LM960 Series
AT Command Reference

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APPLICABILITY TABLE

PRODUCTS

- LM960
- LM960A18
- LM960A9-P

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
- TS-APAC@telit.com

Alternatively, use:

http://www.telit.com/support

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

http://www.telit.com

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

Telit appreciates feedback from the users of our information.

1.4. Text Conventions

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

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

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

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

1.5. Related Documents

- [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.*

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

3.2. AT Command Syntax

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

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

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

Moreover:

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

3.2.1. String Type Parameters

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

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

3.2.2. Command Lines

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

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

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

The basic structures of the command line are:

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

[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
31	network time-out
32	network not allowed - emergency calls only

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

Numeric Format	Verbose Format
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
332	network time-out
340	no +CNMA acknowledgement expected

Numeric Format	Meaning
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	#STIA	#SIMPR
+CGEREP	+CTZU	+CTZR
+CSTF	+CSDF	+CSVM
+CPNER	#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	#SIMINCFG
#HSEN	#CACTL	$LCSLPP
$AGPSEN	$CACTL	#RXTOGGLE
#ICMP	#LTECAT	#WWANLED
#DGCFG	#LOCAUTOSTART	#LOCNMEATYPE
#DGENABLE	#4RXDIS	+CPMS
#SIMDET		

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

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

+CSCA	+CSMP	+CSCB

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

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

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

[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
LM960/LM960A18		•	•
LM960A9-P			•

4.2. AT Commands Availability Table

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
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

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
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/Fall forward
+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

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
+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

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
+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	•	•	•	•	•	•	Printing 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

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
+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
#CBC	•	•	•	•	•	•	Battery and Charger Status
#QSS	•	•	•	•	•	•	Query SIM Status
#SIMDET	•	•	•	•	•	•	SIM Detection 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

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
$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 for Positioning Protocol for A-GLONASS
$LOCMODE			•				GPS Location Request Mode
$NMEA			•				Enable NMEA Stream
$LOCATION			•				Enable Location Services
$GETLOCATION			•				Get Current Location
#LOCAUTOSTART	•	•	•	•	•	•	GNSS Auto Start Configuration
#LOCNMEATYPE	•	•	•	•	•	•	NMEA Type Configuration
#BND	•	•	•	•	•	•	Select Band
#RXDIV	•	•		•	•		Enable RX Diversity and set DARP
#RXTOGGLE	•	•		•	•		Swap 3G-RX from main to diversity
#SMSFORMAT		•					Select 3GPP or 3GPP2 Format for MO SMS
#ISMSCFG		•					Domain Configuration for Outgoing SMS
#LRXDIV	•	•	•	•	•	•	Enable LTE RX Diversity
#FASTSHDN	•	•	•	•	•	•	Configure Fast Power Down
#VCDISABLE	•	•	•	•	•	•	Disable Voice Call
#NVIM	•	•	•	•	•	•	Non-Volatile Memory Item Management
#TESTMODE	•	•	•	•	•	•	Enable Test Mode command in not signaling mode
#MONI	•	•	•	•	•	•	Cell Monitor
#CQI	•	•	•	•	•	•	Channel Quality Indication
#RFSTS	•	•	•	•	•	•	Read Current Network Status

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
#SERVINFO	•	•	•	•	•	•	Serving Cell Information
#NITZ	•	•	•	•	•	•	Network Time zone
#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
#GETFWEXT	•		•	•		•	Extended get firmware status
#ACTIVEFWEXT	•		•	•		•	Extended active firmware
#FWPLS	•		•	•		•	Firmware PLMN ID Selection
#FIRMWARE	•	•	•	•	•	•	Active firmware and display firmware
#CAINFO	•	•	•	•	•	•	Show LTE CA information
#LAPS	•	•	•	•	•	•	LTE Antenna Ports Signals
#PSMWDISACFG	•	•	•	•	•	•	Power Saving Mode configuration
#PSMEVTCFG	•	•	•	•	•	•	Wake Up event configuration
#PSMWAKENCFG	•	•	•	•	•	•	WAKE_N pin configuration
#PSMEVT	•	•	•	•	•	•	Get Wake up events
#ICMP	•	•	•	•	•	•	ICMP Support
#ICMCONNECT	•	•	•	•	•	•	ECM/RNDIS interface connection
#ICMLANCFG	•	•	•	•	•	•	Private IP address for ECM/RNDIS and GW, DHCP address setting
#ICMROAMINGEN	•	•	•	•	•	•	Enable roaming datacall
#HOSTODIS				•			Host Odis parameters management
#TMLVL	•	•	•	•	•	•	Thermal mitigation level
#SHDNIND	•	•	•	•	•	•	Shutdown Indication
#LTECAT	•	•	•	•	•	•	Set specific LTE category
#WWANLED	•	•	•	•	•	•	Set LED display pattern
#FDOR	•	•	•	•	•		Triggers fast dormancy
#PERSISTAPN	•	•	•	•	•	•	Preserve APN Profile
#QOSINTER	•	•	•	•	•	•	QoS Flow Indication interval

COMMAND	LM960 / LM960A18					LM960A9-P	Function
	Generic	Verizon	Sprint	AT&T	TMUS		
#GETCUSTFEAT	•	•	•	•	•	•	Get the Setting of Customization Feature
#SETCUSTFEAT	•	•	•	•	•	•	Set the Customization Feature
#DGCFG	•	•	•	•	•		Dying GASP Configuration
#DGSTAT	•	•	•	•	•	•	Dying GASP Statistics Management
#DGENABLE	•	•	•	•	•	•	Dying GASP Enable/Disable SMS/Detach Request
#CSURV	•		•			•	Network survey
#CSURVC	•		•			•	Network Survey (Numeric Format)
#SINGLEAPNSWITCH	•	•	•	•	•	•	Set APN param change
#4RXDIS	•	•	•	•	•	•	Set 4RX disable
#UPTIME	•	•	•	•	•	•	Get System Up Time
#CLATENA	•	•	•	•	•	•	Enable/disable the CLAT interface
+ODIS				•			Saving and Retrieving the Odis Parameters

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 LM960 family
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). 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.

Z - Soft Reset	
	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. 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.

&P - Default Reset Full Profile Designation	
	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:

+GCAP - Capabilities List	
	+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

&V1 - S Registers Display	
	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 **<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:

\V - Single Line Connect Message	
	<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>** 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*

Q - Quiet Result Codes	
	AT+CGACT=? **+CGACT: (0,1) nothing is appended to the response**
Reference	V25ter

5.3.2.3. Response Format – V

V - Response Format	
ATV[<n>]	Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (see [§3.2.3 Information Responses And Result Codes] for the table of result codes). Parameter: **<n>** 0 - limited headers and trailers and numeric format of result codes information responses: **<text><CR><LF>** result codes: **<numeric code><CR>** 1 - full headers and trailers and verbose format of result codes (factory default) information responses: **<CR><LF> <text><CR><LF>** result codes: **<CR><LF> <verbose code><CR><LF>** Note: the **<text>** portion of information responses is not affected by this setting. Note: if parameter is omitted, the command has the same behaviour of ATV0
Reference	V25ter

5.3.2.4. Extended Result Codes – X

X - Extended Result Codes	
ATX[<n>]	Set command selects the result code messages subset used by the modem to inform the **DTE** of the result of the commands. Parameter: **<n>**

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

5.3.2.5. Identification Information – I

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

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

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

&C - Data Carrier Detect (DCD) Control	
	Parameter: **<n>** 0 - **DCD** remains **high** always. 1 - **DCD** follows the Carrier detect status: if carrier 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) 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.

&D - Data Terminal Ready (DTR) Control	
	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

5.3.2.8. 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

5.3.2.9. 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.

5.3.2.10. 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.

5.3.2.11. 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**

5.3.2.12. 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 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

5.3.2.13. 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>**)

<table>
<tr><th colspan="2">+IFC - DTE-Modem Local Flow Control</th></tr>
<tr><td></td><td>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><th><by_te></th><th><by_ta></th></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.</td></tr>
<tr><td>AT+IFC?</td><td>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</td></tr>
<tr><td>AT+IFC=?</td><td>Test command returns all supported values of the parameters <by_te> and <by_ta>.</td></tr>
<tr><td>Reference</td><td>V25ter</td></tr>
</table>

5.3.2.14. DTE-Modem Character Framing - +ICF

+ICF - DTE-Modem Character Framing	
AT+ICF=[<format> **,[<parity>]]**	Set command defines the asynchronous character framing to be used when autobauding is disabled. Parameters: **<format>** - determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame. 1 - 8 Date, 2 Stop 2 - 8 Data, 1 Parity, 1 Stop 3 - 8 Data, 1 Stop (factory default) 5 - 7 Data, 1 Parity, 1 Stop **<parity>** - determines how the parity bit is generated and checked, if present; setting this sub parameter is mandatory and has a meaning only if **<format>** subparameter is either 2 or 5 otherwise is not allowed. 0 - Odd (not supported) 1 - Even (not supported) 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*

+ICF - DTE-Modem Character Framing	
	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 definition (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.

+DS – Data Compression	
	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.

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***).
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**.

S3 - Command Line Termination Character	
	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**) 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**. 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:

S12 - Escape Prompt Delay	
	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 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.
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**.
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:

+CNUM - Subscriber Number	
	<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**)
AT+COPN=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007

5.4.3.3. Network Registration Report - +CREG

+CREG – Network Registration Report	
AT+CREG=[<mode>]	Set command enables/disables network registration reports depending on the parameter <**mode**>. **Parameter:** **<mode>** 0 - disable network registration unsolicited result code (factory default)

+CREG – Network Registration Report	
	1 - enable network registration unsolicited result code 2 - enable network registration unsolicited result code with network Cell identification data If **<mode>=1**, network registration result code reports: **+CREG: <stat>** **Where:** **<stat>** 0 - not registered, ME is not currently searching a new operator to register to 1 - registered, home network 2 - not registered, but ME is currently searching a new operator to register to 3 - registration denied 4 - unknown 5 - registered, roaming **If <mode>=2**, network registration result code reports: **+CREG: <stat>[,[<lac>],[<ci],[<AcT>]]** **Where:** **<lac>:** string type; two byte location area code (when <Act> indicates value 0 to 6). In hexadecimal format **<ci>:** string type; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format. **<Act> :** integer type; access technology of the serving cell 0 GSM 2 UTRAN 7 E-UTRAN **Note: <lac>,<ci> and <Act>** are reported only if **<mode>=2** and the mobile is registered on some network cell. **Note:** LM960 family 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>]**

+CREG – Network Registration Report	
	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 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)**.

+CEREG – EPS Network Registration Status	
	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 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

+CEREG – EPS Network Registration Status	
	Note: **<tac>, <ci>** and **<AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell. **Note 2:** 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. **Note 3:** 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
AT+CEREG?	Read command returns the status of result code presentation mode **<n>** and the integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format: **+CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]]** Note: **<tac>, <ci>** and **<AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CEREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

5.4.3.5. Operator Selection - +COPS

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

+COPS – Operator Selection	
	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:** LM960 family 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

+COPS – Operator Selection	
	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.

+WS46 – PCCA STD-101 Select Wireless Network	
	Note: <n> parameter setting is stored in NVM and available at once. **Note:** The Generic, AT&T, TMUS and Verizon variants can set support **<n>** parameter values 22, 28 and 31 only. The 31 is factory default. **Note:** The Sprint module 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

5.4.3.7. Facility Lock/Unlock - +CLCK

+CLCK - Facility Lock/Unlock	
AT+CLCK= **<fac>,<mode>** **[,<passwd>** **[,<class>]]**	Execution command is used to lock or unlock a **ME** on a network facility. Parameters: **<fac>** - facility "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>**)

+CLCK - Facility Lock/Unlock	
	"PN" - network Personalisation "PU" - network subset Personalisation "PP" - service Provider Personalization "PC" - Corporate Personalization "PF" - lock Phone to the very First inserted SIM card (MT asks password when other than the first SIM card is inserted) **<mode>** - defines the operation to be done on the facility 0 - unlock facility 1 - lock facility 2 - query status **<passwd>** - shall be the same as password specified for the facility from the **DTE** user interface or with command Change Password **+CPWD** **<class>** - sum of integers each representing a class of information (default is 7) 1 - voice (telephony) 2 - data (refers to all bearer services) 4 - fax (facsimile services) 8 - short message service 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
AT+CLCK=?	Test command reports all the facilities supported by the device.
Reference	3GPP TS 27.007

+CLCK - Facility Lock/Unlock	
Example	*Querying such a facility returns an output on three rows, the first for voice, the second for data, the third for fax:* AT+CLCK =”AO”,2 +CLCK: <status>,1 +CLCK: <status>,2 +CLCK: <status>,4

5.4.3.8. Change Facility Password - +CPWD

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

+CPWD - Change Facility Password	
	<oldpwd> - string type, it shall be the same as password specified for the facility from the ME user interface or with command **+CPWD**. **<newpwd>** - string type, it is the new password Note: parameter **<oldpwd>** is the old password while **<newpwd>** is the new one.
AT+CPWD=?	Test command returns a list of pairs **(<fac>,<pwdlength>)** which presents the available facilities and the maximum length of their password (**<pwdlength>**)
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

+CPOL – Preferred Operator List	
	<GSM_Compact_AcT> - GSM compact access technology 0 – access technology not selected 1 – access technology selected **<UTRA_AcT>** - UTRA access technology 0 – access technology not selected 1 – access technology selected **<E-UTRAN_AcT*n*>** - E-UTRAN access technology: 0 – access technology not selected 1 – access technology selected **Note:** if **<index>** given but **<oper>** left out, the entry deleted. If **<oper>** given but **<index>** left out, **<oper>** put in the next free location. If only **<format>** given, the format of the **<oper>** in the read command changes. Currently **<GSM_Compact_AcT>** not supported but set value is acceptable. **Note:** LM960 family 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)

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

5.4.4. 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: 4 the called phone has answered to your call

+CPAS – Phone Activity Status	
	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]** 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>**.
AT+CFUN=?	Test command returns the list of supported values for **<fun>** and **<rst>**.
Reference	3GPP TS 27.007

5.4.4.3. Enter PIN - +CPIN

+CPIN - Enter PIN	
AT+CPIN=<pin> **[,<newpin>]**	Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN required is SIM PUK or SIM PUK2, the **<newpin>** is required. This second pin, **<newpin>** will replace the old pin in the SIM. The command may be used to change the SIM PIN by sending it with both parameters **<pin>** and **<newpin>** when PIN request is pending; if no PIN request is pending the command will return an error code and to change the PIN the command **+CPWD** must be used instead. Parameters: **<pin>** - string type value **<newpin>** - string type value. To check the status of the PIN request use the command **AT+CPIN?**
AT+CPIN?	Read command reports the PIN/PUK/PUK2 request status of the device in the form: **+CPIN: <code>** where: **<code>** - PIN/PUK/PUK2 request status code READY - ME is not pending for any password SIM PIN - ME is waiting SIM PIN to be given SIM PUK - ME is waiting SIM PUK to be given PH-SIM PIN - ME is waiting phone-to-SIM card password to be given PH-FSIM PIN - ME is waiting phone-to-very first SIM card password to be given PH-FSIM PUK - ME is waiting phone-to-very first SIM card unblocking password to be given SIM PIN2 - ME is waiting SIM PIN2 to be given; this **<code>** is returned only when the last executed command resulted in PIN2 authentication failure (i.e. **+CME ERROR: 17**) SIM PUK2 - ME is waiting SIM PUK2 to be given; this **<code>** is returned only when the last executed command resulted in PUK2 authentication failure (i.e. **+CME ERROR: 18**) PH-NET PIN - ME is waiting network personalization password to be given PH-NET PUK - ME is waiting network personalization unblocking password to be given

+CPIN - Enter PIN	
	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

5.4.4.4. Signal Quality - +CSQ

+CSQ - Signal Quality	
AT+CSQ	Execution command reports received signal quality indicators in the form: **+CSQ: <rssi>,<ber>** where **<rssi>** - received signal strength indication 0 - (-113) dBm or less 1 - (-111) dBm 2..30 - (-109)dBm..(-53)dBm / 2 dBm per step 31 - (-51)dBm or greater 99 - not known or not detectable <**ber**> - bit error rate 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]: 0: (-4) to (-3) 1: (-6) to (-5)

+CSQ - Signal Quality	
	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:** LM960 family does not support GSM access technology.
AT+CSQ=?	Test command returns the supported range of values of the parameters **<rssi>** and **<ber>**. Note: although +**CSQ** is an execution command without parameters, ETSI 07.07 requires the Test command to be defined.
Reference	3GPP TS 27.007

5.4.4.5. Indicator Control - +CIND

+CIND - Indicator Control	
AT+CIND= **[<state>**	Set command is used to control the registration state of ME indicators, in order to automatically send the **+CIEV** URC, whenever

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

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

5.4.4.6. Mobile Equipment Event Reporting - +CMER

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

+CMER - Mobile Equipment Event Reporting	
	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, 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 - Mobile Equipment Event Reporting	
	+CMER: (list of supported <mode>s),(list of supported <keyp>s), (list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s)
Reference	3GPP TS 27.007

5.4.4.7. Select Phonebook Memory Storage - +CPBS

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

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

5.4.4.8. Read Phonebook Entries - +CPBR

+CPBR - Read Phonebook Entries	
AT+CPBR= **<index1>** **[,<index2>]**	Execution command returns phonebook entries in location number range **<index1>**..**<index2>** from the current phonebook memory storage selected with **+CPBS**. If **<index2>** is omitted, only location **<index1>** is returned. Parameters: **<index1>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see +CPBS). **<index2>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see +CPBS). The response format is: **[+CPBR:** **<index1>**,**<number>**,**<type>**,**<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]**[<CR><LF>** **+CPBR:** **<index2>**,**<number>**,**<type>**,**<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]**[…]]]** where: **<index*n*>** - the location number of the phonebook entry **<number>** - string type phone number of format **<type>** **<type>** - type of phone number octet in integer format 129 - national numbering scheme 145 - international numbering scheme (contains the character "**+**") **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.**

+CPBR - Read Phonebook Entries	
	<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 **<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>

+CPBR - Read Phonebook Entries	
	<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

5.4.4.9. Find Phonebook Entries - +CPBF

+CPBF - Find Phonebook Entries	
AT+CPBF= <findtext>	Execution command returns phonebook entries (from the current phonebook memory storage selected with **+CPBS**) which alphanumeric field start with string **<findtext>**. Parameter: **<findtext>** - string type; used character set should be the one selected with command **+CSCS.**

+CPBF - Find Phonebook Entries	
	The command returns a report in the form: **[+CPBF: <index1>,<number>,<type>,<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]**[<CR><LF>** **+CPBF: <index2>,<number>,<type>,<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>] **[…]]]** where: **<index*n*>** - the location number of the phonebook entry **<number>** - string type phone number of format **<type>** **<type>** - type of phone number octet in integer format 129 - national numbering scheme 145 - international numbering scheme (contains the character "**+**") **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.** <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS <hidden>: indicates if the entry is hidden or not 0: phonebook entry not hidden 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.

+CPBF - Find Phonebook Entries	
	Note: if no PB records satisfy the search criteria then an **ERROR** message is reported.
AT+CPBF=?	Test command reports the maximum lengths of **<number>** and **<text>** fields, in the format: **+CPBF:** **<nlength>,<tlength>**,<glength>,<slength>,<elength> where: **<nlength>** - maximum length of field **<number>**, integer type **<tlength>** - maximum length of field **<text>**, integer type <glength>: integer type value indicating the maximum length of field <group> <slength>: integer type value indicating the maximum length of field <secondtext> <elength>: integer type value indicating the maximum length of field <email> Note: the value of **<nlength>** could vary, depending on the availability of Extension service, in the following situations: if "SM" memory storage has been selected (see +CPBS) and the **SIM** supports the **Extension1** service if "FD" memory storage has been selected (see +CPBS) and the **SIM** supports the **Extension2** service if "MB" memory storage has been selected (see +CPBS) and the **SIM** supports the **Extension6** service Note : Remember to select the PB storage with **+CPBS** command before issuing PB commands.
Example	AT+CPBS="ME" Selecting phonebook OK AT+CPBF="J" Searching for string "J" +CPBF: 1,"01048771234",129,"James" +CPBF: 2,"0169998888",129,"Jane" OK Searching for everything in phone book, and finding all entries AT+CPBF=""

+CPBF - Find Phonebook Entries	
	+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>** **[,<hidden>]]]]]]]]**	Execution command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with +CPBS. Parameters: **<index>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see +CPBS). **<number>** - string type, phone number in the format **<type>** **<type>** - the type of number 129 - national numbering scheme 145 - international numbering scheme (contains the character "**+**") **<text>** - the text associated to the number, string type; used character set should be the one selected with command **+CSCS**. <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS

+CPBW - Write Phonebook Entry	
	<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: (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

+CPBW - Write Phonebook Entry	
	2. if “FD” memory storage has been selected (see +CPBS) and the **SIM** supports the **Extension2** service 3. if “MB” memory storage has been selected (see +CPBS) and the **SIM** supports the **Extension6** service
Reference	3GPP TS 27.007
Example	AT+CPBW=? +CPBW: (1-100),40,(129, 145),255 OK AT+CPBW=6,"18651896699",129,"John" OK
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.

5.4.4.11. Clock Management - +CCLK

AT+CCLK – Clock Management	
AT+CCLK=<time>	Set command sets the real-time clock of the **ME**. Parameter: **<time>** - current time as quoted string in the format: "**yy/MM/dd,hh:mm:ss±zz**" **yy** - year (two last digits are mandatory), range is 00..99 **MM** - month (two last digits are mandatory), range is 01..12 **dd** - day (two last digits are mandatory); The range for dd (day) depends both on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31) Trying to enter an out of range value will raise an error **hh** - hour (two last digits are mandatory), range is 00..23 **mm** - minute (two last digits are mandatory), range is 00..59 **ss** - seconds (two last digits are mandatory), range is 00..59 **±zz** - time zone (indicates the difference, expressed in quarter of an hour, Between the local time and GMT; two last digits are mandatory), range is -47..+48

AT+CCLK – Clock Management	
AT+CCLK?	Read command returns the current setting of the real-time clock, in the format **<time>.** Note: the three last characters of **<time>**, i.e. the time zone information, are returned by **+CCLK?** Only if the **#NITZ** URC 'extended' format has been enabled (see **#NITZ**).
AT+CCLK=?	Test command returns the **OK** result code.
Example	AT+CCLK="15/04/07,22:30:00+00" OK AT+CCLK? +CCLK: "02/09/07,22:30:25" OK
Reference	3GPP TS 27.007

5.4.4.12. Setting date format - +CSDF

AT+CSDF – setting date format	
AT+CSDF=[<mode>[,<auxmode>]]	This command sets the date format of the date information presented to the user, which is specified by use of the **<mode>** parameter. The **<mode>** affects the date format on the phone display and doesn't affect the date format of the AT command serial interface, so it not used. The command also sets the date format of the TE-TA interface, which is specified by use of the **<auxmode>** parameter (i.e., the **<auxmode>** affects the **<time>** of AT+CCLK). 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>:**

AT+CSDF – setting date format	
	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.

