is GPS locked */
	7 PDSM_PD_END_CON_FAIL
	/* Connection failure with PDE */
	8 PDSM_PD_END_ERR_STATE
	/* PDSM Ended session because of Error condition */
	12 PDSM_PD_END_TIMEOUT
	/* Timeout (viz., for GPS Search) */
	13 PDSM_PD_END_PRIVACY_LEVEL
	/* Conflicting reques for session and level of privacy */
	14 PDSM_PD_END_NET_ACCESS_ERR
	/* Could not connect to the Network */
	15 PDSM_PD_END_FIX_ERROR
	/* Error in Fix */
	16 PDSM_PD_END_PDE_REJECT
	/* Reject from PDE */
	17 PDSM_PD_END_TC_EXIT
	/* Ending session due to TC exit. */
	18 PDSM_PD_END_E911
	/* Ending session due to E911 call */
	19 PDSM_PD_END_SERVER_ERROR
	/* Added protocol specific error type */
	20 PDSM_PD_END_STALE_BS_INFO
	/* Ending because BS info is stale */

$GPSSLSR – GPS Start Location Service Request	
	21 PDSM_PD_END_VX_AUTH_FAIL
	/* VX lcs agent auth fail */
	22 PDSM_PD_END_UNKNWN_SYS_ERROR
	/* Unknown System Error */
	23 PDSM_PD_END_UNSUPPORTED_SERVICE
	/* Unsupported Service */
	24 PDSM_PD_END_SUBSRIPTION_VIOLATION
	/* Subscription Violation */
	25 PDSM_PD_END_FIX_METHOD_FAILURE
	/* The desired fix method failed */
	26 PDSM_PD_END_ANTENNA_SWITCH
	/* Antenna switch */
	27 PDSM_PD_END_NO_FIX_NO_TX_CONFIRM
	/* No fix reported due to no tx confirmation rcvd */
	28 PDSM_PD_END_NORMAL_ENDING
	/* Network indicated a Normal ending of the session */
	29 PDSM_PD_END_NONSPECIFIED_ERROR
	/* No error specified by the network */
	30 PDSM_PD_END_RESOURCE_SHORTAGE
	/* No resources left on the network */
	31 PDSM_PD_END_POS_SERVER_NOT_AVAILABLE
	/* Position server not available */
	32 PDSM_PD_END_UNSUPPORTED_VERSION
	/* Network reported an unsupported version of protocol*/
	33 PDSM_PD_END_SS_MOLR_ERRORS_SYSTEM_FAILURE
	/* Mapped to corresponding SS-molr-error error code */
	34 PDSM_PD_END_SS_MOLR_ERRORS_UNEXPECTED_DATA_VALUE
	/* MO-LR Error : Unexpected data value */
	35 PDSM_PD_END_SS_MOLR_ERRORS_DATA_MISSING
	/* MO-LR Error : Data missing */
	36 PDSM_PD_END_SS_MOLR_ERRORS_FACILITY_NOT_SUPPORTED
	/* MO-LR Error : Facility not supported */
	37 PDSM_PD_END_SS_MOLR_ERRORS_SS_SUBSCRIPTION_VIO

$GPSSLSR – GPS Start Location Service Request	
	LATION
	/* MO-LR Error : SS subscription violation */
	38 PDSM_PD_END_SS_MOLR_ERRORS_POSITION_METHOD_FAILURE
	/* MO-LR Error : Position method failure */
	39 PDSM_PD_END_SS_MOLR_ERRORS_UNDEFINED
	/* MO-LR Error : Undefined */
	40 PDSM_PD_END_CP_CF_DISRUPT_SMLC_TO
	/* Control plane's smlc timeout, may or may not end pd */
	41 PDSM_PD_END_MT_GUARD_TIMER_EXPIRY
	/* Control plane's MT guard time expires */
	42 PDSM_PD_END_WAIT_ADDITION_ASSIST_EXPIRY
	/* End waiting for addtional assistance */
	69 PDSM_PD_END_MO_LR_NOT_DELIVERED
	/* When MO LR COMPLETED message is recvd */
AT$GPSSLSR?	Read command returns the current settings, in the format: **$GPSSLSR: <transport_protocol>[,<pos_mode >[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,< interval> [,<service_type_id> [,<pseudonym_indicator>]]]]]]**
AT$GPSSLSR=?	$GPSSLSR: (0-2),(0-3),(64),(0,1),(64),(0,1),(0-7200),(0-255),(0,1)
Example	AT$GPSSLSR= 2,3,,,,,1 OK
Note	The current setting if stored through **$GPSSAV**

5.6.2.11. GPS Stop Location Service Request - $GPSSTOP

$GPSSTOP – GPS Stop Location Service Request	
AT$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

$GPSSTOP – GPS Stop Location Service Request	
AT$GPSSTOP?	Read command returns the current value of parameter **\<abort_cause\>**.
AT$GPSSTOP=?	OK
Example	AT$GPSSTOP=1 OK
Note	It has no effect for **\<abort_cause\>** and has no difference with **$GPSP=0** The current setting if stored through **$GPSSAV**

5.6.2.12. 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 - IMSI (default value) 3 - IPv6 (If the IPv6 is supported) **\<slp_address\>**: SLP address in FQDN format or IPv4/IPv6 format **\<slp_port_number\>** : Slp Port number integer parameter. Default value is 7275
AT$LCSSLP?	Read command returns the current SLP address.
AT$LCSSLP=?	Test command returns the range of values for parameter **\<slp_address_type\>**.
Note	If **\<slp_address_type\>** is 0 ,1 and 3, then **\<slp_address\>** is a mandatory parameter If \<**slp_address_type**\> is 2, then **\<slp_address\>** and \<**slp_port_number**\> aren't required. The current setting is stored in NVM.

5.6.2.13. Update terminal information - $LCSTER

$LCSTER - Update terminal information	
AT$LCSTER=	Set command updates the terminal information like IMSI, MSISDN or IPv4 address.

$LCSTER - Update terminal information	
<id_type> **[,<id_value>** **[,<pref_pos_mode>** **[,<tls_mode>]]]**	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	The LM940 isn't supported about **<id_type>**,**<id_value>** and **<pref_pos_mode>**. It has no effect and is included only for backward compatibility. Only <tls_mode> is valid. If **<id_type>** is MSISDN or IPv4 address, then **<id_value>** shall be entered.

