AT Commands Reference Guide

For UE910 V2

Making machines talk.

APPLICABILITY TABLE

PRODUCT
UE910-EU V2
UE910-NA V2

SW Version
19.10.XX2

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Contents

1. Introduction

1.1. Scope

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

1.2. Audience

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

1.3. Contact Information, Support

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

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

Alternatively, use:
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Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.
Telit appreciates feedback from the users of our information.

1.4. Document Organization

This document contains the following chapters:

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

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

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

1.5.   Text Conventions

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

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

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

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

1.6.   Related Documents

- ETSI GSM 07.07 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/07_series/07.07/

- ETSI GSM 07.05 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/07_series/07.05/

- Hayes standard AT command set

2.   Overview

2.1.   About the document

This document is to describe all AT commands implemented on the Telit wireless module
UE910 V2.

3.   AT COMMANDS

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

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

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

3.1.   Definitions

The following syntactical definitions apply:

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

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

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

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

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

3.2. AT Command Syntax

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

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

- **Action type commands**. This type of command may be "executed" or "tested".

  - "executed" to invoke a particular function of the equipment, which generally involves more than the simple storage of a value for later use

  - "tested" to determine:
    Whether or not the equipment implements the Action Command (in this case issuing the correspondent Test command - trailing **=?** - returns the **OK** result code), and, if sub parameters are associated with the action, the ranges of sub parameters values that are supported.

     Action commands don't store the values of any of their possible sub parameters.
     In case of Telit command, "read" action may be used for the specific purpose.
Moreover:
     The response to the Test Command (trailing **=?**) may be changed in the future by Telit to   allow the description of new values/functionalities

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

3.2.1. String Type Parameters

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

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

3.2.2.   Command Lines

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

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

- **ATCMD1<CR>** where **AT** is the command line prefix, **CMD1** is the body of a **basic command** (nb: the name of the command never begins with the character "+") and **<CR>** is the command line terminator character

- **ATCMD2=10<CR>** where 10 is a sub parameter
- **AT**+CMD1;+CMD2=, ,10<CR> these are two examples of **extended commands** (nb: the name of the command always begins with the character "+"[2]). They are delimited with semicolon. In the second command the sub parameter is omitted.

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

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

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

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

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

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

If command **V0** is enabled (numeric responses codes), and all commands in a command line has been performed successfully, result code **0<CR>** is sent from the TA to the TE, if sub-parameter values of a command are not accepted by the TA or command itself is invalid, or

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

command cannot be performed for some reason, result code **4<CR>** and no subsequent commands in the command line are processed.

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

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

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

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

Numeric Format	Verbose Format
General errors:	
0	phone failure
1	No connection to phone
2	phone-adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network time-out
32	network not allowed - emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
General purpose error:	
100	unknown
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)*

Numeric Format	Verbose Format
112	Location area not allowed (#12)*
113	Roaming not allowed in this location area (#13)*
GPRS related errors to a failure to Activate a Context and others:	
132	service option not supported (#32)*
133	requested service option not subscribed (#33)*
134	service option temporarily out of order (#34)*
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
Easy GPRS® related errors	
550	generic undocumented error
551	wrong state
552	wrong mode
553	context already activated
554	stack already active
555	activation failed
556	context not opened
557	cannot setup socket
558	cannot resolve DN
559	timeout in opening socket
560	cannot open socket
561	remote disconnected or time-out
562	connection failed
563	tx error
564	already listening
Network survey errors	
657	Network survey error (No Carrier)*
658	Network survey error (Busy)*
659	Network survey error (Wrong request)*
660	Network survey error (Aborted)*
Supplementary service related error	
257	network rejected request
258	retry operation
259	invalid deflected to number
260	deflected to own number
261	unknown subscriber
262	service not available
263	unknown class specified
264	unknown network message
AT+COPS test command related error	
680	LU processing
681	Network search aborted
682	PTM mode
AT+WS46 test command related error	
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
500	unknown error

3.2.5.   Information Responses and Result Codes

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

- Information response to **+CMD1?**

  <CR><LF>+CMD1:2,1,10<CR><LF>

- Information response to **+CMD1=?**

  <CR><LF>+CMD1(0-2),(0,1),(0-15)<CR><LF>

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

Moreover, there are other two types of result codes:

- *result code*s that inform about progress of TA operation (e.g. connection establishment **CONNECT**)

- *Result code*s that indicate occurrence of an event not directly associated with issuance of a command from TE (e.g. ring indication **RING**).