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

+CTZU – Automatic Time Zone update	
	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= **<command>** **[,<fileid>** **[,<P1>,<P2>,<P3>** **[,<data>[,<pathid>]]]]**	Execution command transmits to the **ME** the SIM **<command>** and its required parameters. **ME** handles internally all **SIM-ME** interface locking and file selection routines. As response to the command, **ME** sends the actual SIM information parameters and response data. Parameters: **<command>** - command passed on by the **ME** to the SIM 176 - READ BINARY 178 - READ RECORD 192 - GET RESPONSE 214 - UPDATE BINARY 220 - UPDATE RECORD 242 - STATUS **<fileid>** - identifier of an elementary data file on SIM. Mandatory for every command except STATUS. **<P1>**,**<P2>**,**<P3>** - parameter passed on by the ME to the SIM; they are mandatory for every command except GET RESPONSE and STATUS 0..255 **<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.

+CRSM - Restricted SIM Access	
	<response> - on a successful completion of the command previously issued it gives the requested data (hexadecimal character format). It's not returned after a successful UPDATE BINARY or UPDATE RECORD command. Note: this command requires PIN authentication. However commands READ BINARY and READ RECORD can be issued before PIN authentication and if the SIM is blocked (after three failed PIN authentication attempts) to access the contents of the Elementary Files. Note: use only decimal numbers for parameters **<command>**, **<fileid>**, **<P1>**, **<P2>** and **<P3>**.
AT+CRSM=?	Test command returns the **OK** result code
Example	Read binary, ICCID(2FE2) AT+CRSM=176,12258,0,0,10 +CRSM: 144,0,98285070200110768 6F4 OK Read record, ADN(6F3A) AT+CRSM=178,28474,1,4,40 +CRSM: 144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFF0681 105678 9282FFFFFFFFFFFFFF OK Update Binary, KcGPRS(6F52) AT+CRSM=214,28498,0,0,7,C69018C7958C87 +CRSM: 144,0 OK Update Record, ADN(6F3A) AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF +CRSM: 144,0 OK

+CRSM - Restricted SIM Access	
	Status, FPLMN(6F7B) AT+CRSM=242,28539 +CRSM: 144,0,623C820238218410A0000000871002FFFFFFFF8904 0300FFA5118001318103010A3282011E8304000030E08A01058B032F0609C6099001C0830101830181 OK Get Response, MSISDN(6F40) AT+CRSM=192,28480,4,0,4,,7F106F40 +CRSM: 144,0,621E820542210026028302 6F40A5039201008A01058B036F06058002004C8800 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:

+CSIM – Generic SIM Access	
	<**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: <**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,"000002A87F2002000000000009930022080083 8A838A9000" 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*

+CSIM – Generic SIM Access	
	AT+CSIM=14,A0A40000026F30 +CSIM: 4,”9F0F” OK *READ BINARY* AT+CSIM=10,A0B00000FC +CSIM:508,”FFFFFF1300831300901300541300301300651300381 300801301801300011311091301301300981300771300591300431 30081130095130140130023130016330420130041FFFFFFFFFFF 21436542F41922F28822F201FFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFF9000” OK **<u>3G UICC (3G TS 31.101):</u>** *STATUS* AT+CSIM=10,A0F2000016 +CME ERROR: operation not supported *STATUS* AT+CSIM=10,80F2000016 +CSIM:134,"623F8202782183027FF08410A0000000871002FFFFF FFF89060400FFA5078001718302848 28A01058B032F0602C6129 0017883010183010A83010B83010E8301819000" 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,"621E8202412183026F30A506C00140DE01008A01058 B036F060480 02006988009000" OK *READ BINARY* AT+CSIM=10,00B0000069 +CSIM:214,"02F81012F47022F83082F63082F64022F60192F3141

+CSIM – Generic SIM Access	
	2F60313006132F40102F20162F21032F23002F60182F41012F910 42F41902F46102F40242F22092F52072F22062F03062F86032F01 032F11042F01032F80217F60127F42027F43027F44027F24337F6 2037F0209000" OK
Note	For the following instructions (value of the second byte): A4 : SELECT 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. 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”

+CPUC - Price Per Unit And Currency Table	
	<pwd> - SIM PIN2; if PIN2 has been already input once after startup, it is required no more
AT+CPUC?	Read command reports the current values of **<currency>** and **<ppu>** parameters in the format: **+CPUC : <currency>,<ppu>**
AT+CPUC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.21. 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)

+CCHO – Open Logical Channel	
	4 operation not supported (wrong format or parameters of the command) 13 SIM failure (SIM response SW1 SW2 status byte Error) 15 SIM wrong (SIM response SW1 SW2 status byte Error) 21 invalid index (not correspond to an opened channel) 100 unknown (generic error) Note: The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 for further information on logical channels in APDU commands protocol.
AT+CCHO=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.007

5.4.4.22. Close Logical Channel - +CCHC

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

5.4.4.23. Generic UICC Logical Channel Access - +CGLA

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

+CGLA – Generic UICC Logical Channel Access	
	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 EF_{DIR} 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 EF_{DIR}.
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 description of command +CPIN, <code> parameter, except 'READY', 'PH-SIM PIN') The response format is: +CPINR: <code>,<retries>[,<default_retries>][<CR><LF> +CPINR: <code>,<retries>[,<default_retries>][…]]

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

5.4.4.26. 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) **<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

+CSVM – Set 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. 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.

+CPNER – Primary Notification Event Reporting	
	<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 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)

+CESQ – Extended Signal Quality	
	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 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

+CESQ – Extended Signal Quality	
	<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:** LM960 family 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

+CMEE - Report Mobile Equipment Error	
	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.
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:

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

+CGEREP – Packet domain Event Reporting	
AT+ CGEREP?	Read command returns the current <mode> and <bfr> settings, in the format: **+CGEREP: <mode>,<bfr>**
AT+ CGEREP=?	Test command reports the supported range of values for the **+CGEREP** command parameters.
Example	AT+CGEREP=? +CGEREP: (0-2),(0,1)
Reference	3GPP TS 27.007

5.4.6.4. GPRS Network Registration Status - +CGREG

+CGREG - GPRS Network Registration Status	
AT+CGREG=[<n>]	Set command controls the presentation of an unsolicited result code **+CGREG: (see format below)**. Parameter: **<n>** - result code presentation mode 0 - disable network registration unsolicited result code 1 - enable network registration unsolicited result code; if there is a change in the terminal network registration status for Packet Service, it is issued the unsolicited result code: **+CGREG: <stat>** where: **<stat>** - registration status 0 - not registered, terminal is not currently searching a new operator to register to 1 - registered, home network 2 - not registered, but terminal is currently searching a new operator to register to 3 - registration denied 4 - unknown 5 - registered, roaming 2 - enable network registration and location information unsolicited result code; if there is a change of the network cell, it is issued the unsolicited result code:

+CGREG - GPRS Network Registration Status	
	+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 **<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:** LM960 family 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

+CGDCONT - Define PDP Context	
	<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. Note : if emergence indication is enabled, this profile can not be used attached profile.

+CGDCONT - Define PDP Context	
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>** **[,<delay>** **[,<reliability>** **[,<peak>** **[,<mean>]]]]]]**	Set command allows specify a minimum acceptable profile, checked by the terminal against the negotiated profile returned in the Activate PDP Context Accept message. **Parameters:** **<cid>** - PDP context identification (see **+CGDCONT** command). **<precedence>** - precedence class 0 - 3 (default 0) **<delay>** - delay class

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

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

5.4.6.8. 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 bitrate UL>** **[,<Maximum bitrate DL>** **[,<Guaranteed bitrate UL>** **[,<Guaranteed bitrate DL>** **[,<Delivery order>** **[,<Maximum SDU size>**	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network. Parameters:

[,<SDU error ratio> [,<Residual bit error ratio> **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority> [,<Source statistics descriptor> [,<Signalling indication>]]]]]]]]]]]]]]**	**<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>**	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)

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
[,<SDU error ratio> **[,<Residual bit error ratio>** **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority>[,<Source statistics descriptor>** **[,<Signalling indication>]]]]]]]]]]]	1 - 568, 576 - 11520 **<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”

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

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

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	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. Parameters: **<cid>** - PDP context identification (see **+CGDCONT** command).

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
AT+CGEQNEG=?	Test command returns a list of <**cid**>s associated with active contexts.
Example	AT+CGEQREQ? +CGEQREQ: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0 OK AT+CGACT=1,1 OK 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 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 – Set mode of operation for EPS.	
	+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) 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>[…]]**

+CGACT - PDP Context Activate Or Deactivate	
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 **<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

+CGPADDR - Show PDP Address	
	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): 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

+CGCMOD – Modify PDP context	
	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>,** **<UL_GBR>** **[,<DL_MBR>,<UL_MBR]]** **]]**	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. **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+CGCONTRDP=[<cid>]	The execution command returns the relevant information:

	<bearer_id>, <apn>, <ip_addr>, <subnet_mask>,<gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr> and **<P-CSCF_sec_addr>** for a non- secondary PDP Context established by the network with the primary context identifier <**cid**>. If the context can't be found an **ERROR** response is returned. If the parameter <**cid**> omitted, the relevant information for all established PDP contexts returned. **Possible response(s):** **+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<ip_addr>, <subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>** **[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>]]]]]][<CR><LF>** **+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<ip_addr>,** **<subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>** **[,<PCSCF_prim_addr>[,<PCSCF_sec_addr>]]]]][…]]** NOTE**:** The dynamic part of the PDP context will only exist if established by the network. The test command returns a list of <cid>s associated with active contexts. **Defined values:** **<cid> -** a numeric parameter specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and used in other PDP context-related commands. **<bearer_id> -** a numeric parameter identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS. **<APN> -** a string parameter which is a logical name that was used to select the GGSN or the external packet data network. **<ip_addr> -** a string parameter shows the IP Address of the MT. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8" for IPv6. If the MT has dual stack capabilities the string shows first the dot separated IPv4 Address followed by the dot Separated IPv6 Global Prefix Address. The IPv4 address and the IPv6 address parameters are separated by space: "a1.a2.a3.a4 a1:a2:a3:a4:a5:a6:a7:a8"

	<subnet_mask> - a string parameter shows the subnet mask for the IP Address of the MT. The string given as dot-separated numeric (0-255) parameters. If the MT has dual stack capabilities the string shows the dot separated IPV4 subnet mask followed by the dot Separates IPV6 subnet mask. The subnet masks are separates by space. **<gw_addr> -** a string parameter shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Gateway address followed by the dot separated IPV6 Gateway Address. The gateway addresses are separated by space. **<DNS_prim_addr> -** a string parameter which shows the IP Address of the primary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server. **<DNS_sec_addr> -** a string parameter which shows the IP address of the secondary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server. **<P_CSCF_prim_addr> -** a string parameter which shows the IP Address of the primary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 primary Address of P-CSCF Server. **<P_CSCF_sec_addr> -** a string parameter which shows the IP Address of the secondary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of P-CSCF Server.
AT+CGCONTRDP?	Read command returns ERROR.
AT+CGCONTRDP=?	**+CGCONTRDP: (list of <cid>s associated with active contexts)**
Example	AT+CGACT=1,1 OK AT+CGCONTRDP=?

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

5.4.6.18. 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
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.

+CBC - Battery Charge	
Reference	3GPP TS 27.007

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

5.5.1. General Configuration

5.5.1.1. Select Message Service - +CSMS

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

+CSMS - Select Message Service	
	<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. **<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)

+CPMS - Preferred Message Storage	
	"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 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 129 - national numbering scheme 145 - international numbering scheme (contains the character "**+**") Note: for Verizon FW, the range of **<type>** is 0 - 255. 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.

+CSCA -Service Center Address	
	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 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*

+CSMP - Set Text Mode Parameters	
	[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**) 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

+CSMP - Set Text Mode Parameters	
	[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: < 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

+CSMP - Set Text Mode Parameters	
	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 **<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, only in UMTS NW) 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).

+CSAS - Save Settings	
	1..n - SIM profile number; the value of n depends on the SIM and its max is 3. Note: certain settings may not be supported by the SIM and therefore they are always saved to NVM, regardless the value of **<profile>**. Note: If parameter is omitted the settings are saved in the non-volatile memory.
AT+CSAS=?	Test command returns the possible range of values for the parameter **<profile>**.
Reference	3GPP TS 27.005

5.5.2.6. Restore Settings - +CRES

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

5.5.2.7. More Message to Send - +CMMS

+CMMS – More Message to Send	
AT+CMMS=[<n>]	Set command controls the continuity of SMS relay protocol link. Multiple messages can be sent much faster as link is kept open. Parameter:

+CMMS – More Message to Send	
	<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. 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 pr eference : **+CGSMS: <service>**
AT+CGSMS=?	Test command reports the supported range of values for parameter **<service>**
Reference	3GPP TS 27.007

5.5.3. Message Receiving And Reading

5.5.3.1. New Message Indications To Terminal Equipment - +CNMI

+CNMI - New Message Indications To Terminal Equipment	
AT+CNMI=[<mode>[,<mt> [,<bm>[,<ds> [,<bfr>]]]]]	Set command selects the behaviour of the device on how the receiving of new messages from the network is indicated to the **DTE**. Parameter: **<mode>** - unsolicited result codes buffering option 0 - Buffer unsolicited result codes in the **TA**. If **TA** result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 - Discard indication and reject new received message unsolicited result codes when **TA-TE** link is reserved, otherwise forward them directly to the **TE**. 2 - Buffer unsolicited result codes in the TA in case the **DTE** is busy and flush them to the TE after reservation. Otherwise, forward them directly to the TE. 3 - if **<mt>** is set to 1, the hardware ring line enabled for 1 second when a SMS is received while the module is in online data mode. **<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:

+CNMI - New Message Indications To Terminal Equipment	
	<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 "**+**") Note: for Verizon FW, the range of ***<tooa>*, <tosca>** is 0 - 255. ***<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)

+CNMI - New Message Indications To Terminal Equipment	
	Class 2 messages and messages in the message waiting indication group (stored message) result in indication as defined in **<mt>=1**. 3 - Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in **<mt>=2**. Messages of other data coding schemes result in indication as defined in **<mt>=1**. **<bm>** - broadcast reporting option 0 - Cell Broadcast Messages are not sent to the **DTE** 2 - New Cell Broadcast Messages are sent to the **DTE** with the unsolicited result code: **(PDU Mode)** **+CBM: <length><CR><LF><PDU>** where: **<length>** - PDU length **<PDU>** - message PDU **(TEXT Mode)** **+CBM:<sn>,<mid>,<dcs>,<pag>,<pags><CR><LF><data>** where: **<sn>** - message serial number **<mid>** - message ID **<dcs>** - Data Coding Scheme **<pag>** - page number **<pags>** - total number of pages of the message **<data>** - CBM Content of Message • If **<dcs>** indicates that 3GPP TS 23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS) • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41) **<ds>** - SMS-STATUS-REPORTs reporting option 0 - status report receiving is not reported to the **DTE** and messages are stored 1 - the status report is sent to the **DTE** with the following unsolicited result code: **(PDU Mode)**

+CNMI - New Message Indications To Terminal Equipment	
	+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 **<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

+CNMI - New Message Indications To Terminal Equipment	
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 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

+CMGL - List Messages	
	<pdu> - message in PDU format according to 3GPP TS 23.040 **(Text Mode)** Parameter: **<stat>** "REC UNREAD" - new message "REC READ" - read message "STO UNSENT" - stored message not yet sent "STO SENT" - stored message already sent "ALL" - all messages. Each message to be listed is represented in the format (the information written in italics will be present depending on +CSDH last setting): **+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>*[,<tooa/toda>,<length>]*<CR><LF> <data>** where **<index>** - message position in the storage **<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 "**+**") Note: for Verizon FW, the range of ***<tooa/toda>*** is 0 - 255. ***<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)

+CMGL - List Messages	
	Each message delivery confirm is represented in the format**:** **+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>** where **<index>** - message position in the storage **<stat>** - message status **<fo>** - first octet of the message PDU **<mr>** - message reference number **<ra>** - recipient address, string type , represented in the currently selected character set (see **+CSCS**) **<tora>** - type of number **<ra>** **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU Note: If parameter is omitted the command returns the list of SMS with "**REC UNREAD**" status.
AT+CMGL=?	Test command returns a list of supported **<stat>**s
Example	AT+CMGF=1 Set Text mode OK AT+CMGL +CMGL: 1,"REC UNREAD","+821020955219",,"07/07/26,20:05:11+36" SMS Test message +CMGL: 2,"REC UNREAD","+821020955219",,"07/07/26,20:05:58+36" SMS Test message... +CMGL: 3,"REC UNREAD","+821020955219",,"07/07/26,20:06:37+36" SMS Test Message.. +CMGL: 4,"REC UNREAD","+821020955219",,"07/07/26,20:07:43+36" TEST MESSAGE.. +CMGL: 5,"REC UNREAD","+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE

+CMGL - List Messages	
	OK AT+CMGF=0 Set PDU mode OK AT+CMGL=2 +CMGL: 0,2,,24 07912801929190301164 0A8110567892820000A70CF4F29C0E6A97E7F3F0B90C +CMGL: 1,2,,21 07912801929190301164 0A8110516529700000A709027A794E77B95C2E +CMGL: 26,2,,17 08812801009901025911640A8110567892820014A704C7D1B1DB 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

+CMGR - Read Message	
	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. **(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

+CMGR - Read Message	
	<*dcs*> - Data Coding Scheme **<*vp*>** - depending on SMS-SUBMIT **<fo>** setting: Refer to 3GPP TS 23.040 TP-Validity-Period a) Not Present if <**fo**> tells that the Validity Period Format is **Not Present** b) Integer type if <**fo**> tells that the Validity Period Format is **Relative** (default 167) c) Quoted time-string type if <**fo**> tells that the Validity Period Format is **Absolute** d) Quoted hexadecimal representation of 7 octets if <**fo**> tells that the Validity Period Format is **Enhanced**. **<oa>** - Originator address, string type represented in the currently selected character set (see +CSCS) **<da>** - Destination address, string type represented in the currently selected character set (see +CSCS) **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one 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 "**+**") Note: for Verizon FW, the range of **<*tooa*>,<*toda* >,<*tosca*>** is 0 - 255. **<*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

+CMGR - Read Message	
	07912801929190301164 0A8110516529700000A709027A794E77B95C2E OK AT+CMGF=1 OK AT+CMGR=3 +CMGR: “REC READ”,“+821020955219”,,“07/07/19,10:06:34+36” test message/..... OK
Reference	3GPP TS 27.005

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.

+CNMA – New Message Acknowledgement	
(Text Mode) **AT+CNMA**	Only positive acknowledgement to network (RP-ACK) is possible.
(PDU Mode) **AT+CNMA=?**	Test command returns the possible range of values for the parameter <n>
Example	**(PDU Mode)** SMS AT commands compatible with 3GPP TS 27.005 Phase 2+ version. AT+CSMS=1 +CSMS: 1,1,1 OK Set PDU mode. AT+CMGF=0 OK AT+CNMI=2,2,0,0,0 OK Message is received from network. +CMT: “”,70 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

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

5.5.4. Message Sending And Writing

5.5.4.1. Send Message - +CMGS

+CMGS - Send Message	
(PDU Mode) **AT+CMGS= <length>**	**(PDU Mode)** Execution command sends to the network a message. Parameter: **<length>** - length of the PDU to be sent in bytes (excluding the SMSC address octets). 7..164 After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt:

+CMGS - Send Message	
	<CR><LF><greater_than><space> (IRA 13, 10, 62, 32) and waits for the specified number of bytes. Note: the **DCD** signal shall be in **ON** state while PDU is given. Note: the echoing of given characters back from the TA is controlled by echo command **E** Note: the **PDU** shall be hexadecimal format (each octet of the **PDU** is given as two IRA character long hexadecimal number) and given in one line. Note: When the length octet of the SMSC address (given in the **PDU**) equals zero, the SMSC address set with command **+CSCA** is used, in this case, the SMSC Type-of-Address octet shall not be present in the **PDU**. To send the message issue **Ctrl-Z** char (**0x1A** hex). To exit without sending the message issue **ESC** char (**0x1B** hex). If message is successfully sent to the network, then the result is sent in the format: Note : Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned: **+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)	**(Text Mode)**

+CMGS - Send Message	
AT+CMGS=<da> **[,<toda>]**	Execution command sends to the network a message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +CSCS). **<toda>** - type of destination address 129 - number in national format 145 - number in international format (contains the "**+**") Note: for Verizon FW, the range of **<toda>** is 0 - 255. 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).

+CMGS - Send Message	
	If message is successfully sent to the network, then the result is sent in the format: Note : Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned: **+CMGS: <mr>[, <scts>]** where **<mr>** - message reference number. <scts> - TP-Service Centre Time Stamp in Time String Format. Note: if message sending fails for some reason, an error code is reported. Note: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued. Note: it is possible to send a concatenation of at most 10 SMs; the maximum number of chars depends on the **<dcs>**: 1520 chars if 3GPP TS 23.038 default alphabet is used, 1330 chars if 8-bit is used, 660 chars if UCS2 is used
AT+CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	Set PDU mode AT+CMGF=0 OK AT+CMGS=18 > 0881280100990102591155 0B811020905512F90000A704F4F29C0E +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

+CMGS - Send Message	
Reference	3GPP TS 27.005

5.5.4.2. Send Message From Storage - +CMSS

+CMSS - Send Message From Storage	
AT+CMSS=<index>[,<da>[,<toda>]]	Execution command sends to the network a message that is already stored in the **<memw>** storage (see **+CPMS**) at the location **<index>**. Parameters: **<index>** - location value in the message storage **<memw>** of the message to send **<da>** - destination address, string type represented in the currently selected character set (see **+CSCS**); if it is given it shall be used instead of the one stored with the message. **<toda>** - type of destination address 129 - number in national format 145 - number in international format (contains the "**+**") Note: for Verizon FW, the range of **<toda>** is 0 - 255. 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.