5.6.2.14. MT Location Request Mode - $LCSLRMT

$LCSLRMT – MT Location Request Mode	
AT$LCSLRMT= **<mode>**	Set command is used to enable/disable unsolicited $LCSLRMT response. Parameter: **<mode>** 0 - disable unsolicited 1 - enable unsolicited (default value) The unsolicited result code is in the format: **$LCSLRMT: <transport_protocol>,<Notif_type>, <Loc_estimate_type>,<Client_Id>,<Client_NameEncoding_type>,<Client_Name_Type>,<Client_Name>,<Requestor_Id_Encoding_type>,<Requestor_Id_Type>,<Requestor_Id>,<Codeword>,<Service_Type_id>,<reqid>** Where **<transport_protocol>** 0 - C-Plane protocol 1 - SUPL Protocol

2 - Invalid

<Notif_type>

0 - Notify

1 - Verify request (no response will be treated as permission granted, see $LCSLRV)

2 - Verify request (no response will be treated as permission denied, see $LCSLRV)

<Loc_estimate_type>

0 - Current location

1 - Current or Last location known

2 - Initial location

<Requestor_Id_Encoding_type>

<Client_Name _Encoding_type>

0 - UCS2

1 - GSM default format

2 - UTF-8 format

3 - invalid format

<Client_Name_Type>

<Requestor_Id_Type>

0 - MSISDN.

1 - IMSI.
2 - IPV4.

3 - IPV6.

4 - logical name.

5 - email-address.

6 - URL

7 - SIP URL.

8 - IMS Public Identity.

9 - USSD type.

10 – invalid type

<Client_Name>

<Requestor_Id>

<Codeword>

is displayed as per data coding scheme.

<Service_Type_id>

0 - 127

<reqid>

$LCSLRMT – MT Location Request Mode	
	Integer that identifies the request. **<reqid>** uniquely identifies the MT-LR sent by the network and the same **<reqid>** shall be returned in **$LCSLRV** command in case the **<Notif_type>** is of type "Verify request"
AT$LCSLRMT?	Read command returns the current value of parameter **<mode>**.
AT$LCSLRMT=?	Test command returns the range of values for parameter **<mode>**.
Note	Because the **<reqid>** is not supported in LM940, the **<reqid>** is 0 with default. It has no effect and is included only for backward compatibility. The current setting is stored in NVM.

5.6.2.15. Location request verification - $LCSLRV

$LCSLRV – Location request verification	
AT$LCSLRV= **<permission>,** **<reqid>**	Set command is used to verify a location request coming from the network. The verification is sent back to the network with request id. Parameter: **<permission>** 0 - permission denied (default value) 1 - permission granted **<reqid>** uniquely identifies the MT-LR sent by the network
AT$LCSLRV=?	Test command returns the range of values for parameter <**permission**>.
Note	Because the **<reqid>** is not supported in LM940, It isn't used for verification. Please uses value 0 by default. It has no effect and is included only for backward compatibility.

5.6.2.16. LCS certificate - $LTC

$LTC – LCS certificate	
AT$LTC= **<string>,<total_m essage_length>, <seq_no>,<Secur ity_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

$LTC – LCS certificate	
	segment)
	<total_message_length> - The total size of the certificate to be received
	1 - 4096
	<seq_no> - The sequence number of the segment.
	1 - 13
	<Security_Object_Type>
	0 - Root Certificate
AT$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>**
Note	The last two certificates are stored in NVM

5.6.2.17. Configuration of the GNSS Receiver - $GNSSCONF

$GNSSCONF – Configuration of the GNSS Receiver	
AT$GNSSCONF= **<combination> [,<worldwide>]**	Set command configures the capabilities of the GNSS receiver. Parameter: **<combination>** : GNSS configuration 0 - GPS Only 1 - GPS + GLONASS 2 - GPS + GALILEO 3 - GPS + GLONASS + GALILEO 4 - GPS + GLONASS + BEIDOU 5 - GPS + BEIDOU + GALILEO 6 - GPS + GLONASS + BEIDOU + GALILEO (**Default**) 7 - GPS + GLONASS + QZSS 8 - GPS + GLONASS + BEIDOU + QZSS

$GNSSCONF – Configuration of the GNSS Receiver	
	<worldwide> : Applicable area The BEIDOU, GALILEO and QZSS are only applicable for this option. 0 - Outside of the United States (Default) 1 - Worldwide (For test/debug purposes)
AT$GNSSCONF?	Read command returns the currently selected GNSS configuration in the format: **$GNSSCONF: <combination>,<worldwide>** where: **<combination>** - GNSS configurastion **<worldwide>** - Applicable area
AT$GNSSCONF= ?	Test command reports the supported range of values for parameter(s) **<combination>**,**<worldwide>**. **$GNSSCONF: (the supported range of <combination>),(the supported range of <worldwide>)**
Note	New setting is applicable across device power cycles. The **<worldwide>** configuration is only meant for test/debug purposes. The current setting is stored in NVM.

5.6.2.18. GPS Lock Mode - $GPSLOCK

$GPSLOCK – GPS Lock Mode	
AT$GPSLOCK= <mode>	Set command sets the GPS Lock Mode. Parameter: **<mode>** : Lock Mode 0 - GPS Unlock (**Default**) 1 - Mobile-Initiated(MI) session is locked 2 - Mobile-Terminated(MT) session is locked 3 - Except for an emergency call, All(MI and MT) is locked
AT$GPSLOCK?	Read command returns the currently selected Lock Mode in the format:

$GPSLOCK – GPS Lock Mode	
	$GPSLOCK: <mode> where: **<mode >** - Lock Mode
AT$GPSLOCK=?	Test command reports the supported range of values for parameter(s) **<mode>**. **$GPSLOCK: (the supported range of <mode>)**
Note	During an emergency call, an MT session will always be permitted irrespective of the setting. The current setting is stored in NVM.

5.6.2.19. Configuration of GNSS Antenna Port Type - $GPSANTPORT

$GPSANTPORT – Configuration of GNSS Antenna Port Type	
AT$GPSANTPORT= **<type>**	Set command selects to configure GNSS Antenna Port Type. Parameters: **<type>** : Enabled Port type 0 – Disable GNSS on AUX Port and GNSS Port. (*GNSS Off*) 1 – Enable GNSS son AUX Port and disable GNSS on GNSS Port. (*Passive antenna on Aux Port*) 2 – Enable GNSS on GNSS Port and disable GNSS on AUX Port; DC-Bias Off. (*Passive antenna on GNSS Port*) (**Default**) 3 – Enable GNSS on GNSS Port and disable GNSS on AUX Port; DC-Bias On. (*Active antenna on GNSS Port*) 4 – Enable GNSS on GNSS Port, disable GNSS on AUX Port; High Gain Mode, DC-Bias On. (*Active antenna on GNSS Port, High Gain*)
AT$GPSANTPORT?	Read command returns the currently selected Port Type in the format: **$GPSANTPORT: <type>** where: **<type >** - Enabled Port Type
AT$GPSANTPORT=?	Test command reports the supported range of values for parameter(s) **<type>**. **$GPSANTPORT: (the supported range of <type>)**

$GPSANTPORT – Configuration of GNSS Antenna Port Type	
Note	The current setting is stored in NVM.