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

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

3.2.6.   Command Response Time-Out

Every command issued to the Telit modules returns a result response if response codes are enabled

(default). The time needed to process the given command and return the response varies, depending

on the command type. Commands that do not interact with the SIM or the network, and involve only

internal set up settings or readings, have an immediate response, depending on SIM

configuration (e.g., number of contacts stored in the phonebook, number of stored SMS), or on the

network the command may interact with.

In the table below are listed only the commands whose interaction with the SIM or the network could

lead to long response timings. When not otherwise specified, timing is referred to set command.

For phonebook and SMS writing and reading related commands, timing is referred to commands

issued after phonebook sorting is completed.

For DTMF sending and dialing commands timing is referred to module registered on network

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

Command	Estimated maximum time to get response (Seconds)
+COPS	125 (test command)
+CLCK	15 (SS operation) 5 (FDN enabling/disabling)
+CPWD	15 (SS operation) 5 (PIN modification)
+CLIP	15 (read command)
+CLIR	15 (read command)
+CCFC	15
+CCWA	15
+CHLD	60
+CPIN	30
+CPBS	5 (FDN enabling/disabling)
+CPBR	5 (single reading) 15 (complete reading of a 500 records full phonebook)

+CPBF	10 (string present in a 500 records full phonebook) 5 (string not present)
+CPBW	5
+CACM	5
+CAMM	5
+CPUC	180
+VTS	20 (transmission of full "1234567890*#ABCD" string with no delay between tones, default duration)
+CSCA	5 (read and set commands)
+CSAS	5
+CRES	5
+CMGS	120 after CTRL-Z; 1 to get '>' prompt
+CMSS	120 after CTRL-Z; 1 to get '>' prompt
+CMGW	5 after CTRL-Z; 1 to get '>' prompt
+CMGD	5 (single SMS cancellation) 25 (cancellation of 50 SMS)
+CNMA	120 after CTRL-Z; 1 to get '>' prompt
+CMGR	5
+CMGL	100
+CGACT	150
+CGATT	140
D	120 (voice call) Timeout set with ATS7 (data call)
A	60 (voice call) Timeout set with ATS7 (data call)
H	60
+CHUP	60
+COPN	10
+COPL	180
+WS 46	10
#MBN	10
#TONE	5 (if no duration specified)
#EMAILD	60

#MSCLASS	15
#STSR	30
#GPRS	150
#SKTD	140 (DNS resolution + timeout set with AT#SKTCT)
#QDNS	170
#FTPOPEN	120 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPCLOSE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPTYPE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPDELE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPPWD	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPCWD	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPLIST	500 (timeout set with AT#FTPTO, in case no response is received from server) + time to get listing
#FTPPUT	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPFSIZE	500 (timeout set with AT#FTPTO, in case no response is received from server)
#FTPAPP	500 (timeout set with AT#FTPTO, in case no response is received from server)
#SGACT	150
#SH	10
#SD	140 (DNS resolution + connection timeout set with AT#SCFG)
#CSURV	125
#CSURVC	125
#CSURVUC	125
#CSURVB	125
#CSURVBC	125
#CSURVP	125
#CSURVPC	125
+CECALL	120

3.2.7. Command Issuing Timing

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

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

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

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

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

3.3.   Storage

3.3.1.   Factory Profile and User Profiles

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

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

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

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

GSM DATA MODE :	+CBST
AUTOBAUD :	+IPR
COMMAND ECHO:	E
RESULT MESSAGES:	Q
VERBOSE MESSAGES:	V
EXTENDED MESSAGES:	X
FLOW CONTROL OPTIONS:	&K, +IFC
DSR (C107) OPTIONS: &S	
DTR (C108) OPTIONS: &D	
DCD (C109) OPTIONS :	&C
RI (C125) OPTIONS : \R	
POWER SAVING:	+CFUN
DEFAULT PROFILE:	&Y0
S REGISTERS:	S0;S1;S2;S3;S4;S5;S7;S12;S25;S30;S38
CHARACTER FORMAT:	+ICF