+CMSS - Send Message From Storage	
Note	To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	AT+CMGF=1 OK AT+CMGW="0165872928" > test message... +CMGW: 28 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:

+CMGW - Write Message To Memory	
	<index> - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported. Note: care must be taken to ensure that during the command execution, no other SIM interacting commands are issued.
(Text Mode) **AT+CMGW[=<da>** **[,<toda>** **[,<stat>]]]**	**(Text Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +CSCS). **<toda>** - type of destination address. 129 - number in national format 145 - number in international format (contains the "**+**") Note: for Verizon FW, the range of **<toda>** is 0 - 255. **<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

+CMGW - Write Message To Memory	
	that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) Note: the **DCD** signal shall be in ON state while text is entered. Note: the echoing of entered characters back from the TA is controlled by echo command **E** To write the message issue **Ctrl-Z** char (**0x1A** hex). To exit without writing the message issue **ESC** char (**0x1B** hex). If message is successfully written in the memory, then the result is sent in the format: **+CMGW: <index>** where: **<index>** - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported. 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 > 08812801009901025911550B811020905512F90000A704F4F29C0E +CMGW: 29 OK

+CMGW - Write Message To Memory	
	AT+CMGF=1 Set text mode OK AT+CSMP=17,167,0,0 OK AT+CSCA="821029190903",145 OK AT+CMGW="0165872928" > test message... +CMGW: 28 OK
Note	To avoid malfunctions is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

5.5.4.4. Delete Message - +CMGD

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

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

5.5.5. 3GPP2 AT Commands for SMS

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

5.5.5.1. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	
AT+CPMS= **<memr>[,<memw>** **]**	Set command selects memory storages **<memr>**, **<memw>** to be used for reading, writing, sending and storing SMs. Parameters: **<memr>** - memory from which messages are read and deleted "ME" – SMS memory storage into module (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: <usedr>,<totalr>,<usedw>,<totalw>**

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

+CPMS - Preferred Message Storage	
	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 **<enc_type>** - data coding scheme: 0 - 8-bit Octet 2 - 7-bit ASCII (factory default)

+CSMP - Set Text Mode Parameters	
	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.
AT+CSAS=?	Test command returns the possible range of values for the parameter **<profile>**.
Example	AT+CSAS=? +CSAS: (0,1)

+CSAS - Save Settings	
	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

5.5.5.5. New Message Indications To Terminal Equipment - +CNMI

+CNMI - New Message Indications To Terminal Equipment	
AT+CNMI=[<mt>]	Set command selects the behaviour of the device on how the receiving of new messages from the network is indicated to the **DTE**.

+CNMI - New Message Indications To Terminal Equipment	
	Parameter: **<mt>** - The information written in italics will be present depending on +**CSDH** last setting. Unsolicited result codes buffering option 0 - No Indication (factory default) 1 - Indicate like below **+CMTI: <memr>,<index>** **<memr>** - memory storage where the new message is stored "ME" **<index>** - location on the memory where SMS is stored. 2 - Indicate like below (**PDU Mode**) **+CMT: ,<length><CR><LF><pdu>** **<length>** - PDU length **<pdu>** - PDU Message **<pdu>:** **<orig_num><date><tele_id><priority><enc_type><udh><length><data>** where: **<orig_num> : <addr_len><tooa><address>** **<addr_len>** : Octets length of address field(1 Octet : <tooa> and <address>). **<tooa>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets. **<date>** : Serivce center time stamp (6 Octets : YYMMDDHHMMSS). **<tele_id>** : Teleservice ID (2 Octets). **<priority>** : Priority(1 Octet). **<enc_type>** : Encoding type(1 Octet). **<udh>** : User data header (1 Octet). **<length>** : Refer to below **Note** (1 Octet). **<data>** : User data of message. Note:

+CNMI - New Message Indications To Terminal Equipment	
	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 2 - Urgent 3 - Emergency In case of Verizon:

+CNMI - New Message Indications To Terminal Equipment	
	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 OK AT+CNMI? +CNMI: 2

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

5.5.5.6. List Messages - +CMGL

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

+CMGL - List Messages	
	<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. where:

+CMGL - List Messages	
	<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**>. ***<tele_id>*** - Teleservice ID. 4097 - page

+CMGL - List Messages	
	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 0681104139430614102315582010020202002 4C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 OK 06 <addr_len: 6byte> 81 <type_addr: 129> 1041394306 <Origination number: 0114933460>

+CMGL - List Messages	
	141023155820 <Date: 14/10/23,15:58:20> 1002 <Teleservice_id: 4098(decimal)> 02 <priority: urgent > 02 <encoding_type: 7-bit ASCII > 00 <udh: Not present user data header > 24 <data_len: 36> C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 <user_data: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa> Else: AT+CMGL=2 +CMGL: 31,2,“”,23 07801091346554F307801091346554F310020000000A61616161616161616161 OK 07 <addr_len: 7byte> 81 <type_addr:129> 1091346554F3 <Destination_addr: 01194356453> 07 <addr_len: 7byte> 81 <type_addr:129> 1096224658F1 <Callback_Number: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: 8-bit Octet > 00 <udh: Not present user data header > 0A <data_len: 10> 6161616161616161616 <data: aaaaaaaaaa> AT+CMGF=0 OK AT+CMGF? +CMGF: 0 OK

+CMGL - List Messages	
	AT+CMGL=? (0-4) OK AT+CMGL=4 +CMGL: 0,2,“”,19 0681104139430606811041394306100200000006313233343536 +CMGL: 1,2,“”,22 0681104139430606811041394306100200000009313233343536363737 +CMGL: 2,2,“”,25 0681104139430606811041394306100200000C313132323334343434343434 +CMGL: 3,2,“”,28 0681104139430606811041394306100200000F616666617364656565656565656565 OK **(Text Mode)** AT+CMGF=1 OK AT+CMGF? +CMGF: 1 OK AT+CMGL=? (“REC UNREAD”,“REC READ”,“STO UNSENT”,“STO SENT”,“ALL”) OK AT+CMGL=“ALL” +CMGL: 0,“STO UNSENT”,“My Number”,“My Number”, 123456 +CMGL: 1, “STO UNSENT”,“My Number",“My Number”, 123456677 +CMGL: 2, “STO UNSENT”,“My Number",“My Number”, 112234444444 +CMGL: 3, “STO UNSENT”,“My Number",“My Number”,

+CMGL - List Messages	
	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>). **<tooa>** : Type of address(1 Octet). **<addres>** : Address digits with representation of semi-octets.

+CMGR - Read Message	
	<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 0 - new message 1 - read message 2 - stored message not yet sent

+CMGR - Read Message	
	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) 262144 - voice mail notification ***<priority>*** - Priority. Note: The priority is different with every carrier.

+CMGR - Read Message	
	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 0681104139430614102315582010020202002 4C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 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 >

+CMGR - Read Message	
	24 <data_len: 36 > C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E1C3870E10 <user_data: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa> Else: AT+CMGR=31 +CMGR: 2,“”,23 07801091346554F307801091346554F310020000000A61616161616161616161 OK 07 <addr_len: 7byte> 81 <type_addr:129> 1091346554F3 <Destination_addr: 01194356453> 07 <addr_len: 7byte> 81 <type_addr:129> 1096224658F1 <Callback_Number: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: 8-bit Octet > 00 <udh: Not present user data header > 0A <data_len: 10> 61616161616161616161 <data: aaaaaaaaaa> **(Text Mode)** AT+CSDH=1 OK AT+CMGR=1 +CMGR: “REC READ”, “0114933460”, “01149334690”, 20140109180259, 129, 4098,0,2,0,12 TEST MESSAGE OK AT+CMGR=4 +CMGR: “STO UNSENT”,“0114933460”,“0114933460”,,129,4098,0,0,0,12

+CMGR - Read Message	
	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>** where

+CMGS - Send Message	
	<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 >07811091346554F307811096224658F11002000000166262626262626262626262626262626262626262 +CMGS: 4 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <Destination_address:01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129> 1096224658F1 <callback_address:01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: octet > 00 <udh: Not present user data header > 16 <data_len: 22> 626262626262626262626262626262626262626262 <user_data: bbbbbbbbbbbbbbbbbbbbb> AT+CMGS=32 >07811091346554F307811091346554F3100202020014C3870E1C3870E1C387162C58B162C58B1620 +CMGS: 3 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <destination_address:01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <callback_address: 01194356453> 1002 <Teleservice_id: 4098(decimal)> 02 <priority: ungent > 02 <encoding_type: 7-bit ASCII > 00 <udh: Not present user data header > 14 <data_len: 20> C3870E1C3870E1C387162C58B162C58B1620 <user_data: aaaaaaaaaabbbbbbbbbb> Note: If user data header**<udh>** is present,

+CMGS - Send Message	
	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>** where **<mr>** - message reference number.

+CMGS - Send Message	
	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) **AT+CMGW=** **<length>** **[,<stat>]**	**(PDU Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameter: **<length>** - length in bytes of the PDU to be written. (excluding the Destination Address octets) 5..183 **<stat>** - message status. 0 - new message 1 - read message 2 - stored message not yet sent (default) 3 - stored message already sent The device responds to the command with the prompt ‘>’ and waits for the specified number of bytes.

+CMGW - Write Message To Memory	
	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 >07811091346554F307811096224658F11002000000166262626262626262626262626262626262626262 +CMGW: 4 OK 07 <addr_len: 7byte> 81 <type_addr: 129> 1091346554F3 <Destination_address: 01194356453> 07 <addr_len: 7byte> 81 <type_addr: 129> 1096224658F1 <callback_address: 01692264851> 1002 <Teleservice_id: 4098(decimal)> 00 <priority: normal > 00 <encoding_type: octet > 00 <udh: Not present user data header > 16 <data_len: 22> 62626262626262626262626262626262626262626262 <user_data: bbbbbbbbbbbbbbbbbbbbbb>

+CMGW - Write Message To Memory	
	Note: If user data header<udh> is present, If encoding type is 7bit ASCII, <data_len> value is the sum of the number of septets in user data and the number of septets in user data header (including any padding). Otherwise, <data_len> value is the sum of the number of octets in user data and the number of octets in user data header. If user data header<udh> is not present, If encoding type is 7bit ASCII, <data_len> value is the number of septets in user data. Otherwise, <data_len> value is the number of octets in user data.
(Text Mode) **AT+CMGW[=<da>** **[,<toda>** **[,<stat>]]]**	**(Text Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameters: **<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 > Ctrl+Z must be used to write message

+CMGW - Write Message To Memory	
	+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 composition 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 0x1042: RNDIS + DIAG + ADB + NMEA + MODEM + MODEM + AUX 0x1040: DIAG + ADB + RmNet + NMEA + MODEM + MODEM + AUX 0x1041: DIAG + ADB + MBIM + NMEA + MODEM + MODEM + AUX 0x1043: DIAG + ADB + ECM + NMEA + MODEM + MODEM + AUX

#USBCFG- USB Configuration	
	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.
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
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): - 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.

#QSS - Query SIM Status	
	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 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)

#QSS - Query SIM Status	
AT#QSS=?	Test command returns the supported range of values for parameter **<mode>**.
Example	If **AT#SIMDET=0**, AT#QSS? #QSS:0,1,0 OK If **AT#SIMDET=1**, AT#QSS? #QSS: 0,1,1 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 2 - automatic SIM slot2 detection through SIMIN Pin
AT#SIMDET?	Read command reports the currently selected SIM Detection Mode in the format: **#SIMDET: <mode>,<simin>** where: **<mode>** - SIM Detection mode, as before **<simin>** - SIMIN pin real status 0 - SIM not inserted 1 - SIM inserted NOTE: If no SIMIN pin supported in product, **<simin>** will always be '0'.

#SIMDET - SIM Detection Mode	
AT#SIMDET=?	Test command returns the supported range of values for parameter **<mode>**
Example	AT#SIMDET? #SIMDET: 0,0 OK AT#SIMDET=1 OK AT#SIMDET=0 OK

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 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 #SIMPR: 1,1,0 OK Enable the hot-swap function of SIM slot1.

#HSEN – Hot-Swap Enable	
	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 detachment from the network and shut down. Before definitive shut down an **OK** response is returned. Note: after the issuing of this command any previous activity is terminated and the device will not respond to any further command. Note: If VBATT is maintained, module will turn on automatically after shutdown.

#SHDN - Software Shutdown	
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 1 – enable ENS functionality; If AT#ENS=1 has been issued the following values will be automatically set: (default) 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>**.
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>**:

#EONS - Enable URC of Enhanced Operator Name String	
	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 configuration of the general purpose pin or reads current state of the general purpose pin. Not all configuration for the three parameters are valid. Parameters: **<pin>** - GPIO pin number. The supported range is hardware dependent. Use **AT#GPIO=?** test command to know available range. **<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 current direction and value of **GPIO<pin>** 3 - if **<dir>=0** (INPUT), enable Pull-Up

#GPIO - General Purpose Input/Output Pin Control	
	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. When **<mode>=2,** the command reports the direction and value of **GPIO<pin>** in the format (following parameters **<dir>, <save>** are ignored): **#GPIO: <dir>,<stat>[,<mode>]** where: **<dir>** - current direction setting of the **GPIO<pin>** Note: **<dir>=4, 5, 6** and **7** are Alternate function as below. 4 - pin is for “Temp monitor” and available for all GPIOs. This value is only possible to set by #TEMPSENS 5 - pin is for “Fast power down” and available for all GPIOs. This value is only possible to set by #FASTSHDN 6 - pin is for “Shutdown indicator” and available for all GPIOs. This value is only possible to set by #SHDNIND 7 - pin is for “Dying Gasp Trigger” and available for all GPIOs. This value is only possible to set by #SETCUSTFEAT with <cust_id>=“DGENABLE” **<stat>** • logic value read from **GPIO<pin>** in the case the pin **<dir>** is set to input. • the last setting value of the **GPIO<pin>** in the case the pin **<dir>** is output. • no meaning value for the **GPIO<pin>** in the case the pin **<dir>** is set to alternate function.

#GPIO - General Purpose Input/Output Pin Control	
	<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** or **4**, the output 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>** and **<save>.**
Example	AT#GPIO=3,0,1 OK AT#GPIO=3,1 OK AT#GPIO=3,2 #GPIO: 1,1 OK AT#GPIO=4,3,0 OK AT#GPIO=4,2 #GPIO: 0,1,3 OK

5.6.1.14. Temperature Monitor - #TEMPSENS

#TEMPSENS – Temperature monitor	
AT#TEMPSENS= **<mod>[,<interval>** **[,<action>** **,<low_temp>** **,<high_temp>** **[,<gpio>]]]**	Set command sets the operation of the module temperature monitor. Parameters: **<mod>** 0 – disables the periodic reporting (factory default) 1 – enables the periodic reporting 2 – instantaneous reporting of the module temperature Note: the module cannot enter sleep when **<mod>**=1. **<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 **<action>** 1 - (01) - it enables the presentation of the temperature monitor URC periodically. Default value if **<action>** is not specified. 2 - (10) - it enables the presentation of the temperature notification URC, whenever the module internal temperature reaches either **<low_temp>** or **<high_temp>** levels. 4 - (100) - Output pin **<gpio>** is tied HIGH when set temperature bounds are reached; when the temperature is back to normal the output pin **<gpio>** is tied LOW. It is mandatory to set the **<gpio>** parameter too to set this **<action>**. the notification message is in the format: **#TEMPNOTI: <level>,<value>** where: **<level>** - threshold level

#TEMPSENS – Temperature monitor	
	-1 - module temperature is under **<low_temp>** 0 - normal temperature 1 – module temperature is upper **<high_temp>** Note: Possible values for the parameter **<action>** are from 1 to 7 (001, 010, 011, 100, 101, 110 and 111) **<low_temp> -** temperature lower bound (-40 ~ 0, Celsius Degrees) **<high_temp> -** temperature upper bound (0 ~ 100, Celsius Degrees) **<gpio>** - GPIO number. Use **AT#TEMPSENS=?** test command to know available range. This parameter is required only if **<action>=4, 5, 6** or **7**.
AT#TEMPSENS?	Read command reports the current parameter settings in the format: **#TEMPSENS**: **<mod>,<interval>[,<action>,<low_temp>,<high_temp>,[<gpio>]]**
AT#TEMPSENS=?	Test command reports supported range of values for parameters **<mod>,<interval>,<action>,<low_temp>,<high_temp>** and **<gpio>**.
Example	AT#TEMPSENS=2 #TEMPSENS: TSENS2,29 #TEMPSENS: PA_THERM0,30 #TEMPSENS: PA_THERM1,30 OK

5.6.1.15. Battery and Charger Status - #CBC

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

#CBC- Battery and Charger Status	
	0 - charger not connected 1 - charger connected and charging 2 - charger connected and charge completed **<BatteryVoltage>** - battery voltage in millivolt: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage. NOTE: '1' and '2' at <ChargerState> is not supported.
AT#CBC=?	Test command returns the **OK** result code.

5.6.1.16. Select Band - #BND

#BND – Select Band	
AT#BND= <GSM band> [,<UMTS band> [,<LTE band>[,<LTE band ext>]]]	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) 17 - 2100MHz (FDD I) + 1900MHz (FDD II) + 900MHz (FDD VIII) 18 - 2100MHz (FDD I) + 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) + 900MHz (FDD VIII) + JAPAN1800(FDD IX) + JAPAN800(FDD XIX) (default value depending on product) 19 - 2100MHz (FDD I) + 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) + JAPAN850MHz (FDD VI)+ 900MHz (FDD VIII) + JAPAN1800(FDD IX) + JAPAN800(FDD XIX) (default value depending on product) <**LTE band**>: 0 disable 1 B1 2 B2 4 B3 8 B4 10 B5 40 B7 80 B8 800 B12 1000 B13 2000 B14 10000 B17 20000 B18 40000 B19 80000 B20 1000000 B25 2000000 B26 8000000 B28 10000000 B29 20000000 B30 80000000 B32 2000000000 B38 4000000000 B39 8000000000 B40 10000000000 B41 20000000000 B42 40000000000 B43

200000000000 B46
800000000000 B48

A7E0BB0F38DF
B1+B2+B3+B4+B5+B7+B8+B12+B13+B14+B17+B18+B19+B20+B25+B26+B28+B29+B30+B32+B38+B39+B40+B41+B42+B43+B46+B48 (default value depending on product)

<**LTE band ext**>:

0 disable
2 B66
40 B71

Note: This setting is maintained even after power off. **<GSM band>**, **<UMTS band>** parameters are decimal value. **<LTE band>** and **<LTE band ext>** parameters are hex format value and band set should be entered in HEX format without "0x".

Note: The **<LTE band>** and **<LTE band ext>** cannot be 0(disable) at the same time.

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>** and **<LTE band ext>**:
please refer to test command to find the supported range of values.

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.

LM960	LTE	WCDMA	GSM
Generic	1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,38,39,40,41,42,43,4648,66,71	1,2,4,5,8,9,19	Not support

	<table><tr><td>AT&T</td><td>2,4,5,12,14,29,30,46,66</td><td>2,5</td><td>Not support</td></tr><tr><td>Verizon</td><td>2,4,5,13,48,66</td><td>1,2,4,5,8</td><td>Not support</td></tr><tr><td>Sprint</td><td>2,4,5,7,12,13,25,26,41</td><td>Not support</td><td>Not support</td></tr></table> <table><tr><td>LM960A18</td><td>LTE</td><td>WCDMA</td><td>GSM</td></tr><tr><td>Generic</td><td>1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,38,39,40,41,42,43,4648,66,71</td><td>1,2,4,5,8,9,19</td><td>Not support</td></tr><tr><td>AT&T</td><td>2,4,5,7,12,13,14,25,26,29,30,41,46,48,66,71</td><td>1,2,4,5,8</td><td>Not support</td></tr><tr><td>Verizon</td><td>2,4,5,13,48,66</td><td>1,2,4,5,8</td><td>Not support</td></tr><tr><td>TMUS</td><td>2,4,5,7,12,13,14,25,26,29,30,41,46,48,66,71</td><td>1,2,4,5,8</td><td>Not support</td></tr><tr><td>Docomo</td><td>1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,38,39,40,41,42,43,4648,66,71</td><td>1,2,4,5,8,9,19</td><td>Not support</td></tr></table> <table><tr><td>LM960A9-P</td><td>LTE</td><td>WCDMA</td><td>GSM</td></tr><tr><td>CBRS</td><td>42,43,48</td><td>Not support</td><td>Not support</td></tr></table> Note: **<LTE band ext>** is only valid for Generic. If **<LTE band ext>** is used on another variant, an ERROR will be returned.
AT#BND?	Read command returns the current selected band in the format: **#BND: <GSM band>, < UMTS band>,<LTE band>,<LTE band ext>** Note: **<LTE band ext>** is only valid for Generic.
AT#BND=?	Test command returns the supported range of values of parameters **<GSM band>**,**< UMTS band>,<LTE band>** and **<LTE band ext>**. LTE bands shown as maximal bit mask for model in HEX. Example: <LM960> AT#BND=? #BND: (0),(4),(20003000281A),(42)

	OK -> 20003000281A LTE bit mask means all combinations of next bands could be accepted by SET command: 0 disable 2 B2 8 B4 10 B5 800 B12 2000 B14 10000000 B29 20000000 B30 200000000000 B46 -> 42 LTE EXT bit mask means all combinations of next bands could be accepted by SET command: 0 disable 2 B66 40 B71 <LM960A18> AT#BND=? #BND: (0),(0-11),(A1003300385A),(42) OK -> A1003301385A LTE bit mask means all combinations of next bands could be accepted by SET command: 0 disable 2 B2 8 B4 10 B5 40 B7 800 B12 1000 B13 2000 B14 10000 B17 1000000 B25 2000000 B26 10000000 B29 20000000 B30 10000000000 B41 200000000000 B46 800000000000 B48 -> 42 LTE EXT bit mask means all combinations of next bands could be accepted by SET command: 0 disable 2 B66 40 B71

	<LM960A9-P> AT#BND=? #BND: (0),(0),(860000000000),(0) OK -> 860000000000 LTE bit mask means all combinations of next bands could be accepted by SET command: 20000000000 B42 40000000000 B43 800000000000 B48 Note: **<LTE band ext>** is only valid for Generic.
Example	<LM960> AT#BND? #BND: 0,18,A7E0BB0F38DF,42 (for Generic) OK <LM960A18> AT#BND? #BND: 0,18,A7E0BB0F38DF,42 (for Generic) OK <LM960A9-P> AT#BND? #BND: 0,0,860000000000,0 (for CBRS) OK

5.6.1.17. 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 LM960 family 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>**

5.6.1.18. 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

5.6.1.19. 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 - enables the only RX0 antenna. (Only use Rx0) 1 - enables the ALL LTE RX.(Factory default) 2 - enables the only RX1 antenna. (only use Rx1) 3 - enables the only RX2 antenna. (only use Rx2) 4 - enables the only RX3 antenna. (only use Rx3) Note: Rx0 (Main Antenna is PRI0 or PRI1), Rx1 (Diversity Antenna is DIV0 or DIV1) Rx2, Rx3 (LTE band 2,4,25,41,66 support) Note: The value set by command operate both real time and power cycle. Note: For switch back all enable rx path, modem should reboot. Note: This command only have to use for the purpose of test. Note:

	LRXDIV = 0	LRXDIV = 1	LRXDIV = 2	LRXDIV = 3	LRXDIV = 4

	<table><tr><td>Rx0</td><td>Enable</td><td>Enable</td><td>Disable</td><td>Disable</td><td>Disable</td></tr><tr><td>Rx1</td><td>Disable</td><td>Enable</td><td>Enable</td><td>Disable</td><td>Disable</td></tr><tr><td>Rx2</td><td>Disable</td><td>Enable</td><td>Disable</td><td>Enable</td><td>Disable</td></tr><tr><td>Rx3</td><td>Disable</td><td>Enable</td><td>Disable</td><td>Disable</td><td>Enable</td></tr><tr><td>TX</td><td>Enable</td><td>Enable</td><td>Enable</td><td>Enable</td><td>Enable</td></tr></table> #LRXDIV = 0: Use Rx0 for TX and only RX0 enables for RX. #LRXDIV = 1: Use Rx0 for TX and all Rx paths enable for RX. #LRXDIV = 2: Use Rx0 for only TX and only RX1 enables for RX. #LRXDIV = 3: Use Rx0 for only TX and only RX2 enables for RX. #LRXDIV = 4: Use Rx0 for only TX and only RX3 enables for RX. Note: Antenna of PRI1 and DIV1 using the LTE B7, 30, 32, 38, 40, 41, 42, 43, 46, 48. Note: 4 RX support band: LTE B2, 4, 25, 41, 66 Note: Refer to below Example sequence.
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>.**
Example	.For real time operation: AT#LRXDIV? #LRXDIV: 1 (RX0, RX1, RX2 and RX3 enable) AT#LRXDIV=0 (RX0 enable only) AT#LRXDIV=2 (RX1 enable only) AT#LRXDIV=3 (RX2 enable only) AT#LRXDIV=4 (RX3 enable only) AT#LRXDIV=1 (Set to RX0, RX1, RX2 and RX3 enable) AT#REBOOT (for RX0, RX1, RX2 and RX3 enable) .After rebooting, operation AT#LRXDIV? #LRXDIV: 1 (RX0, RX1, RX2 and RX3 enable)

5.6.1.20. Configure Fast Power Down - #FASTSHDN

#FASTSHDN – Configure fast power down	
AT#FASTSHDN=<mode>[,<pin>[,<trigger>]]	Set command configure fast power down. Module enters power off autonomously if fast power down is enabled and GPIO event triggered after modem boot done. All configuration values are stored on module and applied on next power cycle. Parameter: **<mode>** - enable/disable fast power down. 0 – disable (factory default) 1 – enable on GPIO event **<pin>** - GPIO number used for fast power down event monitoring. Use **AT#FASTSHDN=?** test command to know available range. This parameter is used when **<mode>** is 1. **<trigger>** - GPIO trigger used for event 0 – activate fast power down when GPIO translates from high to low (factory default) 1 – activate fast power down when GPIO translates from low to high 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. Note: Recommend do not use **<pin>**=3 because this pin is not wakeup GPIO.
AT#FASTSHDN	Execution command for perform immediately fast power down regardless to the GPIO status or enabled status.
AT#FASTSHDN?	Read command returns the saved value in the format: **#FASTSHDN: <mode>,<pin>[,<trigger>]**
AT#FASTSHDN=?	Test command returns the range for the parameters **<mode>**, **<pin>** and **<trigger>**.
Example	AT#FASTSHDN=1,3 OK AT#FASTSHDN? #FASTSHDN: 1,3 OK

#FASTSHDN – Configure fast power down	
	AT#FASTSHDN=1,3,1 OK AT#FASTSHDN? #FASTSHDN=1,3,1 OK AT#FASTSHDN OK

5.6.1.21. 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. (default) 2 – Reject the voice call with cause code 88. 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.