5.6.2.20. Position Mode Configuration - $AGPSEN

$AGPSEN – Set the Position Modes supported on the module.	
AT$AGPSEN= <mode>	Execution command set GPS/A-GPS/A-GLONASS capability supporting to module. Parameters: **<mode>** - GPS Capability 0 – Standalone GPS only(**Default** on Sprint Ver.) 1 – Full GPS Capability (Standalone GPS, A-GPS) (**Default** except for Sprint Ver.) 2 – Full GPS (Standalone GPS, A-GPS) and A-GLONASS Capability. 3 – Not support GPS
AT$AGPSEN?	Read command returns the currently selected GPS Capability in the format: **$AGPSEN: <mode>** where: **<mode >** - GPS Capability
AT$AGPSEN=?	Test command reports the supported range of values for parameter(s) **<mode>**. **$AGPSEN: (the supported range of <mode>)**
Note	The current setting is stored in NVM.

5.6.2.21. LPP Configuration - $LCSLPP

$LCSLPP – LPP Configuration	
AT$LCSLPP=<mode>	Execution command set the Configuration Information for LPP(LTE Poisioning Protocol). Parameters: **< mode >** - Configuration for LPP. 0 – RRLP in LTE 1 – LPP User Plane in LTE

$LCSLPP – LPP Configuration	
	2 – LPP Control Plane in LTE (**Default**) 3 – LPP UP/CP in LTE
AT$LCSLPP?	Read command returns the currently selected Configuration for LPP in the format: **$LCSLPP: <mode>** where: **<mode >** - Configuration for LPP
AT$LCSLPP=?	Test command reports the supported range of values for parameter(s) **<mode>**. **$LCSLPP: (the supported range of <mode>)**
Note	The current setting is stored in NVM.

5.6.2.22. Selection of Positioning Protocol for A-GLONASS - $LCSAGLO

$LCSAGLO – Selection of Positioning protocols for A-GLONASS	
AT$LCSAGLO= <mask>	Execution command set selection of positioning protocols for A-GLONASS. Parameters: **<mask>** - Protocol mask of A-GLONASS 0 – Not selected (**Default**) 1 – RRC Control Plane (In case **AT&T**, Default) 2 – RRLP User Plane 4 – LPP User Plane 8 – LPP Control Plane
AT$LCSAGLO?	Read command returns the currently selected Protocol mask of A-GLONASS in the format: **$LCSAGLO: <mask>** where:

$LCSAGLO – Selection of Positioning protocols for A-GLONASS	
	\<mask\> - Protocol mask of A-GLONASS
AT$LCSAGLO=?	Test command reports the supported range of values for parameter(s) **\<mask\>**. **$LCSAGLO: (the supported range of \<mask\>)**
Note	This command is only applicable for A-GLONASS capable setting. (see **$AGPSEN**) The **\<mask\> 4 and 8** must be set in the LPP configuration for this to take effect. (see **$LCSLPP**) The current setting is stored in NVM.

5.6.2.23. GPS Location Request Mode - $LOCMODE

$LOCMODE – GPS Location Request Mode	

AT$LOCMODE=\<mode\>	This command executes the Location request for autonomous GPS.
	
	Executes Position Location request depending on parameter **\<mode\>**
	Parameter:
	
	\<mode\> : location request mode
	Integer
	  0 – Terminate autonomous GPS session
	  1 – Activate autonomous GPS session

AT$LOCMODE=?	Test command returns the current value of the location mode **\<mode\>**. **$LOCMODE: \<mode\>** where: **\<mode \>** - location request mode
Note	This command is only applicable for Sprint version.

5.6.2.24. Enable NMEA Stream - $NMEA

$NMEA – Enable NMEA Stream	
AT$NMEA=\<n\>	This command enables/disables the NMEA 0183 standard stream inside the module.

$NMEA – Enable NMEA Stream	
	Sets the ability to enable or disable the NMEA stream.
	Allows NEMA 0183 Sentences :
	$GPGGA,$GPGSA,$GPGSV,$GPRMC and $GPVTG
	Parameter:
	<n> : Integer
	0 – Disable the NMEA 0183 standard stream.
	1 – Enable the NMEA 0183 standard stream.
	Note: The $GPSNMUN setting is also influenced by $NMEA setting.
AT$NMEA=?	Reports the current value of the **<n>** parameter, in the format:
	$NMEA: **<n>**
Note	This command is only applicable for Sprint version.
	This setting have an effect on **$GPSNMUN** setting and follows the storing opeartion of **$GPSNMUN** setting.
Example	AT$NMEA=? $NMEA: 0 OK AT$GPSNMUN? $GPSNMUN: 0,0,0,0,0,0,0 OK AT$NMEA=1 OK AT$GPSNMUN? $GPSNMUN: 2,1,0,1,1,1,1 OK AT&W OK AT&P OK //After module is reboot, AT$GPSNMUN? $GPSNMUN: 2,1,0,1,1,1,1

$NMEA – Enable NMEA Stream	
	OK
	AT$NMEA=?
	$NMEA: 1
	OK

5.6.2.25. Enable Location Services - $LOCATION

$LOCATION – Enable Location Services	
AT$LOCATION= **<n>**	This command enables/disables the Location Services inside the module. Sets the ability to enable or disable the Location Services Parameter: **<n>** : Integer 0 – Disable Location Services 1 – Enable Location Services (**Default**)
AT$LOCATION=?	Reports the current value of the <n> parameter, in the format: $LOCATION: **<n>**
Note	This command is only applicable for Sprint version.
Example	AT$LOCATION=? $LOCATION: 0 OK AT$LOCATION =1 OK

5.6.2.26. Get Current Location - $GETLOCATION

$GETLOCATION – Get Current Location	
AT$GETLOCATION	Execution command returns information about the last current location in the format: **<date>,<time>,<latitude>,<longitude>,<elevation>,** **<HEPE>,<speed>,<bearing>,<nsat>**