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

+FCLASS,	+CLIR,	+DR,
+CSCS,	+CR,	+CRLP,
+CRC,	+CSNS,	+CVHU,
+CREG,	+CLIP,	+CNMI,

+CCWA,	+CUSD,	+CAOC,
+CSSN,	+CIND,	+CMER,
+CPBS,	+CMEE,	+CGREG,
+CMGF,	+CSDH,	
#QSS,	#ACAL,	#PSMRI
#ACALEXT,	#ECAM,	#SMOV,
#MWI,	#NITZ,	#SKIPESC,
#STIA,	#E2ESC	#CFLO
#SIMDET	#SIMPR	#NOPT
+CALM,	+CRSL,	+CMUT,
+CLVL,	+VTD,	+CGEREP
#PCMTXG	#PCMRXG	#DVICFG
#CAP,	#SRS,	#SRP,
#STM,	#DVI,	#E2SMSRI,
#CODEC,	#SHFEC,	#HFMICG3,
#HSMICG,	#SHFSD,	#SPKMUT,
#E2SLRI,	#PSEL,	
#HFRECG	#HSRECG,	#SHFAGC,
#SHSAGC,	#SHSEC,	#SHSNR,
#SHFNR,	#SHSSD,	#TSVOL,
#TEMPMON (lt is partially stored in NVM, see command description),		#CFF,
#PSNT,	+CTZU,	+CTZR,
+CSTF,	+CSDF,	+CAPD,
#CESTHLCK ,	+CSTA,	+CSIL,
+CSVM,	+COLP,	+CCWE,
#NWEN,	#CODECINFO,	

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

#SELINT,	+COPS[3],	+CGCLASS,
+CGDCONT,	+CGQMIN,	+CGQREQ,
+CGEQMIN,	+CGEQREQ,	+WS46,
#DIALMODE,	#BND,	#AUTOBND,
#SCFG,	#AUTOATT,	+CGSMS
#DNS,	#ICMP,	#TTY,
#SCFGEXT,	#SCFGEXT2,	#SGACTCFG,
#SGACTCFGEXT,	#BASE64,	#PLMNMODE,
#ENS,	#SMSATRUN,	#SMSATRUNCFG,
#TCPATRUNCFG,	#TCPATRUNFRWL,	#TCPATRUNAUTH,
#TCPATRUNL,	#TCPATRUND,	#ENAEVMONI,
#ENAEVMONICFG,	#EVMONI	

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

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

+CSCA,	+CSMP,	+CSCB

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

#SLED
Stored by #SLEDSAV command.

#VAUX
Stored by #VAUXSAV command.

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

Stored by #SKTSAV command and automatically restored at start up; factory default values are restored by #SKTRST command.

#ESMTP,	#EADDR,	#EUSER,
#EPASSW		

Stored by #ESAV command and automatically restored at start up; factory default values are restored by #ERST command.

#BIQUADIN	#BIQUADINEX	#BIQUADINEXS
#BIQUADOUT	#BIQUADOUTEX	#BIQUADOUTEXS

Stored by #PSAV command and automatically restored at startup; factory default values are restored by #PRST command.

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

4. AT Commands Availability Table

COMMAND	UE910-EU V2	UE910-NA V2	Function
Command Line General Format – Command Line Prefixes			
AT	•	•	Starting A Command Line
A/	•	•	Last Command Automatic Repetition Prefix
#/	•	•	Repeat Last Command
General Configuration Commands			
#SELINT	•	•	Select Interface Style
#NOPT	•	•	Set Notification Port
Hayes AT Commands – Generic Modem Control			
&F	•	•	Set To Factory-Defined Configuration
Z	•	•	Soft Reset
+FCLASS	•	•	Select Active Service Class
&Y	•	•	Designate A Default Reset Basic Profile
&P	•	•	Designate A Default Reset Full Profile
&W	•	•	Store Current Configuration
&Z	•	•	Store Telephone Number In The Module Internal Phonebook
&N	•	•	Display Internal Phonebook Stored Numbers
+GMI	•	•	Manufacturer Identification
+GMM	•	•	Model Identification
+GMR	•	•	Revision Identification
+GCAP	•	•	Capabilities List
+GSN	•	•	Serial Number
&V	•	•	Display Current Base Configuration And Profile
&V0	•	•	Display Current Configuration And Profile
&V1	•	•	S Registers Display
&V3	•	•	Extended S Registers Display

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

+DS	•	•	Data Compression
+DR	•	•	Data Compression Reporting
Hayes AT Commands – Break Control			
\B	•	•	Transmit Break To Remote
\K	•	•	Break Handling
\N	•	•	Operating Mode
Hayes AT Commands – S Parameters			
S0	•	•	Number Of Rings To Auto Answer
S1	•	•	Ring Counter
S2	•	•	Escape Character
S3	•	•	Command Line Termination Character
S4	•	•	Response Formatting Character
S5	•	•	Command Line Editing Character
S7	•	•	Connection Completion Time-Out
S12	•	•	Escape Prompt Delay
S25	•	•	Delay To DTR Off
S30	•	•	Disconnect Inactivity Timer
S38	•	•	Delay Before Forced Hang Up
3GPP TS 27.007 AT Commands – General			
+CGMI	•	•	Request Manufacturer Identification
+CGMM	•	•	Request Model Identification
+CGMR	•	•	Request Revision Identification
+CGSN	•	•	Request Product Serial Number Identification
+CSCS	•	•	Select TE Character Set
+CIMI	•	•	Request International Mobile Subscriber Identity (IMSI)
+CMUX	•	•	Multiplexing Mode
3GPP TS 27.007 AT Commands – Call Control			
+CHUP	•	•	Hang Up Call
+CBST	•	•	Select Bearer Service Type
+CRLP	•	•	Radio Link Protocol
+CR	•	•	Service Reporting Control
+CEER	•	•	Extended Error Report