5.6.1.22. 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 If NV item is an array format, NV item number must be passed in the following format : <item_num>_<array_index>.

#NVIM – Non-Volatile memory Item Management	
	<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,
	OK

5.6.1.23. 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). • "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

#TESTMODE – Enable Test Mode command in not signalling mode

8	21450 ~ 21799	21625
12	23010 ~ 23179	23095
13	23180 ~ 23279	23230
14	23280 ~ 23379	23790
17	23730 ~ 23849	23790
18	23850 ~ 23999	5925
19	24000 ~ 24149	6075
20	24150 ~ 24449	24300
25	26040 ~ 26689	26365
26	26690 ~ 27039	26865
28	27210 ~ 27659	27435
29(Rx only)	9660 ~ 9769	9715
30	27660 ~ 27759	27710
32(Rx only)	9920 ~ 10359	10140
38	37750 ~ 38249	38000
39	38250 ~ 38649	38450
40	38650 ~ 39649	39150
41	39650 ~ 41589	40620
42	41590 ~ 43589	42590
43	43590 ~ 45589	46090
46(Rx only)	46790 ~ 54539	50665
48	55240 ~ 59089	55990
66	131972~132671	132322
71	133122~133471	133297

- “LTXWAVEFORM” sets the WAVEFORM transmission.
- “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

#TESTMODE – Enable Test Mode command in not signalling mode

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

MODEL	BAND	TXGAIN _IDX	TX Power
LM960 family	1	39	23dBm
	2	39	
	3	39	
	4	39	
	5	39	
	7	51	
	8	38	
	12	38	
	13	39	
	14	44	
	17	37	
	18	39	
	19	39	
	20	40	
	25	39	
	26	38	
	28	40	
	29	NA (Rx only)	
	30	53	
	32	NA (Rx only)	
	38	49	
	39	49	
	40	53	
	41	49	
	42	49	

43	49	
46	NA (Rx only)	
48	50	
66	39	
71	41	

- "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:

- "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
9	8762 ~ 8912	8837
19	312 ~ 363	338

- "WTXWAVEFORM" □ sets the WAVEFORM transmission.
- "WPASET" □ sets the PA high gain.

#TESTMODE – Enable Test Mode command in not signalling mode

- "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
LM960 family	1	49	23dBm
	2	50	
	4	50	
	5	46	
	8	48	
	9	50	
	19	46	

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

- "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: 3G Support band – WCDMA 1,2,4,5,8,9,19.

Note 3: 4G Support band – LTE 1,2,3,4,5,7,8,12,13,14,17,18 ,19,20,25,26,28,29,30,32,38,39,40,41,42,46,48,66,71.

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.

#TESTMODE – Enable Test Mode command in not signalling mode	
	Note 8: In case of “RL3G” command, we only guarantee readable RX -60dBm , because chipset has limitation. Note 9: In case of “PRXRL4G” and “DRXRL4G” command, we only guarantee readable RX -60dBm , 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 38~53 for 23dbm and some deviation for each module. Note 15 : TXPDM range is around 48~51 for 23dbm and some deviation for each module. Note 16 : PRXRL4G, DRXRL4G and RL3G have a difference +/- 5dbm based on input RX power. Note 17: Customer should consider the UL EARFCN settings base on the BW 10Mhz.(Refer to the 3GPP TS 36.508) Note 18: Antenna of PRI1 and DIV1 using the LTE B7,30,32,38,40,41,42,43,46,48. **GNSS commands:** • “GNSS” □ Start GNSS RF receive path test.
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:	**If it is possible, customer had better to use the call box (CMW500).**

#TESTMODE – Enable Test Mode command in not signalling mode	
	<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 = 39 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" - AT#TESTMODE="LTXWAVEFORM" - AT#TESTMODE="LPASET" - AT#TESTMODE="LPABIASSET" - AT#TESTMODE="LTXGAIN 39" - 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 = -60dBm** **CW is sent (RF on, MOD off)** **Offset = depends on a cable loss** **LTE band3 and set EARFCN = 19575,**

#TESTMODE – Enable Test Mode command in not signalling mode	
	- AT#TESTMODE="TM" - AT#TESTMODE="SETLTEBAND 3" - AT#TESTMODE="LTXBW" - AT#TESTMODE="LRXBW" - AT#TESTMODE="CH 19575" - AT#TESTMODE="LNA4G" - AT#TESTMODE="PRXRL4G" – for check primary antenna path. PRXRL4G: -60 -> Return the 4G RX Level of primary antenna path - AT#TESTMODE="DRXRL4G" – for check secondary antenna path. DRXRL4G: -60 -> Return the 4G RX Level of secondary antenna path - AT#TESTMODE="ESC" - AT#TESTMODE="OM" - AT#REBOOT **<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 = 49 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 49"

#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 = -60dBm** **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: -60 - AT#TESTMODE=”ESC” - AT#TESTMODE=”OM” - AT#REBOOT **< GNSS >** **1.Recommend GNSS test sequence is below :** **Use either the dedicated GNSS connector or the shared Diversity/GNSS connector.** **To test the GNSS receive path**: **CW Signal generator setup:** **Frequency=1575.52 MHz (1575.42 MHz + 100KHz offset)** **CW Level= -110dBm** **Test the signal C/No level at the GNSS receiver:** - AT#TESTMODE="TM" - AT#TESTMODE="GNSS" - Repeat AT#TESTMODE="GNSS" five to ten times to ensure the measurements are repeatable and stable. - AT#TESTMODE="OM" Note: The response to AT#TESTMODE="GNSS" for a good connection should show C/No within 60dB +/- 5dB and Freq (frequency offset) within 100000 Hz +/- 3150 Hz.

#TESTMODE – Enable Test Mode command in not signalling mode	

5.6.1.24. 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:

#MONI – Cell Monitor	
	(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: 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> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr> **(LTE)** (E-UTRAN intra-frequency and inter-frequency cells) #MONI: RSRP:<rsrp> RSRQ:<rsrq> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm where: <netname> - name of network operator <cc> - country code <nc> - network operator code <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

#MONI – Cell Monitor	
	<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>EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> DRX:<drx> SCR:<scr> b) the other rows report a set of information for all detected neighbour cells: #MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr> See above for parameters description. When the last setting done is AT#MONI=7, then the Read command indicates the above information for each of the cells in the neighbour of the serving cell, formatting them in a sequence of <CR><LF>-terminated strings.
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.

5.6.1.25. Channel Quality Indication - #CQI

#CQI – Channel Quality Indication	
AT#CQI	Execution command indicates channel quality indication in the form:

	#CQI: <cqi> where: In WCDMA 0 – 30 In LTE 0 – 15 31 – Unknown or not detectable Note: Values are valid only if the module is registered on a WCDMA network with HSPA or LTE network is established. There will be no CQI if WCDMA or LTE is not established.
AT#CQI=?	Test command returns the supported range of values of the parameters <cqi>.

5.6.1.26. 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
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

#RFSTS – Read current network status

TXPWR	1	Tx Power (In traffic only)
DRX	640	Discontinuous reception cycle L ength(cycle length : display usin g ms)
MM	19	Mobility Management
RRC	0	Radio Resource Control
NOM	1	Network Operator Mode
BLER	005	Block Error Rate(005 means 0. 5 %)
CID	2825220	Cell ID(Hexadecimal character format).
IMSI	"450050203619261"	International Mobile Station ID
NetNameAsc	"SKTelecom"	Operation Name, Quoted string type
SD	3	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 : CS+PS)
nAST	3	Number of Active Set(Maximum 6)
nUARFCN		UARFCN of n th active set
nPSC		PSC of n th active set
nEc/Io		Ec/Io of n th active Set

(LTE Network)
#RFSTS:
<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

#RFSTS – Read current network status

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	“262011242110776”	International Mobile Station ID
NetNameAsc	" Telekom.de "	Operation Name, Quoted string type or “” if network name is unknown
SD	3	Service Domain (0: No Service, 1: CS only, 2: PS only, 3: CS+PS)
ABND	20	Active Band (1..63) 3GPP TS 36.101

Note: 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)
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

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

5.6.1.27. 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 <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.

5.6.1.28. 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) 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

#NITZ – Network Timezone	
	ss - second **zz** - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory, range is -47..+48) **d** – Number of hours added to the local TZ because of Daylight Saving Time (summertime) adjustment: range is 0-2. Note: If the DST information isn't sent by the network, then the **<datetime>** parameter has the format **"yy/MM/dd,hh:mm:ss±zz"**
AT#NITZ?	Read command reports whether (a) automatic date/time updating, (b) Full Network Name applying, (c) **#NITZ** URC (as well as its format) are currently enabled or not, in the format: **#NITZ: <val>,<mode>**
AT#NITZ=?	Test command returns supported values of parameters **<val>** and **<mode>**.

5.6.1.29. 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.

Dec	De-emphasis(dB)
0	0.0
1	-0.2
2	-0.4
3	-0.6
4	-0.9
5	-1.1
6	-1.3
7	-1.6
8	-1.8

#USB3TUNE – Tune USB 3.0 PHY

9	-2.1
10	-2.3
11	-2.6
12 (default)	-2.9
13	-3.2
14	-3.5
15	-3.8
16	-4.1
17	-4.4
18	-4.8
19	-5.1
20	-5.5
21	-5.9
22	-6.3
23	-6.7
24	-7.2
25	-7.7
26	-8.2
27	-8.7
28	-9.3
29	-9.9
30	-10.5
31	-11.3

<drv>:

Description: Select Tx drive level.

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

Dec	Vp-p1 (mV)	% of Vcca

#USB3TUNE – Tune USB 3.0 PHY			
	0	218.8	25
	1	239.9	27
	2	261.1	30
	3	282.3	32
	4	303.4	35
	5	324.6	37
	6	345.8	40
	7	366.9	42
	8	388.1	44
	9	409.3	47
	10	430.4	49
	11	451.6	52
	12	472.8	54
	13	494.0	56
	14	515.1	59
	15	536.3	61
	16	557.5	64
	17	578.6	66
	18	599.8	69
	19	621.0	71
	20	642.1	73
	21	663.3	76
	22	684.5	78
	23	705.6	81
	24	726.8	83
	25	748.0	85
	26	769.2	88
	27	790.3	90

#USB3TUNE – Tune USB 3.0 PHY	
	28 | 811.5 | 93 29 | 832.7 | 95 30 | 853.8 | 98 31(default) | 875.0 | 100 This tune data is going to be applied after target reboot. Note: The setting is maintained for both firmware updates and firmware switches.
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),(0-31)**
Reference	

5.6.1.30. 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>** **<mode>** - current mode 0 – 8 0: GENERIC 1: ATT 2: VZW 3: EU 4: SPRINT 5: TMUS 6: reserved 7: reserved 8: CBRS

#LCFC – LTE Carrier Aggregation Frequencies and Combinations	
	<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 14(700ps): Band 14 17(700b): Band 17 18(800): Band 18 19(800): Band 19 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 42(TD3500): Band 42 43(TD3700): Band 43 46(TD Unlicensed): Band 46 48(TD3600): Band 48 66(1700): Band 66 71(600): Band 71 **<combo>** - Supported combinations Note: Supported CA combination is referred to Appendix 7.1. Note: [] means support 4x4 MIMO. For example, 2A-5A-[66A] means support combination Band 2, Band 5 and Band 66 and Band 66 supports 4x4 MIMO. Note: UL_ means supported uplink CA combination.
AT#LCFC=?	Test command returns the OK result code.

5.6.1.31. 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

5.6.1.32. 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>**

5.6.1.33. Switch USB configuration - #USBSWITCH

#USBSWITCH – Switch USB configuration between Super-speed(3.0) and High-speed(2.0) mode	
AT#USBSWITCH=	Set command switches USB configuration between Super-speed(3.0) and

#USBSWITCH – Switch USB configuration between Super-speed(3.0) and High-speed(2.0) mode	
<mode>	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>**

5.6.1.34. 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 CNV <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 > Note: CNV is optional information. 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>, <auto_simdet_mode>**

#GETFW – Get firmware status	
	Parameters: **<carrier name>**: Actived modem carrier name string **<auto_simdet_mode>**: Carrier firmware selection mode by SIM 0: Disabled automatic firmware selection mode by SIM 1: Automatic firmware selection mode by SIM 2: One shot automatic firmware selected by SIM 3: One shot automatic firmware selection waiting by SIM
AT#GETFW=?	Test command returns OK

5.6.1.35. 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 returns 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 decimal number of auto firmware detection mode by SIM 0: one shot: carrier firmware is loaded based on currently inserted SIM 1: automatically at reboot, or in case of hot swap enabled, when new SIM is inserted – switch only occurs if SIM is not matched to the currently running firmware 2: disable automatic mode 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

#ACTIVEFW – Active firmware	
	<option> is string value of version name to active EX> “32.00.010” **Note**: The SMS/Phonebook user data and SIM dependent information will remain regardless the carrier firmware switch. (SIM dependent information: <number> of +CSVM. etc) **Note**: NVM items are applied to the default value corresponding to the carrier after the firmware switch **Note**: Firmware switch **<op_mode>1-3** operation should be discarded until automatic sim detection mode**(#ACTIVEFW=0,2**) is disabled.
AT#ACTIVEFW?	Read command returns information of the activated modem carrier firmware
AT#ACTIVEFW=?	Test command returns OK

5.6.1.36. Extended get firmware status - #GETFWEXT

#GETFWEXT – Extended get firmware status	
AT#GETFWEXT	Execution command return all modem carrier firmware information in the following format HOST FIRMWARE : <Host Version> SLOT STATUS CARRIER VERSION TMCFG CNV LOC <modem carrier firmware 1 > <modem carrier firmware 2 > … <modem carrier firmware N > Note: CNV is optional information. Note: MODEM CONFIG is optional information. This information field will be shown only if it supported. Note: LOC is information of loaded firmware index.
AT#GETFWEXT?	Read command returns information of the activated modem carrier firmware **#GETFWEXT: <carrier name>, <auto_simdet_mode>** Parameters: **<carrier name>**: Activated modem carrier name string **<auto_simdet_mode>**: Carrier firmware selection mode by SIM 0: Disabled automatic firmware selection mode by SIM 1: Automatic firmware selection mode by SIM 2: One shot automatic firmware selected by SIM 3: One shot automatic firmware selection waiting by SIM
AT#GETFWEXT=?	Test command returns OK

5.6.1.37. Extended active firmware - #ACTIVEFWEXT

#ACTIVEFWEXT – Extended active firmware	
AT#ACTIVEFWEXT=<op_mode>,<option>	Set command active the selected modem carrier firmware at extended carrier list(**#GETFWEXT**). If the specified modem carrier firmware selected, it returns 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 decimal number of auto firmware detection mode by SIM 0: one shot: carrier firmware is loaded based on currently inserted SIM 1: automatically at reboot, or in case of hot swap enabled, when new SIM is inserted – switch only occurs if SIM is not matched to the currently running firmware 2: disable automatic mode 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 EX> “32.00.010” **Note**: The SMS/Phonebook user data and SIM dependent information will remain regardless the carrier firmware switch. (SIM dependent information: <number> of +CSVM. etc) **Note**: NVM items are applied to the default value corresponding to the carrier after the firmware switch **Note**: Firmware switch **<op_mode>1-3** operation should be discarded until automatic sim detection mode(**#ACTIVEFW=0,2**) is disabled.
AT#ACTIVEFWEXT?	Read command returns information of the activated modem carrier firmware

#ACTIVEFWEXT – Extended active firmware	
AT#ACTIVEFWFWEXT=?	Test command returns OK

5.6.1.38. Clear firmware - #CLEARFW

#CLEARFW – Clear firmware	
AT#CLEARFW=<op_mode>[,<option>]	Execution command clear modem carrier firmware from LM960 family 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> “32.00.010” **Note**: Slot 1 is fixed for “Generic” carrier image and cannot be erased by this command. Note: the slot id is defined in **#GETFW** execution command.
AT#CLEARFW=?	Test command returns OK

5.6.1.39. 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 returns OK result. Power-cycle (reboot) action will be performed, automatically. And a new selected modem carrier firmware loaded at boot time.

#FIRMWARE-Firmware	
	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 CNV 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: CNV is optional information. Note: MODEM CONFIG is optional information. This information field will be shown only if it supported. Note: #FIRMWARE has been replaced by AT#ACTIVEFW (refer to section 5.6.1.34)
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-Firmware	
	#FIRMWARE: (1-N)

5.6.1.40. Firmware PLMN ID list - #FWPLS

#FWPLS –firmware PLMN ID SELECTION	
AT#FWPLS=<mode>,<carrier_index>[,<mccmnc>]	Execution command read/write/remove user PLMN IDs for the purpose of use automatic firmware switch by SIM. Parameters: **<mode>**: Access mode for PLMN ID data in EFS 0: Read 1: Write 2: Delete <**carrier_index**> carrier index of EFS memory If **<mode>** is 0 0: Read all If **<mode>** is 1 0: Not use If **<mode>** is 2 0 : Delete all 1: Sprint 2: Verizon 3: AT&T 4: FirstNet 5: Telstra 6: Telstra 7: Docomo **<mccmnc>** integer If **<mode>** is 0, Do not use this parameter. If **<mode>** is 1, The **<mccmnc>** is mandatory field. If **<mode>** is 2, If the **<mccmnc>** is set, the item is deleted in selected carrier list. If the **<mccmnc>** is unset, the selected carrier list is deleted all items. Read response format : **#FWPLS: <index>, <carrier_name>** **#FWPLS: <mccmnc_1>,<access_condition>** **…** **#FWPLS: <mccmnc_2>,<access_condition>** Whare **<access_condition>** 0 : Read only (pre-defined MCC/MNC)

#FWPLS –firmware PLMN ID SELECTION	
	1 : Read/Write (user defined MCC/MNC) **Note**: If the **<auto_simdet_mode>** is enabled status, the PLMN ID list is used to compare with MCC/MNC of IMSI on SIM. If the MCC/MNC is matched with SIM ID, the firmware will be switched to the carrier of SIM automatically.
AT#FWPLS?	Read command returns information of the loaded modem carrier firmware **#FWPLS: <index_1>, <carrier_name> …<index_n>, <carrier_name>** Parameters: **<index>**: Carrier firmware index in EFS **<carrier name>**: Active modem carrier name string
AT#FWPLS=?	Test command returns OK **#FWPLS: (mi_mode-max_mode),(min carrier_index-max carrier index)**

5.6.1.41. 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> **<On 4CA>** #CAINFO :

#CAINFO – Show LTE CA Information	
	<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>,<band_class>,<rx_channel>,<dl_bw>,<pci>,<rsrp>,<rssi>,<rsrq>,<sinr>,<state>,<uplink_modulation>,<downlink_modulation> **<On 5CA>** #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>,<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 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

#CAINFO – Show LTE CA Information	
	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 BAND 250 – 162 BAND 46 – 163 BAND 71 – 166 BAND 47 – 167 BAND 48 – 168 <rx_channel>: E-UTRA absolute radio frequency channel number of the serving cell. Range: 0 to 68935. <dl_bw>: Bandwidth. Values: 0 – 1.4 MHz bandwidth 1 – 3 MHz bandwidth

#CAINFO – Show LTE CA Information	
	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 <state>: Current SCC state. 0 – INIT 1 – CONFIGURED 2 – ACTIVE <uplink_modulation> 0 – BPSK 1 – QPSK 2 – 16QAM 3 – 64QAM 4 – 256QAM

#CAINFO – Show LTE CA Information	
	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 returns 0. If it acquires the UMTS or GSM technology, this command will display "**ERROR**". **Note**: The LM960 family can support 5CA.
AT#CAINFO=?	Test command returns OK

5.6.1.42. LTE Antenna Ports Signals - #LAPS

#LAPS – LTE Antenna Ports Signals	
AT#LAPS	Execution command indicates RSRP and RSRQ signals in LTE separated antenna ports. **#LAPS: <rsrp_0>,<rsrq_0>,<rsrp_1>,<rsrq_1>[,<rsrp_2>,<rsrq_2>,<rsrp_3>,<rsrq_3>]** Where: **<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 **<rsrp_2>** Reference Signal Received Power of antenna port 2 **<rsrq_2>** Reference Signal Received Quality of antenna port 2 **<rsrp_3>** Reference Signal Received Power of antenna port 3 **<rsrq_3>** Reference Signal Received Quality of antenna port 3 **Note**: Current reference signal receive power in dBm.(-44 – -140)

#LAPS – LTE Antenna Ports Signals	
	Note: Current reference signal receive quality in dBm.(-3 – -20)
AT#LAPS?	Read command operates as execution command. **Note**: This command type need for backward compatibility.
AT#LAPS=?	Test command returns OK

5.6.1.43. 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.