$GETLOCATION – Get Current Location	
	where:
	<**date**> - date (MM/DD/YYYY) stamp
	<**time**> - 24 hour time (HH:MM:SS) stamp
	<**latitude**> - latitude in decimal degrees (±DD.dddddd)
	+/- : North / South
	max of 90.000000 degrees
	<**longitude**> - longitude in decimal degrees (±DDD.dddddd)
	+/- : East / West
	max of 180.000000 degrees
	<**elevation**> - elevation in meters (±nnnn)
	Above[+] or below[-] sea level with reference to the WGS 84 reference Ellipsoid
	<**HEPE**> - Horizontal Estimated Position Error in meters (nnnnnn)
	<**speed**> - speed in meters per second (nnn)
	<**bearing**> - bearing in decimal degrees (+DDD.dd)
	<**nsat**> - number of satellites used in location fix (nn)
	Note: If the location position is not to be retrieved or the location services are turned off, **ERROR** will be return.
Note	This command is only applicable for Sprint version.
Example	AT$GETLOCATION
	09/24/2009,21:43:57,39.012345,-104.012345,+312,1234567,40,359.93,13
	OK

5.6.3. SMS AT Commands

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

#SMSFORMAT – Select 3GPP or 3GPP2 Format for MO SMS	
AT#SMSFORMAT = [<mode>]	Set command selects the 3GPP or 3GPP2 format for MO SMS.
	Parameter:
	<**mode**> - MO SMS format
	0 – 3GPP format (factory default)
	1 – 3GPP2 format (factory default for Verizon)

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

5.6.3.2. Domain Configuration for Outgoing SMS - #ISMSCFG

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

5.6.4.   SIM Toolkit AT Commands

5.6.4.1. 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.

#STIA - SIM Toolkit Interface Activation	
	Parameters: **<mode>** 0 - disable SAT 1 - enable SAT without unsolicited indication **#STN** (default) 2 - enable SAT and extended unsolicited indication **#STN** (see **#STGI**) 3 - enable SAT and reduced unsolicited indication **#STN** (see **#STGI**) 17 - enable SAT without unsolicited indication #STN and 3GPP TS 23.038 alphabet used 18 - enable SAT and extended unsolicited indication #STN (see #STGI) and 3GPP TS 23.038 alphabet used 19 - enable SAT and reduced unsolicited indication #STN (see #STGI)and 3GPP TS 23.038 alphabet used 33 - enable SAT without unsolicited indication #STN and UCS2 alphabet used 34 - enable SAT and extended unsolicited indication #STN (see #STGI)and UCS2 alphabet used 35 - enable SAT and reduced unsolicited indication #STN (see #STGI)and UCS2 alphabet used **<timeout>** - time-out for user responses 1.. 2 - time-out in minutes (default 2). Any ongoing (but unanswered) **proactive command** will be aborted automatically after **<timeout>** minutes. In this 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:

#STIA - SIM Toolkit Interface Activation	
	• 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 <table><tr><td>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.</td></tr></table> *if **<cmdType>=17** (SEND SS)* *if **<cmdType>=19** (SEND SHORT MESSAGE)* *if **<cmdType>=20** (SEND DTMF)* *if **<cmdType>=32** (PLAY TONE)*

#STIA - SIM Toolkit Interface Activation	

	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

#STIA - SIM Toolkit Interface Activation	
	<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:

#STIA - SIM Toolkit Interface Activation	
	• **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. *if **<cmdType>=64** (OPEN CHANNEL)* an unsolicited notification will be sent to the user:

#STIA - SIM Toolkit Interface Activation	
	#STN: <cmdType>[,<text>]
	where:
	<text> - optional text string sent by SIM
	In this case: **AT#STSR=64,34** can be sent to reject request. **AT#STGI** is accepted anyway. **AT#STSR=<cmdType>,0** will start connection.
	All other commands:
	the unsolicited indication will report just the proactive command type:
	#STN: <cmdType>
	Note: if the **call control** or **SMS control facility in the SIM** is activated, when the customer application makes an outgoing call, or sends an SS or USSD, or an SMS, the following **#STN** unsolicited indication could be sent, according to GSM 11.14, to indicate whether the outgoing call has been accepted, rejected or modified by the SIM, or if the SMS service centre address or destination has been changed:
	#STN: <cmdTerminateValue>,<Result>[,<TextInfo>[,<Number> [,<MODestAddr>]]]
	where
	<cmdTerminateValue>
	150 - SMS control response
	160 - call/SS/USSD response
	<Result>
	0 - Call/SMS not allowed
	1 - Call/SMS allowed
	2 - Call/SMS allowed with modification

#STIA - SIM Toolkit Interface Activation	
	<Number> - Called number, Service Center Address or SS String in ASCII format.
	<MODestAddr> - MO destination address in ASCII format.
	<TextInfo> - alpha identifier provided by the SIM in ASCII format.
	Note: an unsolicited result code
	#STN: 254
	is sent if the user has indicated the need to end the proactive SIM application session (**AT#STSR=<cmdType>,**16 i.e. "proactive SIM application session terminated by the user" according to GSM 11.14).
	The TA does not need to respond directly, i.e. **AT#STSR** is not required.
	It is possible to restart the SAT session from the main menu again with the command **AT#STGI=37**.
	Note: The settings are saved on user profile and available on following reboot. SIM Toolkit activation/deactivation is only performed at power on.
AT#STIA?	Read command can be used to get information about the SAT interface in the format:
	#STIA: <state>,<mode>,<timeout>,<SatProfile>
	where:
	<state> - the device is in one of the following state:
	0 - SIM has not started its application yet
	1 - SIM has started its application (SAT main menu ready)
	<mode> - SAT and unsolicited indications enabling status (see above)
	<timeout> - time-out for user responses (see above)
	<SatProfile> - SAT Terminal Profile according to GSM 11.14, i. e. the list of SIM Application Toolkit facilities that are

#STIA - SIM Toolkit Interface Activation	
	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**).

5.6.4.2. SIM Toolkit Get Information - #STGI

#STGI - SIM Toolkit Get Information	
AT#STGI= **[<cmdType>]**	**#STGI** set command is used to request the parameters of a **proactive command** from the ME. Parameter: **<cmdType>** - **proactive command** ID according to GSM 11.14 (decimal); these are only those command types that use the AT interface; SAT commands which are not using the AT interface (not MMI related SAT commands, e.g. PROVIDE LOCAL INFORMATION) are executed without sending any indication to the user 1 - REFRESH 5 – SET UP EVENT LIST 16 - SET UP CALL 17 - SEND SS

	18 - SEND USSD
	19 - SEND SHORT MESSAGE
	20 - SEND DTMF
	32 - PLAY TONE
	33 - DISPLAY TEXT
	34 - GET INKEY
	35 - GET INPUT
	36 - SELECT ITEM
	37 - SET UP MENU
	40 – SET UP IDLE MODE TEXT
	64 – OPEN CHANNEL
	Requested command parameters are sent using an **#STGI** indication:
	#STGI: <parameters>
	where **<parameters>** depends upon the ongoing **proactive command** as follows:
	if **<cmdType>=1** *(REFRESH)*
	#STGI: <cmdType>,<refresh type>
	where:
	<refresh type>
	0 - SIM Initialization and Full File Change Notification;
	1 - File Change Notification;
	2 - SIM Initialization and File Change Notification;
	3 - SIM Initialization;
	4 - SIM Reset
	if **<cmdType>=5** *(SET UP EVENT LIST)*
	#STGI: <cmdType>,<event list mask>
	where:
	<event list mask> - hexadecimal number representing the list of events to monitor (see GSM 11.14):

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

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

where:

<text> - text to be displayed to user

<div align="center">

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

</div>

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

where:

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

<div align="center">

*if **<cmdType>=34** (GET INKEY)*

</div>

#STGI: <cmdType>,<commandDetails>,<text>

where:

<commandDetails> - unsigned Integer used as a bit field.
  0..255 - used as a bit field:
   bit 1:
     0 - Digits only (0-9, *, # and +)
     1 - Alphabet set;
   bit 2:
     0 - SMS default alphabet (GSM character set)
     1 - UCS2 alphabet
   bit 3:

0 - Character sets defined by bit 1 and bit 2 are enabled

1 - Character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested

bits 4 to 7:

 0

bit 8:

 0 - No help information available

 1 - Help information available

<text> - String as prompt for text.

*if **<cmdType>=35** (GET INPUT)*

#STGI: <cmdType>,<commandDetails>,<text>,<responseMin>, <responseMax>[,<defaultText>]

where:

<commandDetails> - unsigned Integer used as a bit field.

 0..255 - used as a bit field:

    bit 1:

     0 - Digits only (0-9, *, #, and +)

     1 - Alphabet set

    bit 2:

     0 - SMS default alphabet (GSM character set)

     1 - UCS2 alphabet

    bit 3:

     0 - ME may echo user input on the display

     1 - User input shall not be revealed in any way. Hidden entry mode (see GSM 11.14) is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.

    bit 4:

     0 - User input to be in unpacked format

     1 - User input to be in SMS packed format

    bits 5 to 7:

     0

    bit 8:

     0 - No help information available

1 - Help information available

<text> - string as prompt for text

<responseMin> - minimum length of user input

  0..255

<responseMax> - maximum length of user input

  0..255

<defaultText> - string supplied as default response text

*if **<cmdType>=36** (SELECT ITEM)*

The first line of output is:

**#STGI:
<cmdType>,<commandDetails>,<numOfItems>[,<titleText>]
<CR><LF>**

One line follows for every item, repeated for **<numOfItems>**:

#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]

where:

<commandDetails> - unsigned Integer used as a bitfield

  0..255 - used as a bit field:

    bit 1:

     0 - Presentation type is not specified

     1 - Presentation type is specified in bit 2

    bit 2:

     0 - Presentation as a choice of data values if bit 1 = '1'

     1 - Presentation as a choice of navigation options if bit 1 is '1'

    bit 3:

     0 - No selection preference

     1 - Selection using soft key preferred

    bits 4 to 7:

     0

    bit 8:

     0 - No help information available

1 - Help information available

<numOfItems> - number of items in the list

<titleText> - string giving menu title

<itemId> - item identifier

1..**<numOfItems>**

<itemText> - title of item

<nextActionId> - the next proactive command type to be issued upon execution of the menu item.

0 - no next action information available.

if **<cmdType>=37** *(SET UP MENU)*

The first line of output is:

#STGI: <cmdType>,<commandDetails>,<numOfItems>,<titleText> <CR><LF>

One line follows for every item, repeated for **<numOfItems>**:

#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]

where:

<commandDetails> - unsigned Integer used as a bitfield

0..255 - used as a bit field:

bit 1:

0 - no selection preference

1 - selection using soft key preferred

bit 2 to 7:

0

bit 8:

0 - no help information available

1 - help information available

<numOfItems> - number of items in the list

<titleText> - string giving menu title

<itemId> - item identifier

1..**<numOfItems>**

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

	is an indication that the main menu of the SIM Application has been removed from the TA, and it is no longer available. In this case **AT#STGI=37** command response will be always **ERROR**.

5.6.4.3. SIM Toolkit Send Response - #STSR

#STSR - SIM Toolkit Send Response	
AT#STSR= [<cmdType>, <userResponse> [,<data>]]	The write command is used to provide to SIM user response to a command and any required user information, e.g. a selected menu item.
	Parameters:
	<cmdType> - integer type; **proactive command** ID according to 3GPP TS 31.114 (see **#STGI**)
	<userResponse> - action performed by the user
	0 - command performed successfully (call accepted in case of call setup)
	16 - proactive SIM session terminated by user
	17 - backward move in the proactive SIM session requested by the user
	18 - no response from user
	19 - help information required by the user
	20 - USSD/SS Transaction terminated by user
	32 - TA currently unable to process command
	34 - user has denied SIM call setup request
	35 - user cleared down SIM call before connection or network release
	<data> - data entered by user, depending on **<cmdType>**, only required if **<Result>** is 0:
	Get Inkey
	<data> contains the key pressed by the user; used character set should be the one selected with **+CSCS**
	Note: if, as a user response, a binary choice (Yes/No) is requested by the SIM application using bit 3 of the **<commandDetails>** parameter the valid content of the **<inputString>** is:
	a) "IRA", "8859-1", "PCCP437" charsets: "Y" or "y" (positive answer) and "N" or "n" (negative answer)
	b) UCS2 alphabet "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer)

#STSR - SIM Toolkit Send Response	
	Get Input
	<data> - contains the string of characters entered by the user (see above)
	Select Item
	<data> - contains the item identifier selected by the user
	Note:
	Use of icons is not supported. All icon related actions will respond with no icon available.
AT#STSR?	The read command can be used to request the currently ongoing **proactive command** and the SAT state in the format
	#STSR: <state>,<cmdType>
	where:
	<state> - SAT interface state (see **#STIA)**
	<cmdType> - ongoing proactive command
	An error message will be returned if there is no pending command.
AT#STSR=?	Test command returns the range for the parameters **<state>** and **<cmdType>**.