5.6.1.44. Host ODIS parameters management - #HOSTODIS

#HOSTODIS – Host Odis parameters management	
AT#HOSTODIS=<Param>,<Action>[,<Value>[,<Instance>]]	The set command is intended to allow the end-user to handle the Host Odis parameters for AT&T LwM2M 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 Device Unique ID. **<Action>** - this parameter should be used to select the action to be performed on the chosen parameter: 0 is to perform a “set”; 1 is to perform a “get”

#HOSTODIS – Host Odis parameters management	
	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. **<Instance>** - instance of host details settings: 0 – instance ‘0’ (default) 1 - instance ‘1’ Note: Host Manufacturer, Host Model and Host Software application version do not change after an OTA firmware upgrade. Note: “GET” operation not allowed on Host Device Unique ID.
AT#HOSTODIS =?	Test command returns the supported range of **<Param>, <Action>, <Value>** and **<Instance>** parameters.

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,"Model #4 - 2nd version"
	
	OK
	
	//read the currently set value
	AT#HOSTODIS=1,1
	
	#HOSTODIS: 0,"Model #4 - 2nd version"
	OK
	
	//reset the Model value
	AT#HOSTODIS=1,2
	
	OK

#HOSTODIS – Host Odis parameters management	

	//read again the currently set value
	AT#HOSTODIS=1,1
	#HOSTODIS:“HMOD1”
	
	OK
	
	//test command
	AT#HOSTODIS=?
	
	#HOSTODIS: (0-3),(0-2),64,(0,1)
	
	OK

5.6.1.45. Thermal Mitigation Level - #TMLVL

#TMLVL – Thermal Mitigation Level	
AT#TMLVL=<device_id>	Set command reports a current thermal mitigation level of specific **<device_id>**. **Parameters:** **<device_id>** - which device to get mitigation level 1 – TSENS2 2 – PA_THERM The report message is in the format: **#TMLVL: <level>** Where: **<level>** - thermal mitigation level 0 – normal 1 – level1 2 – level2 3 – level3 Note: level2 is shown only with PA_THERM device.
AT#TMLVL?	Read command reports a current thermal mitigation level of all devices in the format:

#TMLVL – Thermal Mitigation Level	
	#TMLVL: TSENS2,<level> **#TMLVL: PA_THERM,<level>**
AT#TMLVL=?	Test command returns the supported range of values for parameter **<device_id>.**
Example	AT#TMLVL? #TMLVL: TSENS2,1 #TMLVL: PA_THERM,1 OK AT#TMLVL=2 #TMLVL: 1 OK

5.6.1.46. Shutdown Indication - #SHDNIND

#SHDNIND – Shutdown Indication	
AT#SHDNIND=<enable>[,<gpio>]	Set command enable/disables shutdown GPIO indicator. Shutdown GPIO indicator acts as a notification to host when the modem is finished a shutdown process and power removal is possible. Configuration is saved on the modem and will be applied after next power cycling. **Parameters:** **<enable>** - enable/disable shutdown GPIO indicator 0 – disable 1 – enable indicator when shut down (refer to #SHDN) 2 – enable indicator when fast shutdown (refer to #FASTSHDN) 3 – enable indicator when shut down and fast shutdown **<gpio>** - GPIO number will be used for indicator. Use **AT#SHDNIND=?** test command to know available range. Note: don't need to set **<gpio>** when disable indicator using **<enable>**=0.
AT#SHDNIND?	Read command reports a current configuration in the format: **#SHDNIND: <enable>,<gpio>** Note: **<gpio>** shown as '0' when shutdown indicator is disabled.

#SHDNIND – Shutdown Indication	
AT#SHDNIND=?	Test command returns the supported range of values for parameter **<enable>** and **<gpio>.**
Example	AT#SHDNIND=3,3 OK AT#SHDNIND? #SHDNIND: 3,3 OK

5.6.1.47. LTECAT

#LTECAT – LTE category Setting	
AT#LTECAT= <category>	Set command sets the specific LTE category **Parameters:** **<category>** - LTE category. 6 – LTE Category 6 9 – LTE Category 9(factory default for LM960A9-P) 12 – LTE Category 12(factory default for LM960/LM960A18) Note: <category> is saved in NVM. Note: The Category parameter means max supported UE Category. LM960/LM960A18 supports UE CAT12 which is MAX CAT18 DL+ MAX CAT13 UL. LM960A9-P supports UE CAT9 which is MAX CAT9 DL + MAX CAT5 UL.
AT#LTECAT?	Read command returns the LTECAT current setting, in the format: **#LTECAT: <category>**
AT#LTECAT=?	Test command reports the supported range of values for parameters **<category>.**

5.6.1.48. WWANLED

#WWANLED – WWLAN_LED GPIO Setting	
AT#WWANLED= <mode>,<status> [,<on_duration> [,<off_duration>]]	Set command sets the behaviour of the WWLAN_LED GPIO Parameters: **<mode>** - modem status desired WWLAN LED blink. 0 – Low power mode

#WWANLED – WWLAN_LED GPIO Setting	
	1 – Offline 2 – No service 3 – In Service, Roaming 4 – Data Active **<status>** - On/Off WWLAN LED blink pattern for selected <mode> 0 – Off 1 – On **<on_duration>** - duration of period in which WWLAN_LED signal is tied to Low for selected <mode> 0..100 - in tenth of seconds **<off_duration>** - duration of period in which WWLAN_LED signal is tied to High for selected <mode> 0..100 - in tenth of seconds **Note**: The value of **0** means “deactivate” in the **<on_duration>** and **<off_duration>**. Therefore, the value 0 can be used for this LED always on/off. **Note**: The following table shows factory default setting Low Power Mode OFF - Dark Offline OFF - Dark No Service OFF - Dark In Service OFF - Dark Data Active OFF - Dark **Roaming**: Blinking ON 5s, OFF 200ms. **Note**: The blink pattern of roaming is fixed and it cannot be modified. However, the roaming status also set to disabled as a factory default setting and it will be activated when “In Service” mode’s status is on. **Note**: Current consumption could increase depends on LED scenario.
AT#WWANLED?	Read command returns the WWLAN_LED GPIO current setting, in the format:

#WWANLED – WWLAN_LED GPIO Setting	
	[#WWANLED:<mode1>,<status1>,<on_duration1>,<off_duration1> **[<CR><LF>#WWANLED: <mode2>,<status2>,<on_duration2>,<off_duration2> […]]]**
AT#WWANLED=?	Test command reports the supported range of values for parameters **<mode>,< status>,<on_duration> and <off_duration>.**
Example	**AT#WWANLED=0,0,0,0** **OK** : Set Always Off the LED when Low Power Mode **AT#WWANLED=2,1,1,0** **OK** : Set Always On the LED when No Service Mode **AT#WWANLED=3,1,10,10** **OK** : Set Blinking the LED when In Service Mode

5.6.1.49. Fast Dormancy - #FDOR

#FDOR– Fast dormancy	
AT#FDOR= **<mode>[,<FDDelayTimer>[,<SCRITimer>]]**	This command triggers fast dormancy; if all conditions are passed successfully, SCRI will be sent towards the network. SCRI will be sent as a one shot or according to the specified delay timer expiry, depending on the mode selected. The Fast Dormancy feature is WCDMA only feature and not present in LTE. Therefore, it can be set in WCMDA online mode. Parameter: **<mode>** 1 – indicate application driven (1 shot) Fast Dormancy to modem 2 – switch ON autonomous Fast Dormancy (AFD) – default value 3 – switch OFF autonomous Fast Dormancy (AFD) <**FDDelayTimer**> (maximum timer) will be started when the network re-establishes the radio bearer due to some incoming data. After this timer expiry, Data activity will be checked. If there is data activity within this time period, no action will be taken. If there is no data activity, the signalling connection release request will be sent to network. 1..60 - integer value in seconds <**SCRITimer**>

#FDOR– Fast dormancy	
	0 - used a T323 Timer value in SIB1 1..120 - integer value in seconds Note: the setting is saved in NVM. Note: When <mode> is 2, <FDDelayTimer> timer value becomes effective and monitor user plane data at the moment of expiry. Default timer value is 6 sec. Note: The default value for <SCRITimer> is 5 seconds for user-defined timer. If the network supports the T323 timer in SIB1, the network-defined time is used for T323 timer when <SCRITimer> is set 0. Otherwise, user-defined time replaces the network-defined time. Note: the reject cause from lower layers is reported by the unsolicited indication **#FDOR: <cause>** where <cause> 6 - Reject when Network deactivated FD, by not sending timer T323 in SIB1. Note: be updated later. Note: The setting is maintained for both firmware updates and firmware switches.
AT#FDOR?	**Read command returns "OK" string along with last accepted mode and timer values, in the format:** **#FDOR: <mode>,< FDDelayTimer >,< SCRITimer>**
AT#FDOR=?	Test command reports the supported range of values.

5.6.1.50. Set APN param change - #SINGLEAPNSWITCH

#SINGLEAPNSWITCH – Set APN param change	
AT#SINGLEAPNSWITCH=<mode>	This command sets APN param change; If an APN network identifier or APN-related parameter is updated after a PDN connection using the APN has been established, the device shall release the PDN connection and then immediately re-establish the PDN connection. Parameter:

#SINGLEAPNSWITCH – Set APN param change	
	<mode> 0 – Disable 1 – Enable (default) Note: Value set by command is directly stored in NVM and available at next reboot.
AT#SINGLEAPNSWITCH?	Read command reports current configuration: **# SINGLEAPNSWITCH: <mode>**
AT#SINGLEAPNSWITCH=?	Test command reports the supported range of values. **#SINGLEAPNSWITCH: (0,1)**

5.6.1.51. Set 4RX disable - #4RXDIS

#4RXDIS – Set 4RX disable	
AT#4RXDIS=<mode>	This command enable or disable for 4RX. **#4RXDIS: <mode>** Parameter: **<mode>** 0 – 4RX enable(default) 1 – 4RX disable Note: The value set by command operate after power cycle. Note: 4RX supported band is 2,4,25,41,66.
AT# 4RXDIS?	Read command reports the currently selected **<mode>** in the format: **#4RXDIS: <mode>**
AT# 4RXDIS =?	Test command reports the supported range of values.
Reference	.AT#4RXDIS? #4RXDIS: 0 Modem support 4RX. #4RXDIS: 1 Modem don't support 4RX, only support 2RX.

5.6.1.52. Get System Up Time - #UPTIME

#UPTIME – Get System Up Time	
AT#UPTIME=<format>	This command returns elapsed time from system up according to format setting.

#UPTIME – Get System Up Time	
	#UPTIME: <format> Parameter: **<format>** 0 – sec unit 1 – time unit
AT# UPTIME =?	Test command reports the supported range of values.

5.6.1.53. Preserve APN Profile during firmware upgrade - #PERSISTAPN

#PERSISTAPN– APN Persistence	
AT#PERSISTAPN= <mode>	This command determines whether to retain the APN profile. When a firmware download event occurs, the APN profile is backed up. If the backup APN profile exists when you download the firmware, restore the APN profile. Parameter: **<mode>** 0 – initialized with the APN profile specified by the network operator – default value 1 – backup and restore the current APN profile. Note: When this feature is set to enable, the set value is retained even if the changed firmware is changed. Note: It applies not only to downloading the firmware but also when changing the active carrier with the AT#FIRMWARE command.
AT#PERSISTAPN?	**Read command returns "OK" string along with last accepted mode in the format:** **#PERSISTAPN: <mode>**
AT#PERSISTAPN =?	Test command reports the supported range of values.

5.6.1.54. Enable/disable the CLAT interface - #CLATENA

#CLATENA – Enable/disable the CLAT interface	
AT#CLATENA=<cid>,<enable>	This command is used to enable/disable the Modem CLAT(Customer-side Address Translator) functionality to support communication to IPv4 servers on IPv6 only cellular networks.

#CLATENA – Enable/disable the CLAT interface	
	Parameter: **<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 **<enable>** 0 – disable CLAT interface (default) 1 – enable CLAT interface
AT#CLATENA?	Read command returns the current settings for each defined context in the format: **#CLATENA: <cid>,<enable>**
AT#CLATENA=?	Test command returns values supported as a compound value.
Example	**AT#CLATENA**=1,1 OK **AT#CLATENA**? #CLATENA: 1,1 #CLATENA: 2,0 #CLATENA: 3,0 OK

5.6.1.55. Saving and Retrieving the Odis Parameters - +ODIS

+ODIS – Saving and Retrieving the Odis Parameters	
AT+ODIS=<hostUniqueDevId>,<hostManufacturer>,<hostModel>,<hostSwVersion>	This command allows the end-user to handle the Host Odis parameters. In case of AT&T LwM2M agent up and running, the command is executed internally to the LwM2M client, updating this client about the values change (i.e.: the server will be notified about this change if the observation on these items is active). Parameters: **<hostUniqueDevId>** - contains a string, between double quotes, with the host unique device identifier HUID0, default value

+ODIS – Saving and Retrieving the Odis Parameters	
	<hostManufacturer> - contains a string, between double quotes, with the host manufacturer identifier. HMAN0, default value **<hostModel>** - contains a string, between double quotes, with the host model identifier. HMOD0, default value **<hostSwVersion>** - contains a string, between double quotes, with the host software version identifier. HSW0, default value Note: The value set by command is directly stored in NVM. Note: The odis setting requires all the odis values to be set each time the command is issued, therefore, to change only one odis parameters it is recommended to read all the values first, and then compose the command input string accordingly. Note: Since the odis items are 4, it is quite unlikely but possible that some the storing of some of them fails. In this case, the new values, where succeeded, are kept. An advice is that, in case of storing failure, the +ODIS? command is used to verify what are the odis items changed, if any.
AT+ODIS?	Read command reports the current odis values in the format: **+ODIS: <hostManufacturer>,<hostModel>,<hostSwVersion>** Note: As per AT&T specification, the **<hostUniqueDevId>** odis parameter could be set but it cannot be read by AT commands.
AT+ODIS=?	Test command reports the supported range of values for all the parameters.

Example	//get the currently set value
	AT+ODIS?
	+ODIS: "HMAN0","HMOD0","HSW0"
	OK
	
	//set a new Host odis value
	AT+ODIS="HUID12","HMAN34","HMOD56","HSW78"

+ODIS – Saving and Retrieving the Odis Parameters	
	OK //verify the currently set value AT+ODIS? +ODIS: "HMAN34","HMOD56","HSW78" OK

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: **<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 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 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

$GPSNMUN - Unsolicited NMEA Data Configuration	
AT$GPSNMUN?	Read command returns whether the unsolicited GPS NMEA data streaming is currently enabled or not, along with the NMEA sentences availability status, in the format: **$GPSNMUN: <enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>**
AT$GPSNMUN=?	Test command returns the supported range of values for parameters **<enable>, <GGA>, <GLL>,<GSA>,<GSV>,<RMC>,<VTG>**
Example	AT$GPSNMUN=1,0,0,1,0,0,0 OK These sets the GSA as available sentence in the unsolicited message AT$GPSNMUN=0 OK Turn-off the unsolicited mode AT$GPSNMUN? $GPSNMUN: 1,0,0,1,0,0,0 OK Give the current frame selected (GSA) The unsolicited message will be: $GPGSA,A,3,23,20,24,07,13,04,02,,,,,,2.4,1.6,1.8*3C
Note	1. If the <**enable**> is 3, it can activate the NMEA Unsolicited streaming both the current dedicated port and NMEA port. 2. The current setting is stored in the profile extended section. 3. For details of NMEA output, please refer to 4.6.4. NMEA 0183 of SW User Guide document. 4. If **#LOCNMEATYPE** command is already used, the user should avoid using this command because this setting have an effect on **#LOCNMEATYPE** operation.
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 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

$GPSACP - Get Acquired Position	
	00..59 **<spkm>** - xxxx.x Speed over ground (Km/hr) (referred to VTG sentence) **<spkn>** - xxxx.x- Speed over ground (knots) (referred to VTG sentence) **<date>** - ddmmyy Date of Fix (referred to RMC sentence) where: dd - day 01..31 mm - month 01..12 yy - year 00..99 - 2000 to 2099 **<nsat>** - nn - Total number of satellites in use (referred to GGA sentence) 00..12
AT$GPSACP?	Read command has the same meaning as the Execution command
AT$GPSACP=?	Test command returns the **OK** result code
Example	AT$GPSACP $GPSACP: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”

$GPSRST - Restore To Default GPS Parameters	
	configuration and stores them in the NVM of the device.
AT$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 factory 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) 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	1. The NMEA Extended Data is displayed on NMEA port depending on **$GPSNMUN** setting. 2. The current setting is stored in the profile extended section. 3. For details of NMEA output, please refer to 4.6.4. NMEA 0183 of SW User Guide document. 4. If **#LOCNMEATYPE** command is already used, the user should avoid using this command because this setting have an effect on **#LOCNMEATYPE** operation.
Example	AT$GPSNMUNEX=1,0,0

$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration	
	OK These sets the GNGNS as available sentence in the unsolicited message AT$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: **<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$GPSNVRAM=?	Test command returns the supported range of values for parameters **<bitfield>,<action>**
Example	AT$GPSNVRAM=15,0 OK

$GPSNVRAM – GPS NVRAM Parameters Delete	
Note	The current setting if stored through **$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 LM960 family 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. Default is 990 in meters. Note: The LM960 family 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 LM960 family 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 LM960 family 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)

$GPSQOS – GPS Quality Of Service	
	1 - Current or Last known location 2 - Invalid Location, indicates that this parameter shall not be used Note: The LM960 family isn't supported about **< location_type >**. It has no effect and is included only for backward compatibility. **<nav_profile>** (navigation profile): 0 - Car navigation profile (default) 1 - Personal profile 2 - Low speed profile 3 - Invalid profile, indicates that this parameter shall not be used Note: The LM960 family isn't supported about **< nav_profile >**. It has no effect and is included only for backward compatibility. **< velocity_request>** (velocity information is needed): 0 - FALSE 1 - TRUE (default) Note: The LM960 family is always supported with TRUE about **< velocity_request>**. It has no effect and is included only for backward compatibility.
AT$GPSQOS?	Read command returns the current QoS values, in the format: AT$GPSQOS: **<horiz_accuracy>,<vertic_accuracy>,<rsp_time> ,<age_of_location_info>,<location_type>,< nav_profile>,< velocity_request>**
AT$GPSQOS=?	Returns the list of supported QoS values for each field. $GPSQOS: (0-1800000),(0-990),(0-14400),(0-1966020),(0-2),(0-3),(0,1)
Example	AT$GPSQOS=1800000,990,150,0,0,0 OK
Note	The current setting if stored through **$GPSSAV**

5.6.2.10. GPS Start Location Service Request - $GPSSLSR

$GPSSLSR – GPS Start Location Service Request	
AT$GPSSLSR = **<transport_protocol>** **[,<pos_mode>** **[,<client_id>,** **<clientid_type>**	Command used to start the Receiver in Autonomous or A-GPS mode. Parameter: **<transport_protocol>**: 0 - C-Plane 1 - SUPL

$GPSSLSR – GPS Start Location Service Request	
[,<mlc_number>, **<mlcnumber_type>** **[,<interval>** **[,<service_type_id>** **[,<pseudonym_indicator>]]]]]]]**	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 LM960 family isn't supported about MS Assisted Based. It has 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 LM960 family 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 LM960 family 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 LM960 family isn't supported about < **mlc_number >**

$GPSSLSR – GPS Start Location Service Request	
	because of not supporting the 3rd Part Location Transfer. It has no effect and is included only for backward compatibility. **<mlcnumber_type>**: 0 - MSISDN 1 - Invalid (default) Note: **<mlc_number>** and **<mlcnumber_type>** are mandatory for A-GPS mode. Note: The LM960 family isn't supported about <**mlcnumber_type >** because of not supporting the 3rd Part Location Transfer. It has no effect and is included only for backward compatibility. **<interval>**: 0 - 7200: GPS reporting period in seconds (will be sent unsolicited). Note: In the LM960 family, the GPS reporting period is not supported and the **<interval>** means times between fixes. Note: If this value is not set, it is assumed to be 0. Note: If this value is not 0, it means a tracking session. Note: The Unsolicited NMEA sentences have to be enabled with the commands **$GPSNMUN**. Note: The NMEA sentences for an 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 LM960 family isn't supported about <**service_type_id>**. It has no effect and is included only for backward compatibility. **<pseudonym_indicator>**: 0 - FALSE (default): display username at the external client 1 - TRUE: display username as anonymous at the external client Note: The LM960 family 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**"

$GPSSLSR – GPS Start Location Service Request	
	If C-plane or SUPL session is not successfully completed, then an unsolicited indication reports the error cause in the following formats: In case C-Plane errors, **$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>** 0 PDSM_PD_END_OFFLINE /* Phone Offline */ 1 PDSM_PD_END_NO_SRV /* No service */ 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 request 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

$GPSSLSR – GPS Start Location Service Request	
	/* 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 */ 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

$GPSSLSR – GPS Start Location Service Request	
	/* MO-LR Error : Unexpected data value */ 35 PDSM_PD_END_SS_MOLR_ERRORS_DATA_MISSING /* MO-LR Error : Data missing */ 36 PDSM_PD_END_SS_MOLR_ERRORS_FACILITY_NOT_SUPPORTED /* MO-LR Error : Facility not supported */ 37 PDSM_PD_END_SS_MOLR_ERRORS_SS_SUBSCRIPTION_VIOLATION /* MO-LR Error : SS subscription violation */ 38 PDSM_PD_END_SS_MOLR_ERRORS_POSITION_METHOD_FAILURE /* MO-LR Error : Position method failure */ 39 PDSM_PD_END_SS_MOLR_ERRORS_UNDEFINED /* MO-LR Error : Undefined */ 40 PDSM_PD_END_CP_CF_DISRUPT_SMLC_TO /* Control plane's smlc timeout, may or may not end pd */ 41 PDSM_PD_END_MT_GUARD_TIMER_EXPIRY /* Control plane's MT guard time expires */ 42 PDSM_PD_END_WAIT_ADDITION_ASSIST_EXPIRY /* End waiting for additional assistance */ 69 PDSM_PD_END_MO_LR_NOT_DELIVERED /* When MO LR COMPLETED message is received */
AT$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 $GPSSLSR set command. Parameter: **<abort_cause>** 0 - User denies the request 1 - Unspecified cause for abort 2 - Cause Invalid
AT$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.

$LCSSLP - Update SLP address	
	The current setting is stored in NVM.

5.6.2.13. Update terminal information - $LCSTER

$LCSTER - Update terminal information	
AT$LCSTER= **<id_type>** **[,<id_value>** **[,<pref_pos_mode>** **[,<tls_mode>]]]**	Set command updates the terminal information like IMSI, MSISDN or IPv4 address. Parameters: **<id_type>**: is a number which can have any of the following values 0 - MSIDSN 1 - IMSI (default value) 2 - IPv4 address 3 - Invalid **<id_value>**: is a string, as defined in <**id_type**> **<pref_pos_mode>**: preferred position mode, 0 - default position mode 1 - none preferred position mode **<tls_mode>**: indicates if TLS mode should/should not be used by the SET 0 - non-TLS mode 1 - TLS mode (default value)
Note	The LM960 family 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>**

$LCSLRMT – MT Location Request Mode	
	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.