5.6.5.   Device Management (OMA-DM) Commands

5.6.5.1. AT&T OMA-DM Configuration management - #ATTOMADMCFG

#ATTOMADMCFG – AT&T OMA-DM Configuration	
AT#ATTOMADMC FG=<unsolicited> [,<account type>]	This command sets the configuration for the AT&T OMA-DM service.
	Parameters:
	<unsolicited> - type of notification:
	0 – disabled
	1 – enabled (factory default); the ME informs about reception of DM events related to ongoing session through an unsolicited code.
	#OMADM: <event>

#ATTOMADMCFG – AT&T OMA-DM Configuration	
	Where **<event>** is one of the strings
	"ATT_BOOTSTRAP_GET_PIN" – Request PIN code
	"ATT_BOOTSTRAP_GET_NSS" – Request NSS data
	<account type> - is used to select change the server to connect to (if necessary).
	0 - AT&T Production (factory default)
	1 - AT&T Laboratory
	2 - (reserved)
	3 - (reserved)
	4 - AT&T IOT
	Note: the value set by command is directly stored in NVM.
AT#ATTOMADMC FG?	Read command reports the currently selected parameters: **#ATTOMADMCFG: <unsolicited>,<account type>**
AT#ATTOMADMC FG=?	Test command reports the supported range of values for parameters **<unsolicited>** and **<account type>**

5.6.5.2. Host ODIS parameters management - #HOSTODIS

#HOSTODIS – Host ODIS parameters management	
AT#HOSTODIS=< Param>,<Action> [,<Value>]	The set command is intended to allow the end-user to handle the Host Odis parameters for AT&T OMADM client.
	Parameters:
	<Param> - this parameter should be used to select the parameter to work on:
	0 is for the Host Manufacturer;
	1 is for the Host Model;
	2 is for the Host Software application version.
	3 is for the Host ID.
	<Action> - this parameter should be used to select the action to be performed on the chosen parameter:
	0 is to perform a "set";

#HOSTODIS – Host ODIS parameters management	
	1 is to perform a "get" 2 is to perform a "reset"; **\<Value\>** - only valid in case of \<Action\> set to 0, it should contain a string with the proper value. Note: the value set by command is directly stored in NVM.
AT#HOSTODIS =?	Test command reports the supported range of values for parameters **\<unsolicited\>** and **\<account type\>** and **\<Value\>**

Example	//get the currently set values (i.e.: host Model)
	AT#HOSTODIS=1,1
	#HOSTODIS:"HMOD1"
	
	OK
	
	//set a new Host Model value
	AT#HOSTODIS=1,0,"HMOD2"
	 OK
	
	//read the currently set value
	AT#HOSTODIS=1,1
	
	#HOSTODIS: "HMOD2"
	OK
	
	//reset the Model value
	AT#HOSTODIS=1,2
	
	OK
	
	//read again the currently set value
	AT#HOSTODIS=1,1
	#HOSTODIS:""

#HOSTODIS – Host ODIS parameters management	
	OK //test command AT#HOSTODIS=? #HOSTODIS: (0-3),(0-2),64 OK

5.6.5.3. OMA-DM Send PIN or NSS - #OMASENDPIN

#OMASENDPIN – OMA-DM Send PIN or NSS	
AT#OMASENDPIN =<data>	This command sends a response to an ATT_BOOTSTRAP_GET_PIN or ATT_BOOTSTRAP_GET_NSS event (see #ATTOMADMCFG command). Parameters: **<data>** - string corresponding to the requested PIN or NSS data
AT#OMASENDPIN=?	Test command tests for command existence
Example	*// When request a PIN or NSS data in the ATT Server's OTA Bootstrap, the LM940 module will represents the following message:* #OMADM: "ATT_BOOTSTRAP_GET_PIN" or #OMADM: "ATT_BOOTSTRAP_GET_NSS" *// In this case, the LM940 module can pass the requested data from ATT Server through the #OMASENDPIN command* AT#OMASENDPIN=1234 OK

5.6.6.1. DISCONNECT/CONNECT - #ICMCONNECT

#ICMCONNECT – Establish RNDIS data call for multiple PDNs	

AT#ICMCONNECT=
 	
<Cid>,<Connection>[,<userIpType>]
	This command establishes data call, referring to the PDP profile specified by the Cid and makes it possible that ECM/RNDIS could bind the activated data service and have an access to external internet.
	
	Parameters:
	<Cid> : PDP profile identifier
	   1-5
	
	<Connection>
	   0 - disconnect
	   1 - connect
	
	<userIpType>
	   1 - ipv4 (default)
	   2 - ipv6
	
	Note: It should be set to ECM or RNDIS in advance which interface is configured with the #USBCFG=0 or the #USBCFG=3 respectively.
	
	Note: This command activates a specified PDP context, so all necessary operations have to be done before issuing the command like registering to network and configuring PDP profiles.
	
	Note: The "OK" result code does not guarantee that ECM/RNDIS is connected successfully. It is recommended that User should verify the status of connection by issuing read command.
	
	Note: Error is returned if profile is not valid. Refer to +CDGCONT to set profile.
	
	Note: Only 1 APN can be brought up when VLAN tagged mode is disabled or the associated Cid is not defined in the VLAN list.
	
	Note: If Cid is defined in the VLAN list and VLAN tagged mode is enabled, VLAN interface could be brought up by using this AT

#ICMCONNECT – Establish RNDIS data call for multiple PDNs	
	command. It is possible to bring up multiple network interfaces simultaneously which consist of both ECM/RNDIS primary interface and VLAN interfaces over the ECM/RNDIS. The multiple interfaces come to have dedicated data paths to each APN defined by the corresponding Cid.

AT#ICMCONNECT?	Read command returns the session state in the following format:
	
	#ICMCONNECT: <Cid>,<ipv4State>,<ipv6State>
	#ICMCONNECT: <Cid>,<ipv4State>,<ipv6State>
	OK
	where **<ipv4State>** and **<ipv6State>** can be:
	  0 - disconnected
	  1 - connected
	
	Ex)
	AT#ICMCONNECT?
	#ICMCONNECT: 1,0,1
	
	OK
	
	Note: The default response in untagged mode is
	 #ICMCONNECT: 1,0,0
	
	 OK
	Note : The default response in VLAN tagged mode is
	 #ICMCONNECT: 1,0,0
	 #ICMCONNECT: 2,0,0
	
	 OK

AT#ICMCONNECT=?	Test command returns the range of supported values for all the parameters. AT#ICMCONNECT=? #ICMCONNECT: (1-5),(0,1),(1,2) OK

#ICMLANCFG – Configure LAN Setting	

AT#ICMLANCFG=
 	
<GWIPAddress>,<Su bNetMask>[,<DHCP> ,<Start_IPaddress>,< End_IPaddress>[,<le ase_time>]]
	This command configures LAN parameters for gateway, subnet mask and DHCP. One network interface(Primary interface in tagged mode) is only supported and DHCP is always enabled.
	