$LCSLRMT – MT Location Request Mode	
	<Service_Type_id> 0 - 127 **<reqid>** Integer that identifies the request. **<reqid>** uniquely identifies the MT-LR sent by the network and the same **<reqid>** shall be returned in **$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 LM960 family, 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 LM960 family, 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_message_length>,<seq_no>,<Security_Object_Type>**	Set command is used to pass the security objects (e.g. certificate, key) to the Transport Layer Security Protocol (binary string). The certificate shall be in hexadecimal format (each octet of the certificate is given as two IRA character long hexadecimal number).

$LTC – LCS certificate	
	Parameter: **<string>** - the string certificate segment (max 300 characters per segment) **<total_message_length>** - The total size of the certificate to be received 1 - 4096 **<seq_no>** - The sequence number of the segment. 1 - 13 **<Security_Object_Type>** 0 - Root Certificate
AT$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: **$GNSSCONF: <combination>,<worldwide>** where: **<combination>** - GNSS configuration **<worldwide>** - Applicable area
AT$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: <mode>**

$GPSLOCK – GPS Lock Mode	
	where: **<mode >** - Lock Mode
AT$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>)**
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 Poisoning Protocol). Parameters: **< mode >** - Configuration for LPP. (Default see **Note 1**) 0 – RRLP in LTE 1 – LPP User Plane in LTE 2 – LPP Control Plane in LTE 3 – LPP UP/CP in LTE
AT$LCSLPP?	Read command returns the currently selected Configuration for LPP in the format:

$LCSLPP – LPP Configuration	
	$LCSLPP: <mode> where: **<mode >** - Configuration for LPP
AT$LCSLPP=?	Test command reports the supported range of values for parameter(s) **<mode>**. **$LCSLPP: (the supported range of <mode>)**
Note	1. Default is dependent according to operator requirement. - T-Mobile (TMUS): 3 - Others: 2 2. 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: **<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**)

$LCSAGLO – Selection of Positioning protocols for A-GLONASS	
	The **<mask> 4 and 8** must be set in the LPP configuration for this to take effect. (see **$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. 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.

$NMEA – Enable NMEA Stream	
AT$NMEA=?	Reports the current value of the <**n**> parameter, in the format: $NMEA: <**n**>
Note	This command is only applicable for Sprint version. This setting has an effect on **$GPSNMUN** setting and follows the storing operation 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? $GPSNMUN: 2,1,0,1,1,1,1 OK AT$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

$LOCATION – Enable Location Services	
	Parameter: **<n>**: Integer 0 – Disable Location Services 1 – Enable Location Services (**Default**)
AT$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>** 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)

$GETLOCATION – Get Current Location	
	<**bearing**> - bearing in decimal degrees (+DDD.dd) <**nsat**> - number of satellites used in location fix (nn) Note: If the location position is not to be retrieved or the location services are turned off, **ERROR** will be return.
Note	This command is only applicable for Sprint version.
Example	AT$GETLOCATION 09/24/2009,21:43:57,39.012345,-104.012345,+312,1234567,40,359.93,13 OK

5.6.2.27. GNSS Auto Start Configuration - #LOCAUTOSTART

#LOCAUTOSTART – GNSS Auto Start Configuration	
AT#LOCAUTOSTART=<function>[,<fix_type>[,<max_time>[,<max_dist>[,<fix_rate>]]]]	Set command sets the GNSS Auto Start configuration. Parameters: <**function**>: Integer, setting to indicate when modem should start an automatic 0 – Disabled 1 – AT Bootup 2 – When NMEA port is opened (**Default with OEM PRI setting**) <**fix_type**>: Integer, Type of GNSS fix 1 – Default Engine mode 2 – MS-Based 3 – MS-Assisted 4 – Standalone (**Default with OEM PRI setting**) <**max_time**>: Integer, Maximum time allowed for the receiver to get a fix in seconds 1-255 **Default with OEM PRI setting**: 255 <**max_dist**>: Integer, Maximum uncertainty of a fix measured by distance in meters. 1-4294967280 **Default with OEM PRI setting**: 1000 <**fix_rate**>: Integer, Time between fixes in seconds

#LOCAUTOSTART – GNSS Auto Start Configuration	
	1-65535 **Default with OEM PRI setting**: 1
AT#LOCAUTOSTART?	Read command returns the current GNSS Auto Start setting, in the format: **#LOCAUTOSTART: <function>,<fix_type>,<max_time>,<max_dist>,<fix_rate>** Where, <**function**>: Integer, setting to indicate when modem should start an automatic 0 – Disabled 1 – AT Bootup 2 – When NMEA port is opened 255 - not reported by modem (**Default without OEM PRI setting)** Default response without OEM PRI setting: **#LOCAUTOSTART: 255,,,,**
AT#LOCAUTOSTART=?	Test command reports the supported range of values for parameters **<function>,<fix_type>,<max_time>,<max_dist>,<fix_rate>.**
Note	1. This setting has an effect on current GNSS setting. - <**fix_type**>: **$GPSSLSR** (<transport_protocol>, <pos_mode>) - <**fix_rate**>: **$GPSSLSR**(<interval>) - **<max_time**>: **$GPSQOS**(<rsp_time>) - <**max_dist**>: **$GPSQOS**(<horiz_accuracy>) 2. The current setting is stored in NVM. 3. The **Defaults or parameters** are values after applying OEM PRI setting.
Reference	80568ST10908A_LM960_QMI_Command_Reference_Guide.docx - QMI_GMS_LOC_GET_AUTO_START - QMI_GMS_LOC_SET_AUTO_START

5.6.2.28. NMEA Type Configuration - #LOCNMEATYPE

#LOCNMEATYPE – NMEA Type Configuration	
AT#LOCNMEATYPE= **<nmea_mode_ind>[,<nmea_type>]**	Set command sets the NMEA Type Configuration. Parameters: <**nmea_mode_ind**>: Integer - Execute the Location Fix start or stop.

#LOCNMEATYPE – NMEA Type Configuration	
	- Indicate whether NMEA port is opened or not 0 – NMEA Streaming stop 1 – NMEA Streaming start <**nmea_type**>: Integer - Set NMEA type mask to modem 0 – Disable NMEA type 1 – 134020607 **Default with OEM PRI setting**: 134020607 **Default without OEM PRI setting:** 0 - Enable GPGGA type: 0x00000001 - Enable GPRMC type: 0x00000002 - Enable GPGSV type: 0x00000004 - Enable GPGSA type: 0x00000008 - Enable GPVTG type: 0x00000010 - Enable GPGLL type: 0x00000020 - Enable GLGSV type: 0x00000040 - Enable GNGSA type: 0x00000080 - Enable GNGNS type: 0x00000100 - Enable GARMC type: 0x00000400 - Enable GAGSV type: 0x00000800 - Enable GAGSA type: 0x00001000 - Enable GAVTG type: 0x00002000 - Enable GAGGA type: 0x00004000 - Enable BDGSV type: 0x00008000 - Enable GPGNS type: 0x00040000 - Enable GLGNS type: 0x00080000 - Enable GNGSV type: 0x00100000 - Enable GAGNS type: 0x00200000 - Enable BDGSA type: 0x00400000 - Enable BDRMC type: 0x00800000 - Enable BDVTG type: 0x01000000 - Enable BDGGA type: 0x02000000 - Enable BDGNS type: 0x04000000

#LOCNMEATYPE – NMEA Type Configuration	
AT#LOCNMEATYPE?	Read command returns the current NMEA Type configuration, in the format: **#LOCNMEATYPE: <nmea_type>**
AT#LOCNMEATYPE=?	Test command reports the supported range of values for parameters **<nmea_mode_ind>,<nmea_type>.**
Note	1. For <**nmea_mode_ind**> value, each value means the following description, - NMEA streaming start: GPS engine start location fix and start to stream out NMEA sentences. - NMEA streaming stop: GPS engine stop location fix and stop NMEA streaming 2. The current setting **<nmea_type>** is stored in NVM. 3. The **Default** of **<nmea_type>** is value after applying OEM PRI setting. 4. If **$GPSNMUN** or **$GPSNMUNEX** command is already used, the user should avoid using this command because this setting have an effect on **$GPSNMUN** and **$GPSNMUNEX** operation.
Reference	80568ST10908A_LM960_QMI_Command_Reference_Guide.docx - QMI_GMS_LOC_SET_NMEA_TYPE

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 1 – 3GPP2 format (factory default for Verizon) Note: The input format for 3GPP2 SMS is according to Telit syntax: see 5.5.5 NOTE: the setting is saved in NVM.
AT#SMSFORMAT?	Read command reports the current setting of parameter <**mode**>, in the format: **#SMSFORMAT: <mode>** (**<mode>** described above)

#SMSFORMAT – Select 3GPP or 3GPP2 Format for MO SMS	
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. 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**)

#STIA - SIM Toolkit Interface Activation	
	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: • 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:

#STIA - SIM Toolkit Interface Activation	
	if ***<cmdType>=1*** *(REFRESH)* an unsolicited notification will be sent to the user: **#STN: <cmdType>,<refresh type>** where: **<refresh type>** 0 - SIM Initialization and Full File Change Notification; 1 - File Change Notification; 2 - SIM Initialization and File Change Notification; 3 - SIM Initialization; 4 - SIM Reset In this case neither **#STGI** nor **#STSR** commands are required: • **AT#STGI** is accepted anyway. • **AT#STSR=<cmdType>,0** will answer **OK** but do nothing. *if* ***<cmdType>=17*** *(SEND SS)* *if* ***<cmdType>=19*** *(SEND SHORT MESSAGE)* *if* ***<cmdType>=20*** *(SEND DTMF)* *if* ***<cmdType>=32*** *(PLAY TONE)* an unsolicited notification will be sent if allowed by SIM (see GSM 11.14): **#STN: <cmdType>[,<text>]** where: **<text>** - (optional) text to be displayed to user In these cases neither **#STGI** nor **#STSR** commands are required: • **AT#STGI** is accepted anyway.

#STIA - SIM Toolkit Interface Activation	
	• **AT#STSR=<cmdType>,0** will answer **OK** but do nothing. In case of SEND SHORT MESSAGE (**<cmdType>**=19) command if sending to network fails an unsolicited notification will be sent **#STN: 119** *if* ***<cmdType>=33*** *(DISPLAY TEXT)* an unsolicited notification will be sent if allowed by SIM (see GSM 11.14): **#STN: <cmdType>[,<cmdDetails>[,<text>]** where: **<cmdDetails>** - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - normal priority 1 - high priority **bits 2 to 7**: reserved for future use **bit 8**: 0 - clear message after a delay 1 - wait for user to clear message **<text>** - (optional) text to be displayed to user In this case: 1. if **<cmdDetails>/bit8** is **0** neither **#STGI** nor **#STSR** commands are required: • **AT#STGI** is accepted anyway. • **AT#STSR=<cmdType>,0** will answer **OK** but do nothing. 2. If **<cmdDetails>/bit8** is 1 **#STSR** command is required *if* ***<cmdType>=40*** *(SET UP IDLE MODE TEXT)* an unsolicited notification will be sent:

#STIA - SIM Toolkit Interface Activation	
	#STN: <cmdType>[,<text>] where: **<text>** - (optional)text to be displayed to user In these cases neither **#STGI** nor **#STSR** commands are required: • **AT#STGI** is accepted anyway. • **AT#STSR=<cmdType>,0** will answer **OK** but do nothing. *if* ***<cmdType>=18*** *(SEND USSD)* an unsolicited notification will be sent to the user: **#STN: <cmdType>[,<text>]** where: **<text>** - optional text string sent by SIM In this case: • **AT#STSR=18,20** can be sent to end USSD transaction. • **AT#STGI** is accepted anyway. • **AT#STSR=<cmdType>,0** will answer **OK** but do nothing. *if* ***<cmdType>=5*** *(SET UP EVENT LIST)* an unsolicited notification will be sent: **#STN: <cmdType>[,<event list mask>]** where: **<event list mask>** - (optional)hexadecimal number representing the list of events to monitor (see GSM 11.14) - '00' = MT call

#STIA - SIM Toolkit Interface Activation	
	- '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: **#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:

#STIA - SIM Toolkit Interface Activation	
	#STN: <cmdType> Note: if the **call control** or **SMS control facility in the SIM** is activated, when the customer application makes an outgoing call, or sends an SS or USSD, or an SMS, the following **#STN** unsolicited indication could be sent, according to GSM 11.14, to indicate whether the outgoing call has been accepted, rejected or modified by the SIM, or if the SMS service centre address or destination has been changed: **#STN: <cmdTerminateValue>,<Result>[,<TextInfo>[,<Number>[,<MODestAddr>]]]** where **<cmdTerminateValue>** 150 - SMS control response 160 - call/SS/USSD response **<Result>** 0 - Call/SMS not allowed 1 - Call/SMS allowed 2 - Call/SMS allowed with modification **<Number>** - Called number, Service Center Address or SS String in ASCII format. **<MODestAddr>** - MO destination address in ASCII format. **<TextInfo>** - alpha identifier provided by the SIM in ASCII format. Note: an unsolicited result code **#STN: 254** is sent if the user has indicated the need to end the proactive SIM application session (**AT#STSR=<cmdType>,**16 i.e. “proactive SIM application session terminated by the user” according to GSM 11.14). The TA does not need to respond directly, i.e. **AT#STSR** is not required. It is possible to restart the SAT session from the main menu again with the command **AT#STGI=37**.

#STIA - SIM Toolkit Interface Activation	
	Note: The settings are saved on user profile and available on following reboot. SIM Toolkit activation/deactivation is only performed at power on.
AT#STIA?	Read command can be used to get information about the SAT interface in the format: **#STIA: <state>,<mode>,<timeout>,<SatProfile>** where: **<state>** - the device is in one of the following state: 0 - SIM has not started its application yet 1 - SIM has started its application (SAT main menu ready) **<mode>** - SAT and unsolicited indications enabling status (see above) **<timeout>** - time-out for user responses (see above) **<SatProfile>** - SAT Terminal Profile according to GSM 11.14, i. e. the list of SIM Application Toolkit facilities that are supported by the ME. The profile cannot be changed by the TA. Note: In SAT applications usually an SMS message is sent to the network provider containing service requests, e.g. to send the latest news. The provider returns a message with the requested information. Before activating SAT it is recommended to set the SMS text mode with command **AT+CMGF=1** and to enable unsolicited indications for incoming SMS messages with command **+CNMI**.
AT#STIA=?	Test command returns the range of available values for the parameters **<mode>** and **<timeout>**.
Note	Just one instance at a time, the one which first issued **AT#STIA=*n*** (with ***n*** different from zero), is allowed to issue SAT commands, and this is valid till the same instance issues **AT#STIA=0**. After power cycle another instance can enable SAT.
Note	A typical SAT session on AT interface starts after an **#STN: 37** unsolicited code is received, if enabled(see above). At that point usually an **AT#STGI=37** command is issued (see **#STGI**), and after the SAT main menu has been displayed on TE an **AT#STSR=37,0,x** command is issued to select an item in the menu (see **#STSR**).

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 *if* ***<cmdType>=33*** *(DISPLAY TEXT)* **#STGI: <cmdType>,<cmdDetails>[,<text>]** where: **<cmdDetails>** - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - normal priority 1 - high priority **bits 2 to 7**: reserved for future use **bit 8**: 0 - clear message after a delay 1 - wait for user to clear message **<text>** - text to be displayed to user *if* ***<cmdType>=34*** *(GET INKEY)* **#STGI: <cmdType>,<commandDetails>,<text>** where:

	<commandDetails> - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - Digits only (0-9, *, # and +) 1 - Alphabet set; **bit 2**: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet **bit 3**: 0 - Character sets defined by bit 1 and bit 2 are enabled 1 - Character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested **bits 4 to 7**: 0 **bit 8**: 0 - No help information available 1 - Help information available **<text>** - String as prompt for text. *if* ***<cmdType>=35*** *(GET INPUT)* **#STGI: <cmdType>,<commandDetails>,<text>,<responseMin>, <responseMax>[,<defaultText>]** where: **<commandDetails>** - unsigned Integer used as a bit field. 0..255 - used as a bit field: **bit 1**: 0 - Digits only (0-9, *, #, and +) 1 - Alphabet set **bit 2**: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet **bit 3**: 0 - ME may echo user input on the display 1 - User input shall not be revealed in any way. Hidden entry mode (see GSM 11.14) is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.

	bit 4: 0 - User input to be in unpacked format 1 - User input to be in SMS packed format **bits 5 to 7**: 0 **bit 8**: 0 - No help information available 1 - Help information available **<text>** - string as prompt for text **<responseMin>** - minimum length of user input 0..255 **<responseMax>** - maximum length of user input 0..255 **<defaultText>** - string supplied as default response text *if **<cmdType>=36** (SELECT ITEM)* The first line of output is: **#STGI: <cmdType>,<commandDetails>,<numOfItems>[,<titleText>]** **<CR><LF>** One line follows for every item, repeated for **<numOfItems>**: **#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]** where: **<commandDetails>** - unsigned Integer used as a bitfield 0..255 - used as a bit field: **bit 1**: 0 - Presentation type is not specified 1 - Presentation type is specified in bit 2 **bit 2**: 0 - Presentation as a choice of data values if bit 1 = '1' 1 - Presentation as a choice of navigation options if bit 1 is '1' **bit 3**: 0 - No selection preference

	1 - Selection using soft key preferred **bits 4 to 7**: 0 **bit 8**: 0 - No help information available 1 - Help information available **<numOfItems>** - number of items in the list **<titleText>** - string giving menu title **<itemId>** - item identifier 1..**<numOfItems>** **<itemText>** - title of item **<nextActionId>** - the next proactive command type to be issued upon execution of the menu item. 0 - no next action information available. *if* ***<cmdType>=37*** *(SET UP MENU)* The first line of output is: **#STGI: <cmdType>,<commandDetails>,<numOfItems>,<titleText>** **<CR><LF>** One line follows for every item, repeated for **<numOfItems>**: **#STGI: <cmdType>,<itemId>,<itemText>[,<nextActionId>]** where: **<commandDetails>** - unsigned Integer used as a bitfield 0..255 - used as a bit field: **bit 1**: 0 - no selection preference 1 - selection using soft key preferred **bit 2 to 7**: 0 **bit 8**: 0 - no help information available 1 - help information available

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

	The unsolicited notification sent to the user: **#STN:237** is an indication that the main menu of the SIM Application has been removed from the TA, and it is no longer available. In this case **AT#STGI=37** command response will be always **ERROR**.

5.6.4.3. 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. Power Saving AT Commands

5.6.5.1. Power Saving mode configuration - #PSMWDISACFG

#PSMWDSIACFG – Power Saving mode configuration command	
AT#PSMWDISACFG=<mode>	Set command Power Saving mode. This command is related to W_DISABLE_N pin. Parameter: <mode> - Power Saving Mode 0 : minimum functionality (low power mode) (factory default) 1 : power saving mode which watch W_DISABLE_N pin 2 : ignore on W_DISABLE_N pin 10: enable dying gasp with W_DISABLE_N pin (activated on low edge)

#PSMWDSIACFG – Power Saving mode configuration command	
	Note: after command issued, the modem will be reset. Note: USB suspend mode is not supported (Qualcomm limitation) Note: The setting is maintained for both firmware updates and firmware switches.
AT# PSMWDISACFG ?	display current mode
AT# PSMWDISACFG =?	Test command reports the supported mode
Example	AT#PSMWDISACFG=1 OK AT# PSMWDISACFG? AT# PSMWDISACFG: 1 OK

5.6.5.2. Wake Up Event configuration - #PSMEVTCFG

#PSMEVTCFG – Wake Up Event configuration	
AT#PSMEVTCFG=<SMS>,< Network_Dregistration >	Set command enable/disable each wake up event Parameter: <SMS> 0 - disable (factory default) 1 - enable < Network_Dregistration > 0 - disable (factory default) 1 – enable Note: The setting is maintained for both firmware updates and firmware switches.
AT#PSMEVTCFG?	display current wake up event configurations mask
AT#PSMEVTCFG=?	Test command reports the supported wake up event.

#PSMEVTCFG – Wake Up Event configuration	
Example	AT#PSMEVTCFG=? AT#PSMEVTCFG: (0,1),(0,1) OK AT#PSMEVTCFG = 1,1 OK AT#PSMEVTCFG? AT#PSMEVTCFG = 1,1 OK

5.6.5.3. – WAKE_N pin configuration - #PSMWAKENCFG

#PSMWAKENCFG – WAKE_N pin configuration command	
AT#PSMWAKENCFG=<n>,<t_ring>,<t_pause>	Set command WAKE_N pin configuration Parameter: <n> : number of wake_n , default = 3 <tring> : time of wake_n pin duration, defalut = 100 <tpause> : time of pause the wake_n pin duration, defualt = 100 Note: The time duration is millisecond base Note: If WAKE_N pin configuration changed, reboot the modem required. Note: The setting is maintained for both firmware updates and firmware switches.
AT#PSMWAKENCFG?	display current wake up event configurations mask
AT#PSMWAKENCFG=?	Test command reports the supported wake up event.
Example	AT#PSMWAKENCFG=1,1000,1000 OK AT# PSMWAKENCFG?

#PSMWAKENCFG – WAKE_N pin configuration command	
	AT# PSMWAKENCFG: 1, 1000, 1000 OK

5.6.5.4. Get Wake up events - #PSMEVT

#PSMEVT – Get Wake up events	
AT#PSMEVT	Execution command which display wake up event. This command display source mask, last event source, and Last event source timestamp Format: #PSMEVT: <source mask>,<last event source>,<timestamp> Source Mask: SMS event – 0x00000001 Network_de-registration event – 0x000000002 Note: Time stamp is based on Epoch time and micro seconds.
AT#PSMEVT=?	Test command returns the **OK** result code
Example	SMS event received at 1516708576002437 epoch time (Tuesday, January 23, 2018 11:56:16.002 AM) AT#PSMEVT #PSMEVT: 0x00000001,0x00000001,1516708576002437 OK

5.6.6. QMI Qos Flow Reporting Control AT Commands

5.6.6.1. – QMI Qos Flow Indication Interval - #QOSINTER

#QOSINTER – QMI Qos Flow Indication Interval	
AT#QOSINTER=<interval>	Set command used to set qos flow indication interval. After setting, UE sends QoS flow indicators to Host every the given time interval Parameter:

#QOSINTER – QMI Qos Flow Indication Interval	
	<interval> - qos interval in second unit. 0 – Generating indicators whenever it happens (default) 1..10 – Periodic timer **NOTE:** It works after setting report_global_qos_flows to 1 with qos_indication_register_req (QMI_QOS_INDICATION_REGISTER_REQ_V01). After setting, it periodically operates after receiving the first event (QOS_FLOW_ENABLED_V01 or QOS_FLOW_DISABLED_V01). **NOTE:** The default setting of 0 generates all qos flow indicators. When the non-zero value is set by the command, it operates on the basis of the timer. **NOTE:** The setting is saved in NVM
AT#QOSINTER?	Read command returns the current interval value, in the format: **#QOSINTER:** <interval>
AT#QOSINTER=?	Test command return the supported ranges

5.6.7. Customization Feature AT Commands

5.6.7.1. Get the Setting of Customization Feature - #GETCUSTFEAT

#GETCUSTFEAT – Get the Setting of Customization Feature	
AT#GETCUSTFEAT=<cust_id>	This command used to get the setting of customization feature. Parameter: **<cust_id>** - String of customization feature "AUDIS" - Audio disable "DGACTION" - Dying gasp Action "DGENABLE" - Dying gasp Enable "GPSSEL" - GPS Antenna Select "IPV6ENABLE" - support IPV6 Data Connection The setting of the specified **<cust_id>** will be returned in the format: **#GETCUSTFEAT: <cust_id>,<cust_value>,<cust_attr>** where: **<cust_id>** - String of customization feature "AUDIS" - Audio disable

#GETCUSTFEAT – Get the Setting of Customization Feature	
	"DGACTION" - Dying gasp Action "DGENABLE" - Dying gasp Enable "GPSSEL" - GPS Antenna Select "IPV6ENABLE" – support IPV6 Data Connection **<cust_value>** - Customization setting value "AUDIS" - Audio disable 0 - enable audio 1 - disable audio (default) "DGACTION" - Dying gasp Action (same with #DGENABLE) 0 - Disable sending both detach request and SMS 1 - Enable only the SMS option (default) 2 - Enable only sending detach request 3 - Enable sending both SMS and detach request "DGENABLE" – Dying gasp Enable cust_value[0] – enable/disable dying gasp 0: disable (default) 1: enable cust_value[1] – GPIO number used for dying gasp event monitoring. Refer to AT#GPIO command for available GPIO number range. cust_value[2] – GPIO trigger used for event 0: activate dying gasp when GPIO translates from high to low (default) 1: activate dying gasp when GPIO translates from low to high "GPSSEL" - GPS Antenna Select 0 - Dedicated GPS Port 1 - GPS Rx over AUX Port 2 - GPS Rx over dedicated GPS port with no bias voltage applied. 255 - Invalid data "IPV6ENABLE" – whether to support IPV6 0 - disabled 1 - enabled **<cust_attr>** - Customization setting attribute 0 - read only 1 - read/write
AT#GETCUSTFEAT=?	Test command returns the supported customization features for parameter **<cust_id>**.
Example	AT#GETCUSTFEAT=? #GETCUSTFEAT: ("AUDIS","DGACTION","DGENABLE","GPSSEL","IPV6ENABLE")

#GETCUSTFEAT – Get the Setting of Customization Feature	
	OK AT#GETCUSTFEAT="IPV6ENABLE" #GETCUSTFEAT: "IPV6ENABLE", 1, 1 OK AT#GETCUSTFEAT="DGENABLE" #GETCUSTFEAT="DGENABLE",000,1 OK

5.6.7.2. Set the Customization Feature - #SETCUSTFEAT

#SETCUSTFEAT – Set the Customization Feature	
AT#SETCUSTFEAT=<cust_id>,<cust_value>	Set commands used to set the customization feature.setting of customization feature. Parameter: **<cust_id>** - String of customization feature "AUDIS" - Audio disable "DGACTION" - Dying gasp Action "DGENABLE" - Dying gasp Enable "GPSSEL" - GPS Antenna Select "IPV6ENABLE" – support IPV6 Data Connection **<cust_value>** - Customization setting value "AUDIS" - Audio disable 0 - enable audio 1 - disable audio (default) "DGACTION" - Dying gasp Action (same with #DGENABLE) 0 - Disable sending both detach request and SMS 1 - Enable only the SMS option (default) 2 - Enable only sending detach request 3 - Enable sending both SMS and detach request "DGENABLE" – Dying gasp Enable cust_value[0] – enable/disable dying gasp 0: disable (default) 1: enable cust_value[1] – GPIO number used for dying gasp event monitoring. Refer to #GPIO for available GPIO number range.

#SETCUSTFEAT – Set the Customization Feature	
	cust_value[2] – GPIO trigger used for event 0: activate dying gasp when GPIO translates from high to low (default) 1: activate dying gasp when GPIO translates from low to high “GPSSEL” - GPS Antenna Select 0 - Dedicated GPS Port 1 - GPS Rx over AUX Port 2 - GPS Rx over dedicated GPS port with no bias voltage applied. Note: “GPSSEL” configuration is stored in NVM. “IPV6ENABLE” – whether to support IPV6 0 - disabled 1 - enabled Note: The "AUDIS" setting is saved in system and available on following reboot, therefore manual reboot is required after changing **<cust_value>** of “AUDIS”. Note: The “AUDIS” setting is maintained even after power off. Note: If in case audio is disabled(‘1’), DVI pins are assigned as GPIO pins (GPIO_05~GPIO_08). Note: “DGACTION” configuration is stored in NVM. Note: “DGENABLE” configuration is stored in NVM. Recommend do not use GPIO number ‘3’ because this pin is not wakeup GPIO.
AT#SETCUSTFEAT=?	Test command returns the supported customization features for parameter **<cust_id>**.
Example	AT#SETCUSTFEAT=? #SETCUSTFEAT: ("AUDIS","DGACTION","DGENABLE","GPSSEL","IPV6ENABLE") OK AT#SETCUSTFEAT="IPV6ENABLE",1 OK AT#SETCUSTFEAT="DGENABLE",140 OK

5.6.8. Dying GASP AT Commands

5.6.8.1. Dying GASP Configuration - #DGCFG

#DGCFG – Dying GASP Configuration	
AT#DGCFG=[<DestSMSNumber>[,<DestSMSContent>]]	Set command sets the Dying GASP configuration. Parameters: <**DestSMSNubmer**>: String - SMS Destination Number as string of 8bit ASCII Characters - Max 20 chars <**DestSMSContent**>: String - SMS Content as a string of 8bit ASCII text characters - Max 160 chars
AT#DGCFG?	Read command returns the current Dying GASP setting, in the format: **#DGCFG: <DestSMSNumber>,<DestSMSContent>**
AT#DGCFG=?	Test command reports the supported range of values for parameters **<DestSMSNumber>,<DestSMSContent>.**
Note	The current setting is stored in NVM.

5.6.8.2. Dying GASP Statistics Management - #DGSTAT

#DGSTAT – Dying GASP Statistics Management	
AT#DGSTAT=<mode>	Set command sets to read/clear the Dying GASP Statistics. Parameters: <**mode**>: Integer 0 - Clear the Dying GASP Statistics. 1 - Read the Dying GASP Statistics. When <**mode**> is 1, returns information about the Dying GASP Statistics in the format: **#DGSTAT: <TimeStamp>,<SMSAttemptedFlag>** Where:

#DGSTAT – Dying GASP Statistics Management	
	<TimeStamp>: Timestamp of the last time power loss was detected and Dying Gasp feature was triggered. - UTC time in seconds since Jan 06, 1980 (GPS Epoch). **<SMSAttemptedFlag>** : Indicates whether device attempted to send SMS in the last power loss event. 0 - SMS not attempted 1 - SMS attempted Note: This only indicates device sent the SMS does not guarantee network delivery.
AT#DGSTAT?	Read command returns the current Dying GASP Statistics, in the format: **#DGSTAT: <TimeStamp>,<SMSAttemptedFlag>** Where: **<TimeStamp>**: Timestamp of the last time power loss was detected and Dying Gasp feature was triggered. - UTC time in seconds since Jan 06, 1980 (GPS Epoch). **<SMSAttemptedFlag>**: Indicates whether device attempted to send SMS in the last power loss event. 0 - SMS not attempted 1 - SMS attempted Note: This only indicates device sent the SMS does not guarantee network delivery.
AT#DGSTAT=?	Test command reports the supported range of values for parameters **<mode>**

5.6.8.3. Dying GASP Enable/Disable SMS/Detach Request - #DGENABLE

#DGENABLE – Dying GASP Enable/Disable SMS/Detach Request	
AT#DGENABLE=[<Value>]	Set command which can enable/disable module to send SMS/detach request in Dying Gasp Parameters: **<Value>**: Enable/disable SMS/detach request 0 - Disable sending both detach request and SMS

#DGENABLE – Dying GASP Enable/Disable SMS/Detach Request	
	1 - Enable only the SMS option (default) 2 - Enable only sending detach request 3 - Enable sending both SMS and detach request
AT#DGENABLE?	Read command returns the current setting, in the format: **#DGENABLE: <Value>**
AT#DGENABLE=?	Test command reports the supported range of values for parameters **<Value>.**
Note	The current setting is stored in NVM.

5.6.9. Easy Scan® Extension AT Commands

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

#CSURV (LTE Currently work only if module camped on LTE cell)

#CSURVC (LTE Currently work only if module camped on LTE cell)

5.6.9.1. Network survey - #CSURV

#CSURV - Network Survey	
AT#CSURV[=[<s>,<e>]]	Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURV<CR>**, a full band scan is performed. **Parameters:** **<s>** - starting channel **<e>** - ending channel After issuing the command the device responds with the string: **Network survey started…** and, after a while, a list of informations, one for each received carrier, is reported, each of them in the format: In 2G **(For BCCH-Carrier)** **arfcn:** <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[<arfcn64>]] [numChannels: <numChannels> array: [<ba1> ..[<ba32>]] [pbcch: <pbcch> [nom: <nom> rac: <rac> spgc: <spgc> pat: <pat> nco: <nco> t3168: <t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh: <pcMeasCh>]]] <CR><LF><CR><LF><CR><LF> **where:**

#CSURV - Network Survey	
	<arfcn> - C0 carrier assigned radio channel (BCCH - Broadcast Control Channel). **<bsic>** - base station identification code. **<rxLev>** - decimal number; it is the reception level (in dBm). **<ber>** - decimal number; it is the bit error rate (in %). **<mcc>** - hexadecimal 3-digits number; it is the mobile country code. **<mnc>** - hexadecimal 2-digits number; it is the mobile network code. **<lac>** - location area code. **<cellId>** - cell identifier. **<cellStatus>** - string type; it is the cell status ..**CELL_SUITABLE** - C0 is a suitable cell. **CELL_LOW_PRIORITY** - the cell is low priority based on the received system information. CELL_FORBIDDEN - the cell is forbidden. **CELL_BARRED** - the cell is barred based on the received system information. **CELL_LOW_LEVEL** - the cell **<rxLev>** is low. **CELL**_OTHER - none of the above e.g. exclusion timer running, no BCCH available…etc. **<numArfcn>** - number of valid channels in the Cell Channel Description. **<arfcn*n*>** - arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**) **<numArfcn>** - decimal number; it is the number of valid channels in the Cell Channel Description. **<arfcn*n*>** - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**). **<numChannels>** - decimal number; it is the number of valid channels in the BCCH Allocation list. **<ba*n*>** - decimal number; it is the arfcn of a valid channel in the BA list (***n*** is in the range **1..<numChannels>**). *(The following informations will be printed only if GPRS is supported in the cell)* **<pbcch**> - packet broadcast control channel 0 - pbcch not activated on the cell 1 - pbcch activated on the cell **<nom**> - network operation mode 1 2 3 **<rac**> - routing area code 0..255 - **<spgc**> - SPLIT_PG_CYCLE support ..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell ..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell **<pat>** - priority access threshold 0 - 3..6 -

#CSURV - Network Survey	
	<nco> - network control order 0..2 - **<t3168>** - timer 3168 **<t3192>** - timer 3192 **<drxmax>** - discontinuous reception max time (in seconds) **<ctrlAck>** - packed control ack **<bsCVmax> -** blocked sequenc countdown max value **<alpha> -** alpha parameter for power control **<pcMeasCh> -** type of channel which shall be used for downlink measurements for power control 0 - BCCH 1 - PDCH **(For non BCCH-Carrier)** **arfcn: <arfcn> rxLev: <rxLev>** **where:** **<arfcn>** - decimal number; it is the RF channel **<rxLev>** - decimal number; it is the receiption level (in dBm) In 3G **uarfcn: <uarfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> scr code: <scrcode> cellId: <cellId> lac: <lac> cellStatus: <cellStatus> rscp: <rscp> ecio: <ecio>** **<CR><LF><CR><LF><CR><LF>** **where:** **<uarfcn>** - The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number. **<rxLev>** - decimal number; it is the receiption level (in dBm). **<mcc>** - hexadecimal 3-digits number; it is the mobile country code. **<mnc>** - hexadecimal 2-digits number; it is the mobile network code. **<scrcode>** - decimal number; it is the scrambling code **<cellId>** - cell identifier. **<lac>** - location area code. **<cellStatus>** - string type; it is the cell status. **CELL_SUITABLE** - C0 is a suitable cell. **CELL_LOW_PRIORITY** - the cell is low priority based on the received system information. **CELL_FORBIDDEN** - the cell is forbidden. **CELL_BARRED** - the cell is barred based on the received system information. **CELL_LOW_LEVEL** - the cell **<rxLev>** is low. **CELL_OTHER** - none of the above e.g. exclusion timer running, no BCCH available…etc. **<rscp>** - decimal number; it is the received signal code power (in dBm) **<ecio>** - decimal number; it is the chip energy per total wideband power (in dBm)

#CSURV - Network Survey	
	In 4G (partly implemented) Currently work only if module camped on LTE cell. **For serving cell:** **earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> cellId: <cellId> tac: <tac>** **For neighbor cell:** **earfcn: <earfcn> rxLev: <rxLev> cellId: <cellId>** **Where:** **<earfcn>** - E-UTRA Assigned Radio Channel **<tac>** - Tracking Area Code.
Example	**AT#CSURV** Network survey started ... earfcn: 2500 rxLev: -45 mcc: 450 mnc: 05 cellId: 273 tac: 12556 earfcn: 2500 rxLev: -55 cellId: 64 earfcn: 1350 rxLev: -71 cellId: 64 earfcn: 1350 rxLev: -71 cellId: 99 earfcn: 1350 rxLev: -71 cellId: 256 uarfcn: 10737 rxLev: -57 mcc: 450 mnc: 05 scr code: 224 cellId: 63808804 lac: 8673 cellStatus: CELL_SUITABLE rscp: -60 ecio: -3.5 uarfcn: 10836 rxLev: -66 mcc: 450 mnc: 08 scr code: 1488 cellId: 14909569 lac: 7170 cellStatus: CELL_FORBIDDEN rscp: -69 ecio: -3.5 Network survey ended OK Note: The WCDMA scan info does not reported on LM960A9-P.
Note	1. The command is executed within max. 2 minute.

5.6.9.2. Network Survey (Numeric Format) - #CSURVC

#CSURVC - Network Survey (Numeric Format)	
AT#CSURVC[=[<s>,<e>]]	Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVC<CR>**, a full band scan is performed.

#CSURVC - Network Survey (Numeric Format)	
	Parameters: **<s>** - starting channel **<e>** - ending channel After issuing the command the device responds with the string: **Network survey started…** and, after a while, a list of information, one for each received carrier, is reported, each of them in the format: In 2G **(For BCCH-Carrier)** **<arfcn>,<bsic>,<rxLev>,<ber>,<mcc>,<mnc>,<lac>,<cellId>,<cellStatus>,<numArfcn>[,<arfcn1> ..[<arfcn64>]][,<numChannels>[,<ba1> ..[<ba32>]][,<pbcch>[,<nom>,<rac>,<spgc> <pat> <nco> <t3168> <t3192> <drxmax> <ctrlAck> <bsCVmax>,<alpha>,<pcMeasCh>]]]** **<CR><LF><CR><LF><CR><LF>** **where:** **<arfcn>** - C0 carrier assigned radio channel (BCCH - Broadcast Control Channel). **<bsic>** - base station identification code. **<rxLev>** - decimal number; it is the reception level (in dBm). **<ber>** - decimal number; it is the bit error rate (in %). **<mcc>** - hexadecimal 3-digits number; it is the mobile country code. **<mnc>** - hexadecimal 2-digits number; it is the mobile network code. **<lac>** - location area code. **<cellId>** - cell identifier. **<cellStatus>** - string type; it is the cell status 0 - C0 is a suitable cell (CELL_SUITABLE). 1 - the cell is low priority based on the received system information (CELL_LOW_PRIORITY). 2 - the cell is forbidden (CELL_FORBIDDEN). 3 - the cell is barred based on the received system information (CELL_BARRED). 4 - the cell **<rxLev>** is low (CELL_LOW_LEVEL). 5 - none of the above e.g. exclusion timer running, no BCCH available…etc.. (CELL_OTHER). **<numArfcn>** - decimal number; it is the number of valid channels in the Cell Channel Description **<arfcn*n*>** - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**) **<numChannels>** - decimal number; it is the number of valid channels in the BCCH Allocation list. **<ba*n*>** - decimal number; it is the arfcn of a valid channel in the BA list (***n*** is in the range **1..<numChannels>**). *(The following informations will be printed only if GPRS is supported in the cell)* **<pbcch**> - packet broadcast control channel 0 - pbcch not activated on the cell

#CSURVC - Network Survey (Numeric Format)	
	1 - pbcch activated on the cell **<nom>** - network operation mode 1 2 3 **<rac>** - routing area code 0..255 **<spgc>** - SPLIT_PG_CYCLE support ..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell ..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell **<pat>** - priority access threshold. 0 3..6 **<nco>** - network control order. 0..2 - **<t3168>** - timer 3168. **<t3192>** - timer 3192. **<drxmax>** - discontinuous reception max time (in seconds). **<ctrlAck>** - packed control ack. **<bsCVmax> -** blocked sequenc countdown max value. **<alpha> -** alpha parameter for power control. **<pcMeasCh> -** type of channel which shall be used for downlink measurements for power control. 0 - BCCH 1 - PDCH **(For non BCCH-Carrier)** **<arfcn>,<rxLev>** **where:** **<arfcn>** - decimal number; it is the RF channel **<rxLev>** - decimal number; it is the receiption level (in dBm) In 3G **<uarfcn>,<rxLev>,<mcc>,<mnc>,<scrcode>,<cellId>,<lac>,<cellStatus>,<rscp>,<ecio>** **<CR><LF><CR><LF><CR><LF>** **where:** **<uarfcn>** - The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number **<rxLev>** - decimal number; it is the receiption level (in dBm) **<mcc>** - hexadecimal 3-digits number; it is the mobile country code **<mnc>** - hexadecimal 2-digits number; it is the mobile network code **<scrcode>** - decimal number; it is the scrambling code **<cellId>** - cell identifier. **<lac>** - location area code. **<cellStatus>** - string type; it is the cell status ..CELL_SUITABLE - C0 is a suitable cell.

#CSURVC - Network Survey (Numeric Format)	
	CELL_LOW_PRIORITY - the cell is low priority based on the received system information. **CELL_FORBIDDEN** - the cell is forbidden. **CELL_BARRED** - the cell is barred based on the received system information. **CELL_LOW_LEVEL** - the cell **<rxLev>** is low. CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH available…etc. **<rscp>** - decimal number; it is the received signal code power (in dBm) **<ecio>** - decimal number; it is the chip energy per total wideband power (in dBm) In 4G (partly implemented) Currently work only if module camped on LTE cell. **For serving cell:** **<earfcn>,<rxLev, <mcc>,<mnc>, <cellId>,<tac>** **For neighbor cell:** **<earfcn>,<rxLev>,<cellId>** **Where:** **<earfcn>** - E-UTRA Assigned Radio Channel **<tac>** - Tracking Area Code.
Example	**AT#CSURVC** Network survey started ... 2500,-45,450,05,273,12556 2500,-54,64 2500,-54,99 1350,-71,64 1350,-71,99 1350,-71,256 10836,-66,450,08,1488,14909569,7170,2,-69,-3.5 10737,-60,450,05,224,63808804,8673,0,-64,-4.0 Network survey ended OK Note: The WCDMA scan info does not reported on LM960A9-P.

#CSURVC - Network Survey (Numeric Format)	
Note	The command is executed within max. 2 minute. The information provided by #**CSURVC** is the same as that provided by #**CSURV**. The difference is that the output of #**CSURVC** is in numeric format only.

5.6.10. ECM/RNDIS commands

5.6.10.1. DISCONNECT/CONNECT - #ICMCONNECT

#ICMCONNECT – Establish RNDIS data call	
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.