	TE(Host) is assigned both local and gateway IP addresses by DHCP server which is subject to this command even if there is no activated PDP context.
	
	Parameters:
	<GWIPAddress>: Gateway IP address inside AP subsystem.
	  192.168.225.1 (default)
	  - any valid IP address in the format: "xxx.xxx.xxx.xxx"
	
	<SubNetMask>: Subnet mask for gateway to route intranet and internet.
	  255.255.255.0 (default)
	  - any valid IP address in the format: "xxx.xxx.xxx.xxx"
	
	<DHCP state>: DHCP server to assign IP address for ECM/RNDIS client
	  1 - enable (default)
	
	<Start_IPaddress>: Starting of IP range to be assigned by DHCP server to ECM/RNDIS client
	  192.168.225.11 (default)
	  - any valid IP address in the format: "xxx.xxx.xxx.xxx"
	
	<End_IPaddress>: Last of IP range to be assigned by DHCP server to ECM/RNDIS client
	  192.168.225.20 (default)
	  - any valid IP address in the format: "xxx.xxx.xxx.xxx"
	
	<lease_time>: Lease time for maintaining IP address assigned by DHCP. Device will be reassigned as expired lease time(seconds).
	  2592000 (default)
	  120 – 2592000

#ICMLANCFG – Configure LAN Setting	
	Note:Start_IPaddress and End_IPaddress should be configured within the same subnet as GWIPaddress. Otherwise, module repsonds with Error. If GWIPaddres is x.x.x.1, then Start_IPaddress is x.x.x.11 and End_IPaddress is x.x.x.20. Note: Both local and GW address for secondary interface (USB VLAN) is automatically configured to decrement as much as '1', referring to primary interface's gateway address. That is, the local and GW addresses becomes 192.168.224.x and 192.168.224.1 respectively if the primary is configured 192.168.225.x and 192.168.225.1 and cid is 2.
AT#ICMLANCFG?	Read command returns the values in the following format: **#ICMLANCFG: \<GWIPAddress>,\<SubNetMask>,\<DHCP>,\<Start_IPaddress> ,\<End_IPaddress>,\<lease_time>** **OK** Ex) AT#ICMLANCFG? #ICMLANCFG: 192.168.225.1,255.255.255.0,1,192.168.225.11,192.168.225.20, 2592000 OK
AT#ICMLANCFG=?	Test command returns the range of supported values for all the parameters. AT#ICMLANCFG=? #ICMLANCFG: ,,(1),,,(120-2592000) OK

5.6.6.3. Set CID, VLAN ID - #VLANLIST

#VLANLIST – To add or remove a pair of CID and VLAN ID	
AT#VLANLIST=\<Cmd >,\<Cid>,\<VLAN_ID>	Set command to configure or delete a pair of CID and VLAN ID in its own internal list. Data connection associated with the Cid is dedicated to a VLAN interface. Parameters:

#VLANLIST – To add or remove a pair of CID and VLAN ID	
	\<Cmd\>: set or delete command 1 - add 2 - remove **\<Cid\>:** PDP Profile ID. The paired VLAN is routed to the network interface indicated by the ID when the corresponding PDP is activated and VLAN tagged mode is enabled 1 – 5 **\<VLAN_ID\>:** Identifier for added virtual LAN over ECM/RNDIS interface. 1 - 4094 Note: Cid indicates Profile ID that is created by +CGDCONT. Refer to +CGDCONT. If the Profile is not valid, it could not create the VLAN list. Note: It is required to add VLAN list prior to VLANTAGGED command executed and then VLAN tag mode enabled. The configuration become effective after rebooting Note: This command could work even though USB is disconnected
AT#VLANLIST?	Read command show the current option values in the following format: #VLANLIST: **\<Cid\>,\<VLAN_ID\>** ex) AT#VLANLIST? #VLANLIST: 2,2000 #VLANLIST: 3,3000 OK
AT#VLANLIST=?	Test command returns the list of the supported values. AT#VLANLIST=? #VLANLIST: (1,2),(1-5),(1-4094)

#VLANLIST – To add or remove a pair of CID and VLAN ID	
	OK

5.6.6.4. Set VLAN mode over ECM/RNDIS - #VLANTAGGED

#VLANTAGGED – To set or read VLAN mode	
AT#VLANTAGGED= mode>	Set command to configure VLAN mode over RNDIS/ECM Parameters: **<mode>:** 0 : disable (default) 1 : enable Note: It is required to configure the VLAN list by #VLANLIST command before enabling the VLAN tag mode with this command. Otherwise, the module could not create VLAN interface over ECM/RNDIS Note: It is needed to power recycle the module to make VLAN tag mode effective after issuing the command Note: Under untagged mode, ECM/RNDIS only supports 1 network interface and 1 APN. Note: This command could work even though USB is disconnected
AT#VLANTAGGED?	Read command shows the current configuration in the following format: **#VLANTAGGED: <mode>** ex) AT#VLANTAGGED? #VLANTAGGED: 0 OK
AT#VLANTAGGED =?	Test command returns the list of the supported values. AT#VLANTAGGED=? #VLANTAGGED: (0,1)

#VLANTAGGED – To set or read VLAN mode	
	OK

5.6.6.5. Enable roaming data call - #ICMROAMINGEN

#ICMROAMINGEN – Restrict or allow data call in roaming area	
AT#ICMROAMINGEN=<mode>	Resrict or allow data call in roaming area Parameters: **<mode>:** 0 : not allowed (default) 1 : allowed Note: It is needed to power recycle the module to make VLAN tag mode effective after issuing the command
AT#ICMROAMINGEN?	Read command shows the current configuration in the following format: **#ICMROAMINGEN: <mode>** ex) AT#ICMROAMINGEN? #ICMROAMINGEN: 0 OK
AT#ICMROAMINGEN =?	Test command returns the list of the supported values. AT#ICMROAMINGEN=? #ICMROAMINGEN: (0,1) OK

6. AT PARSER ABORT

The following AT Command list can be aborted, while executing the AT Command

ATD

ATA

+CMGS

+CMSS

+COPN

+COPS

+CPOL

NOTE: If DTE transmit any character before receiving the response to the issued AT Command, this make current AT Command to be aborted.

7. APPENDIX

7.1. CA List Supported Per Variant

GENERIC	1A+3A, 1A+5A, 1A+7A, 1A+8A, 1A+20A, 1A+28A, 3A+3A, 3A+5A, 3A+7A, 3A+8A, 3A+20A, 3A+28A, 5A+7A, 5A+40A, 7A+7A, 7A+8A, 7A+20A, 7A+28A, 28A+40A, 40A+40A, 3C, 5B, 7B, 7C, 38C, 40C, 1A+3A+5A, 1A+3A+8A, 1A+3A+20A, 1A+3A+28A, 1A+5A+7A, 1A+7A+20A, 1A+7A+28A, 3A+3A+8A, 3A+7A+8A, 3A+7A+20A, 3A+7A+28A, 1A+3C, 3A+7B, 3A+7C, 3C+5A, 3C+7A, 3C+20A, 5A+40C, 7B+28A, 7C+28A, 28A+40C, 40D
ATT	2A+4A, 2A+5A, 2A+12A,2A+29A, 2A+30A, 2A+66A, 4A+5A, 4A+12A, 4A+29A, 4A+30A, 5A+30A, 5A+66A, 12A+30A, 12A+66A, 30A+29A, 30A+66A, 66A+29A, 2A+2A, 4A+4A, 66A+66A, 2C, 5B, 12B, 66B, 66C, 2A+2A+5A, 2A+2A+12A, 2A+4A+5A, 2A+4A+12A, 2A+5A+30A, 2A+5A+66A, 2A+12A+30A, 2A+12A+66A, 2A+29A+30A, 4A+4A+5A, 4A+4A+12A, 4A+5A+30A, 4A+12B, 4A+12A+30A, 4A+29A+30A, 5A+30A+66A, 5A+66A+66A, 5A+66C, 12A+30A+66A, 12A+66A+66A
VZW	2A+4A, 2A+5A, 2A+13A, 2A+66A,4A+5A, 4A+13A, 5A+66A, 13A+66A, 2A+2A, 4A+4A, 66A+66A, 5B, 66B, 66C, 2A+2A+5A, 2A+2A+13A, 2A+4A+5A, 2A+4A+13A, 2A+5A+66A, 2A+13A+66A, 4A+4A+5A, 4A+4A+13A, 5A+66A+66A, 13A+66A+66A, 66A+66C, 2A+66C, 5A+66C, 13A+66C
EU	1A+3A, 1A+7A, 1A+8A, 1A+20A, 1A+28A, 3A+3A, 3A+7A, 3A+8A, 3A+20A, 3A+28A, 7A+7A, 7A+8A, 7A+20A, 7A+28A, 28A+40A, 40A+40A, 3C, 7B, 7C, 38C, 40C, 1A+3A+8A, 1A+3A+20A, 1A+3A+28A, 1A+7A+20A, 1A+7A+28A, 1A+3C, 3A+7B, 3A+7C, 3C+7A, 3A+7A+8A, 3A+7A+20A, 3A+7A+28A, 3A+3A+8A, 3C+20A, 7B+28A, 7C+28A, 28A+40C, 40D
AU	1A+3A, 1A+5A, 1A+7A, 1A+8A, 1A+28A, 3A+5A, 3A+7A, 3A+8A, 3A+28A, 5A+7A, 5A+40A, 7A+8A, 28A+40A, 3A+3A, 7A+7A, 3C, 5B, 7B, 7C, 40C, 1A+3A+5A, 1A+3A+8A, 1A+3A+28A, 1A+5A+7A, 1A+7A+28A, 1A+3C, 3C+5A, 3C+7A, 3A+3A+8A, 3A+7B, 3A+7C, 3A+7A+8A, 3A+7A+28A, 5A+40C, 7B+28A, 7C+28A, 28A+40C, 40D
SPRINT	25A+25A, 25A+26A, 26A+41A, 41A+41A, 41C, 26A+41C, 41A+41C, 41D

8. 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

9. DOCUMENT HISTORY

Revision	Date	Changes
0	2017-04-07	Initial release
1	2017-10-20	New: +CCHC, +CCHO, +CGLA, +CUAD, #MONI, #CACTL, #HSEN, #LANG, #LCFC, #NITZ, #RFSTS, #SERVINFO, #SIMINCFG, #STGI, #STIA, #STSR, #TEMPSENS, #USB3TUNE
		Updated: #BND, #ENS, #GPIO, #HSEN, #LCFC, #LRXDIV, #NVIM, #QSS, #RFSTS, #SIMDET, #SIMINCFG, #SIMPR, #TESTMODE, #USBCFG, #VCDISABLE, &D, +CCLK, +CFUN, +CLCK, +CMGS, +CMGW, +COPN, +COPS, +CPAS, +CPOL, +CSCA, +CSIM, +CTZR, +CTZU, +CUAD, +ICCID, +CMGL(3GPP2), +CMGR(3GPP2), +CNMI(3GPP2), +CSMP(3GPP2)
		Deleted: #Z, #WAKE
2	2018-04-16	New: #USBSWITCH, $AGPSEN, $LCSLPP, $LCSAGLO, $LOCMODE, #ACTIVEFW, #CLEARFW, #GETFW, #CAINFO, #LAPS
		For sprint : $NEMA, $LOCATION, $GETLOCATION
		Updated: #BND(for sprint), #USBSWITCH, #LCFC,#CACTL, #CAINFO, $LCSAGLO,#RXTOGGLE, #RXDIV, +WS46, #USBCFG, +CGTFTRDP
3	2018-06-28	New: #ATTOMADMCFG, #HOSTODIS, #OMASENDPIN, #VZWDMACCURL, #ICMP, #FIRMWARE
		Update: $LOCMODE(for Sprint), #CAINFO, +COPS, +CEMODE, #LAPS, #TESTMODE, #BND, #ACTIVEFW, #GETFW, +CGEQREQ, +CGEQMIN, +CGEQNEG
		Update: Appendix 7.1. CA List Supported Per Variant
4	2018-11-27	New: #ICMCONNECT, #ICMLANCFG, #VLANLIST, #VLANTAGGED, #ICMROAMINGEN
		Update: #LCFC, +CLCK, #VCDISABLE, #HOSTODIS, +CMGD, #TEMPSENS
		Deleted: #VZWDMACCURL

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Link to **www.telit.com** and contact our technical support team for any questions related to technical issues.

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