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

5.6.10.2. LAN configuration - #ICMLANCFG

#ICMLANCFG – Configure LAN Setting	
AT#ICMLANCFG= <GWIPAddress>,<SubNetMask>[,<DHCP>,<Start_IPaddress>,<End_IPaddress>[,<lease_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”

#ICMLANCFG – Configure LAN Setting	
	<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 192.168.225.20 (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 192.168.225.60 (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). 43200 (default) 120 – 2592000 Note:Start_IPaddress and End_IPaddress should be configured within the same subnet as GWIPaddress. Otherwise, module responds 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.
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 – Configure LAN Setting	
	#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
Reference	

5.6.10.3. Enable roaming data call - #ICMROAMINGEN

# ICMROAMINGEN – Restrict or allow data call in roaming area	
AT#ICMROAMINGEN=<mode>	Restrict or allow data call in roaming area Parameters: **<mode>:** 0 : not allowed (default) 1 : allowed
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)

# ICMROAMINGEN – Restrict or allow data call in roaming area	
	OK
Reference	

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 for LM960

GENERIC	2CA: CA_1A-3A, CA_1A-5A, CA_1A-7A, CA_1A-8A, CA_1A-18A, CA_1A-19A, CA_1A-20A, CA_1A-26A, CA_1A-28A, CA_1A-32A, CA_1A-38A, CA_1A-40A, CA_1A-41A, CA_1A-42A, CA_[2A]-[4A], CA_[2A]-5A, CA_[2A]-7A, CA_[2A]-12A, CA_[2A]-28A, CA_[2A]-46A, CA_[2A]-48A, CA_[2A]-[66A], CA_[2A]-71A, CA_3A-5A, CA_3A-7A, CA_3A-8A, CA_3A-19A, CA_3A-20A, CA_3A-26A, CA_3A-28A, CA_3A-32A, CA_3A-38A, CA_3A-40A, CA_3A-42A, CA_[4A]-5A, CA_4A-7A, CA_[4A]-12A, CA_[4A]-28A, CA_[4A]-46A, CA_5A-7A, CA_7A-8A, CA_7A-12A, CA_7A-20A, CA_7A-28A, CA_7A-42A, CA_8A-38A, CA_8A-40A, CA_8A-42A, CA_12A-[66A], CA_20A-32A, CA_20A-38A, CA_20A-40A, CA_20A-42A, CA_26A-[41A], CA_28A-40A, CA_28A-42A, CA_39A-41A, CA_40A-42A, CA_46A-[66A], CA_48A-[66A], CA_[66A]-71A, CA_1A-1A, CA_[2A]-[2A], CA_3A-3A, CA_[4A]-[4A], CA_7A-7A, CA_40A-40A, CA_42A-42A, CA_48A-48A, CA_[66A]-[66A], CA_[2C], CA_3C, CA_7B, CA_7C, CA_8B, CA_12B, CA_38C, CA_39C, CA_40C, CA_[41C], CA_42C, CA_48C, CA_[66B], CA_[66C] 3CA: CA_1A-1A-3A, CA_1A-3A-3A, CA_1A-3A-7A, CA_1A-3A-8A, CA_1A-3A-19A, CA_1A-3A-20A, CA_1A-3A-28A, CA_1A-3A-32A, CA_1A-3A-38A, CA_1A-3A-40A, CA_1A-3A-41A, CA_1A-3A-42A, CA_1A-3C, CA_1A-7A-7A, CA_1A-7A-8A, CA_1A-7A-20A, CA_1A-7A-28A, CA_1A-7A-42A, CA_1A-7C, CA_1A-8A-40A, CA_1A-20A-32A, CA_1A-20A-42A, CA_1A-28A-42A, CA_1A-40C, CA_1A-41C, CA_1A-42C, CA_1A-46C, CA_1C-3A, CA_[2A]-2A-12A, CA_2A-[2A]-12A, CA_[2A]-2A-66A, CA_2A-[2A]-66A, CA_2A-2A-[66A], CA_[2A]-2A-71A, CA_2A-[2A]-71A, CA_[2A]-4A-4A, CA_2A-[4A]-4A, CA_2A-4A-[4A], CA_[2A]-4A-5A, CA_2A-[4A]-5A, CA_[2A]-4A-12A, CA_2A-[4A]-12A, CA_[2A]-4A-29A, CA_2A-[4A]-29A, CA_[2A]-4A-71A, CA_2A-[4A]-71A, CA_2A-7A-12A, CA_[2A]-12A-66A, CA_2A-12A-[66A], CA_[2A]-12B, CA_[2A]-46A-46A, CA_[2A]-46A-66A, CA_2A-46A-[66A], CA_[2A]-46C, CA_[2A]-48A-48A, CA_[2A]-48C, CA_[2A]-48A-66A, CA_2A-48A-[66A], CA_[2A]-66A-66A, CA_2A-[66A]-66A, CA_2A-66A-[66A], CA_[2A]-66A-71A, CA_2A-[66A]-71A, CA_[2A]-

	[66C], CA_[2A]-66C, CA_2A-[66C], CA_3A-3A-7A, CA_3A-3A-8A, CA_3A-3A-20A, CA_3A-3A-28A, CA_3C-5A, CA_3A-7A-7A, CA_3A-7A-8A, CA_3A-7A-20A, CA_3A-7A-28A, CA_3A-7A-42A, CA_3A-7B, CA_3A-7C, CA_3C-7A, CA_3A-8A-38A, CA_3A-8A-40A, CA_3C-8A, CA_3A-20A-32A, CA_3A-20A-42A, CA_3A-28A-40A, CA_3A-28A-42A, CA_3C-20A, CA_3C-28A, CA_3A-40A-40A, CA_3A-40C, CA_3A-42A-42A, CA_3A-42C, CA_3A-46C, CA_3C-32A, CA_3C-38A, CA_3C-40A, CA_4A-4A-7A, CA_[4A]-4A-12A, CA_4A-[4A]-12A, CA_[4A]-4A-71A, CA_4A-[4A]-71A, CA_4A-7A-12A, CA_[4A]-12B, CA_[4A]-46A-46A, CA_[4A]-46C, CA_7A-7A-8A, CA_7A-20A-42A, CA_7C-20A, CA_7B-28A, CA_7C-28A, CA_7A-46C, CA_8A-40C, CA_8A-42C, CA_12A-[66A]-66A, CA_12A-66A-[66A], CA_12A-[66C], CA_19A-42C, CA_20A-38C, CA_28A-40C, CA_28A-42C, CA_40A-40C, CA_40D, CA_40A-42C, CA_40C-42A, CA_42A-42C, CA_42D, CA_46C-[66A], CA_48A-48C, CA_48D, CA_48A-48A-[66A], CA_48C-[66A], CA_[66A]-66A-71A, CA_66A-[66A]-71A 4CA: CA_1A-1A-3A-28A, CA_1A-3A-3A-28A, CA_1A-3A-7A-7A, CA_1A-3A-7C, CA_1A-3A-7A-8A, CA_1A-3A-7A-20A, CA_1A-3A-7A-28A, CA_1A-3A-8A-40A, CA_1A-3A-3A-8A, CA_1A-3A-40C, CA_1A-3A-42C, CA_1A-3C-5A, CA_1A-3C-7A, CA_1A-3C-8A, CA_1A-3C-28A, CA_1A-7C-28A, CA_1A-42D, CA_1A-46D, CA_2A-2A-12A-66A, CA_2A-2A-66A-66A, CA_2A-2A-66A-71A, CA_[2A]-2A-66C, CA_2A-[2A]-66C, CA_2A-2A-[66C], CA_2A-4A-7A-12A, CA_2A-12A-66A-66A, CA_2A-46A-46A-66A, CA_[2A]-46A-46C, CA_[2A]-46C-66A, CA_2A-46C-[66A], CA_[2A]-46D, CA_[2C]-66A-66A, CA_2C-[66A]-66A, CA_2C-66A-[66A], CA_3A-3A-7A-7A, CA_3A-3A-7A-8A, CA_3A-3A-7A-20A, CA_3A-3A-7A-28A, CA_3A-5A-7A-7A, CA_3A-7A-7A-8A, CA_3A-7C-20A, CA_3A-7C-28A, CA_3A-28A-40C, CA_3A-28A-42C, CA_3A-40D, CA_3A-46D, CA_3C-7A-20A, CA_3C-7A-28A, CA_3C-7C, CA_3C-40C, CA_[4A]-46A-46C, CA_[4A]-46D, CA_7A-46D, CA_28A-40D, CA_28A-46D, CA_40C-40C, CA_40C-42C, CA_40E, CA_[41C]-42C, CA_42C-42C, CA_42E, CA_46A-46C-[66A], CA_46D-[66A], CA_48D-[66A], CA_48E

	5CA: CA_1A-3A-7C-28A, CA_1A-3C-7C, CA_1A-3C-40C, CA_2A-46A-46C-66A, CA_2A-46D-66A, CA_3A-28A-40D, CA_3C-7C-28A, CA_3A-40E 2ULCA: UL_1A-7A, UL_1A-8A, UL_1A-28A, UL_3A-7A, UL_3A-8A, UL_3A-20A, UL_3A-28A, UL_4A-7A, UL_3C, UL_7C, UL_38C, UL_39C, UL_40C, UL_41C, UL_42C
ATT	2CA: CA_[2A]-[2A], CA_[2A]-[4A], CA_2A-5A, CA_2A-12A, CA_2A-14A, CA_2A-29A, CA_2A-30A, CA_[2A]-46A, CA_[2A]-[66A], CA_2C, CA_[4A]-[4A], CA_4A-5A, CA_4A-12A, CA_4A-29A, CA_4A-30A, CA_[4A]-46A, CA_5A-30A , CA_5A-66A, CA_5B, CA_12A-30A, CA_12A-66A, CA_12B, CA_14A-30A, CA_14A-66A, CA_29A-30A, CA_29A-66A, CA_30A-66A, CA_[66A]-[66A], CA_66B, CA_66C 3CA: CA_2A-2A-5A, CA_[2A]-2A-12A, CA_2A-2A-14A, CA_2A-2A-30A, CA_2A-2A-66A, CA_[2A]-4A-4A, CA_2A-[4A]-[4A], CA_[2A]-4A-5A, CA_2A-[4A]-5A, CA_[2A]-4A-12A, CA_2A-[4A]-12A, CA_2A-4A-30A, CA_2A-5A-30A, CA_[2A]-5A-66A, CA_2A-5A-[66A], CA_2A-12A-30A, CA_[2A]-12A-66A, CA_2A-12A-[66A], CA_2A-14A-30A, CA_2A-14A-66A, CA_2A-29A-30A, CA_2A-30A-66A, CA_2A-46C, CA_2A-66A-66A, CA_[4A]-4A-5A, CA_[4A]-4A-12A, CA_4A-4A-30A, CA_4A-5A-30A, CA_4A-12A-30A, CA_4A-12B, CA_4A-29A-30A, CA_5A-30A-66A, CA_5A-66A-66A, CA_5A-66C, CA_12A-30A-66A, CA_12A-[66A]-66A, CA_14A-30A-66A, CA_14A-66A-66A, CA_29A-30A-66A, CA_29A-66A-66A, CA_30A-66A-66A 4CA: CA_2A-2A-5A-30A, CA_2A-2A-5A-66A, CA_2A-2A-12A-30A, CA_2A-2A-12A-66A, CA_2A-2A-14A-66A, CA_2A-2A-29A-30A, CA_2A-2A-66A-66A, CA_2A-4A-4A-12A, CA_2A-4A-5A-30A, CA_2A-

	4A-12A-30A, CA_2A-5A-30A-66A, CA_2A-5A-66A-66A, CA_2A-5B-30A, CA_2A-5B-66A, CA_2A-12A-30A-66A, CA_2A-12A-66A-66A, CA_2A-14A-30A-66A, CA_2A-14A-66A-66A, CA_2A-29A-30A-66A, CA_[2A]-46D, CA_[4A]-46D, CA_4A-4A-12A-30A, CA_5A-30A-66A-66A, CA_5B-30A-66A, CA_5B-66A-66A, CA_12A-30A-66A-66A, CA_14A-30A-66A-66A, CA_29A-30A-66A-66A, CA_46D-[66A] 5CA: CA_2A-2A-46D, CA_2A-5B-30A-66A, CA_2A-5B-66A-66A, CA_2A-46D-66A, CA_5B-30A-66A-66A, CA_46D-66A-66A 2ULCA: UL_2A-12A, UL_2A-5A, UL_4A-12A, UL_5A-66A, UL_5B, UL_12A-66A
VZW	2CA: CA_[2A]-[2A], CA_[2A]-[4A], CA_[2A]-5A, CA_[2A]-13A, CA_[2A]-[66A], CA_[4A]-[4A], CA_[4A]-5A, CA_[4A]-13A, CA_5A-[66A], CA_5B, CA_13A-[66A], CA_[66A]-[66A], CA_[66B], CA_[66C], CA_[2A]-48A, CA_13A-48A, CA_48A-[66A] 3CA: CA_[2A]-2A-5A, CA_[2A]-2A-13A, CA_[2A]-2A-66A, CA_2A-2A-[66A], CA_[2A]-4A-5A, CA_2A-[4A]-5A, CA_[2A]-4A-13A, CA_2A-[4A]-13A, CA_[2A]-5A-66A, CA_2A-5A-[66A], CA_[2A]-13A-66A, CA_2A-13A-[66A], CA_[2A]-66A-66A, CA_2A-[66A]-66A, CA_[2A]-[66B], CA_[2A]-[66C], CA_[4A]-4A-5A, CA_[4A]-4A-13A, CA_5A-[66A]-66A, CA_5A-[66B], CA_5A-[66C], CA_13A-[66A]-66A, CA_13A-[66B], CA_13A-[66C], CA_[66A]-[66C], CA_[66D], CA_[2A]-48A-48A, CA_[2A]-48A-66A, CA_2A-48A-[66A], CA_[2A]-48C, CA_13A-48A-48A, CA_13A-48A-[66A], CA_13A-48C, CA_48A-48A-[66A], CA_48A-[66A]-66A, CA_48A-[66B], CA_48C-[66A] 4CA: CA_2A-48A-48A-66A, CA_[2A]-48D, CA_13A-48A-48A-66A, CA_13A-48A-48C, CA_13A-48C-[66A], CA_13A-48D, CA_48A-48A-66A-66A, CA_48A-48A-[66B], CA_48A-48A-[66C], CA_48A-48C-[66A], CA_48D-[66A]

	5CA: CA_2A-48E, CA_13A-48A-48C-66A, CA_13A-48C-48C, CA_13A-48D-66A, CA_13A-48E, CA_48A-48C-66B, CA_48A-48C-66C, CA_48C-48C-66A, CA_48E-66A 2ULCA: UL_2A-13A, UL_4A-13A
SPRINT	2CA: CA_[25A]-[25A], CA_[25A]-26A, CA_25A-41A, CA_26A-[41A], CA_[41A]-[41A[, CA_[41C] 3CA: CA_[25A]-25A-26A, CA_26A-[41C], CA_[41A]-[41C], CA_[41D], CA_25A-41C 4CA: CA_25A-41D, CA_[41C]-41C, CA_[41A]-41D, CA_41E 2ULCA: UL_41C

7.2. CA List Supported Per Variant for LM960A18

GENERIC	2CA: CA_1A-3A, CA_1A-5A, CA_1A-7A, CA_1A-8A, CA_1A-18A, CA_1A-19A, CA_1A-20A, CA_1A-26A, CA_1A-28A, CA_1A-32A, CA_1A-38A, CA_1A-40A, CA_1A-41A, CA_1A-42A, CA_[2A]-[4A], CA_[2A]-5A, CA_[2A]-7A, CA_[2A]-12A, CA_[2A]-28A, CA_[2A]-46A, CA_[2A]-48A, CA_[2A]-[66A], CA_[2A]-71A, CA_3A-5A, CA_3A-7A, CA_3A-8A, CA_3A-19A, CA_3A-20A, CA_3A-26A, CA_3A-28A, CA_3A-32A, CA_3A-38A, CA_3A-40A, CA_3A-42A, CA_[4A]-5A, CA_4A-7A, CA_[4A]-12A, CA_[4A]-28A, CA_[4A]-46A, CA_5A-7A, CA_7A-8A, CA_7A-12A, CA_7A-20A, CA_7A-28A, CA_7A-42A, CA_8A-38A, CA_8A-40A, CA_8A-42A, CA_12A-[66A], CA_20A-32A, CA_20A-38A, CA_20A-40A, CA_20A-42A, CA_26A-[41A], CA_28A-40A, CA_28A-42A, CA_39A-41A, CA_40A-42A, CA_46A-[66A], CA_48A-[66A], CA_[66A]-71A, CA_1A-1A, CA_[2A]-[2A], CA_3A-3A, CA_[4A]-[4A], CA_7A-7A, CA_40A-40A, CA_42A-42A, CA_48A-48A, CA_[66A]-

	[66A], CA_[2C], CA_3C, CA_7B, CA_7C, CA_8B, CA_12B, CA_38C, CA_39C, CA_40C, CA_[41C], CA_42C, CA_48C, CA_[66B], CA_[66C] 3CA: CA_1A-1A-3A, CA_1A-3A-3A, CA_1A-3A-7A, CA_1A-3A-8A, CA_1A-3A-19A, CA_1A-3A-20A, CA_1A-3A-28A, CA_1A-3A-32A, CA_1A-3A-38A, CA_1A-3A-40A, CA_1A-3A-41A, CA_1A-3A-42A, CA_1A-3C, CA_1A-7A-7A, CA_1A-7A-8A, CA_1A-7A-20A, CA_1A-7A-28A, CA_1A-7A-42A, CA_1A-7C, CA_1A-8A-40A, CA_1A-20A-32A, CA_1A-20A-42A, CA_1A-28A-42A, CA_1A-40C, CA_1A-41C, CA_1A-42C, CA_1A-46C, CA_1C-3A, CA_[2A]-2A-12A, CA_2A-[2A]-12A, CA_[2A]-2A-66A, CA_2A-[2A]-66A, CA_2A-2A-[66A], CA_[2A]-2A-71A, CA_2A-[2A]-71A, CA_[2A]-4A-4A, CA_2A-[4A]-4AC, CA_2A-4A-[4A], CA_[2A]-4A-5A, CA_2A-[4A]-5A, CA_[2A]-4A-12A, CA_2A-[4A]-12A, CA_[2A]-4A-29A, CA_2A-[4A]-29A, CA_[2A]-4A-71A, CA_2A-[4A]-71A, CA_2A-7A-12A, CA_[2A]-12A-66A, CA_2A-12A-[66A], CA_[2A]-12B, CA_[2A]-46A-46A, CA_[2A]-46A-66A, CA_2A-46A-[66A], CA_[2A]-46C, CA_[2A]-48A-48A, CA_[2A]-48C, CA_[2A]-48A-66A, CA_2A-48A-[66A], CA_[2A]-66A-66A, CA_2A-[66A]-66A, CA_2A-66A-[66A], CA_[2A]-66A-71A, CA_2A-[66A]-71A, CA_[2A]-[66C], CA_[2A]-66C, CA_2A-[66C], CA_3A-3A-7A, CA_3A-3A-8A, CA_3A-3A-20A, CA_3A-3A-28A, CA_3C-5A, CA_3A-7A-7A, CA_3A-7A-8A, CA_3A-7A-20A, CA_3A-7A-28A, CA_3A-7A-42A, CA_3A-7B, CA_3A-7C, CA_3C-7A, CA_3A-8A-38A, CA_3A-8A-40A, CA_3C-8A, CA_3A-20A-32A, CA_3A-20A-42A, CA_3A-28A-40A, CA_3A-28A-42A, CA_3C-20A, CA_3C-28A, CA_3A-40A-40A, CA_3A-40C, CA_3A-42A-42A, CA_3A-42C, CA_3A-46C, CA_3C-32A, CA_3C-38A, CA_3C-40A, CA_4A-4A-7A, CA_[4A]-4A-12A, CA_4A-[4A]-12A, CA_[4A]-4A-71A, CA_4A-[4A]-71A, CA_4A-7A-12A, CA_[4A]-12B, CA_[4A]-46A-46A, CA_[4A]-46C, CA_7A-7A-8A, CA_7A-20A-42A, CA_7C-20A, CA_7B-28A, CA_7C-28A, CA_7A-46C, CA_8A-40C, CA_8A-42C, CA_12A-[66A]-66A, CA_12A-66A-[66A], CA_12A-[66C], CA_19A-42C, CA_20A-38C, CA_28A-40C, CA_28A-42C, CA_40A-40C, CA_40D, CA_40A-42C, CA_40C-42A, CA_42A-42C, CA_42D, CA_46C-[66A], CA_48A-48C, CA_48D, CA_48A-48A-[66A], CA_48C-[66A], CA_[66A]-66A-71A, CA_66A-[66A]-71A

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ATT	2CA: CA_[2A]-[4A], CA_[2A]-5A, CA_2A-7A, CA_[2A]-12A, CA_[2A]-14A, CA_[2A]-29A, CA_2A-30A, CA_[2A]-46A, CA_[2A]-48A, CA_[2A]-[66A], CA_[2A]-71A, CA_[4A]-5A, CA_4A-7A, CA_[4A]-12A, CA_[4A]-29A, CA_4A-30A, CA_[4A]-46A, CA_[4A]-71A, CA_5A-30A, CA_5A-[66A], CA_7A-12A, CA_12A-30A, CA_12A-[66A], CA_14A-30A, CA_14A-[66A], CA_[25A]-26A, CA_25A-41A, CA_26A-[41A], CA_29A-30A, CA_29A-[66A], CA_30A-66A, CA_46A-[66A], CA_48A-[66A], CA_[66A]-71A, CA_[2A]-[2A], CA_[4A]-[4A], CA_[25A]-[25A], CA_[41A]-[41A], CA_48A-48A, CA_[66A]-[66A], CA_[2C], CA_5B,

CA_7C, CA_12B, CA_[41C], CA_48C, CA_[66B], CA_[66C]

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CA_2A-2A-5A-30A, CA_2A-2A-5A-66A, CA_2A-2A-12A-30A, CA_2A-2A-12A-66A, CA_2A-2A-29A-30A, CA_2A-2A-66A-66A, CA_2A-2A-66A-71A, CA_[2A]-2A-66C, CA_2A-[2A]-66C, CA_2A-2A-[66C], CA_2A-4A-4A-12A, CA_2A-4A-5A-30A, CA_2A-4A-7A-12A, CA_2A-4A-12A-30A, CA_2A-5A-30A-66A, CA_2A-5A-66A-66A, CA_2A-5B-30A, CA_[2A]-5B-66A, CA_2A-5B-[66A], CA_2A-12A-30A-66A, CA_2A-12A-66A-66A, CA_2A-29A-30A-66A, CA_2A-46A-46A-66A,

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7.3. CA List Supported Per Variant for LM960A9-P

CBRS	2CA: CA_42A-42A, CA_48A-48A, CA_42C, CA_48C 3CA: CA_42A-42C, CA_42D, CA_48A-48C, CA_48D 2ULCA: UL_42C

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	2017-12-20	Initial release
1	2018-11-01	**New:** #CAINFO, #TESTMODE, #LAPS, #PSMWDISACFG, #PSMWAKENCFG, #PSMEVTCFG, #PSMEVT, #ICMP, #HOSTODIS, #TMLVL **Update:** #QSS, #SIMDET, #BND, $LCSAGLO, #LCFC,#RXTOGGLE, #RXDIV, +WS46, #USB3TUNE, #USBCFG, +COPS, #ACTIVEFW, +CEMODE, #LRXDIV, #GETFW, #TEMPSENS, #FASTSHDN, +CLCK, +CMGD, +CSCA, +CMGS, +CMSS, +CMGW **Deleted:** S0, S1, +CHUP, +CRC, +CVHU, +CSTA, +CLIP, +CLIR, +COLP, +COLR, +CCFC, +CCWA, +CHLD, +CTFR, +CUSD, +CAOC, +CLCC, +CSSN, +CDIP, +VTS, +VTD, #SMSFORMAT, #ISMSCFG
2	2019-09-04	**New:** #SHDNIND, #AUDIS, #FIRMWARE, #LTECAT, #WWANLED, #FDOR, #GETCUSTFEAT, #SETCUSTFEAT, #DGCFG, #DGSTAT, #LOCAUTOSTART, #DGENABLE, #LOCNMEATYPE, #SMSFORMAT, #ISMSCFG, 5.5.5. 3GPP2 AT Commands for SMS, #4RXDIS, #CQI, #UPTIME, **Update:** #LAPS, +CSCA, +CMGS, +CMSS, +CMGW, +CNMI, +CMGL, +CMGR, #BND, #LRXDIV, #GPIO, #TESTMODE, #ENS, #LCFC, #GETFW, #PERSISTAPN, #QOSINTER, #FASTSHDN, #ACTIVEFW, #CAINFO, $GPSNMUN, $GPSNMUNEX, +CGCLASS, #HOSTODIS, #PSMWDISACFG, +CPMS, #SIMDET, +CSCB, #GPIO, #SHDN
3	2020-01-07	**New:** #GETFWEXT, #ACTIVEFWEXT, #FWPLS, #CSURV, #CSURVC **Update:** #BND, $LCSLPP, #LAPS, #USBCFG, #LCFC

4	2020-03-10	**Update:** Applicability table corrected
5	2020-05-28	**New:** LM960A9-P project in section 4(availability table), CA list supported for LM960A9-P as section 7.3 #CLATENA, #ICMCONNECT, #ICMLANCFG, #ICMROAMINGEN, #LTECAT, +ODIS **Update:** #LCFC,#LTECAT **Delete:**
6_draft	2020-XX-XX	**New:** **Update:** **Delete:**

SUPPORT INQUIRIES

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

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