+CRC	•	•	Cellular Result Codes
+CSNS	•	•	Single Numbering Scheme
+CVHU	•	•	Voice Hang Up Control
+CSTA	•	•	Select Type of Address
3GPP TS 27.007 AT Commands – Network Service Handling			
+CNUM	•	•	Subscriber Number
+COPN	•	•	Read Operator Names
+CREG	•	•	Network Registration Report
+COPS	•	•	Operator Selection
+WS46	•	•	PCCA STD-101 Select Wireless Network
+CLCK	•	•	Facility Lock/Unlock
+CPWD	•	•	Change Facility Password
+CLIP	•	•	Calling Line Identification Presentation
+CLIR	•	•	Calling Line Identification Restriction
+COLP	•	•	Connected Line Identification Presentation
+COLR	•	•	Connected line identification restriction status
+CCFC	•	•	Call Forwarding Number And Conditions
+CCWA	•	•	Call Waiting
+CHLD	•	•	call deflection
+CTFR	•	•	Unstructured Supplementary Service Data
+CUSD	•	•	Unstructured Supplementary Service Data
+CAOC	•	•	Advice Of Charge
+CLCC	•	•	List Current Calls
+CSSN	•	•	SS Notification
+CCUG	•	•	Closed User Group Supplementary Service Control
+CPOL	•	•	Preferred Operator List
+CPLS	•	•	Selection of Preferred PLMN List
3GPP TS 27.007 AT Commands – Mobile Equipment Control			
+CPAS	•	•	Phone Activity Status
+CFUN	•	•	Set Phone Functionality

+CPIN	●	●	Enter PIN
+CSQ	●	●	Signal Quality
+CIND	●	●	Indicator Control
+CMER	●	●	Mobile Equipment Event Reporting
+CPBS	●	●	Select Phonebook Memory Storage
+CPBR	●	●	Read Phonebook Entries
+CPBF	●	●	Find Phonebook Entries
+CPBW	●	●	Write Phonebook Entry
+CCLK	●	●	Clock Management
+CALA	●	●	Alarm Management
+CALD	●	●	Delete Alarm
+CAPD	●	●	Postpone alarm
+CSDF	●	●	Time Zone reporting
+CSTF	●	●	Setting time format
+CTZR	●	●	Automatic Time Zone update
+CTZU	●	●	Setting time format
+CRSM	●	●	Restricted SIM Access
+CSIM	●	●	Generic SIM Access
+CALM	●	●	Alert Sound Mode
+CRSL	●	●	Ringer Sound Level
+CLVL	●	●	Loudspeaker Volume Level
+CMUT	●	●	Microphone Mute Control
+CSIL	●	●	Silence command
+CACM	●	●	Accumulated Call Meter
+CAMM	●	●	Accumulated Call Meter Maximum
+CPUC	●	●	Price Per Unit And Currency Table
+CCWE	●	●	Call Meter maximum event
+CSVM	●	●	Set voice mail number
+CLAC	●	●	Available AT commands
+CCHO	●	●	Open Logical Channel
+CCHC	●	●	Close Logical Channel
+CGLA	●	●	Generic UICC Logical Channel access
+CUAD	●	●	UICC Application Discovery

+CPINR	•	•	Remaining PIN retries
3GPP TS 27.007 AT Commands – Mobile Equipment Errors			
+CMEE	•	•	Report Mobile Equipment Error
3GPP TS 27.007 AT Commands – Voice Control			
+VTS	•	•	DTMF Tones Transmission
+VTD	•	•	Tone Duration
3GPP TS 27.007 AT Commands – Commands For GPRS			
+CGCLASS	•	•	GPRS Mobile Station Class
+CGATT	•	•	GPRS Attach Or Detach
+CGEREP	•	•	GPRS 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)
+CGPADDR	•	•	Show PDP Address
+CGCMOD	•	•	Modify PDP State
3GPP TS 27.007 AT Commands – Commands For Battery Charger			
+CBC	•	•	Battery Charge
3GPP TS 27.005 AT Commands – Message Configuration			
+CSMS	•	•	Select Message Service
+CPMS	•	•	Preferred Message Storage
+CMGF	•	•	Message Format
3GPP TS 27.005 AT Commands – Message Configuration			
+CSCA	•	•	Service Center Address
+CSMP	•	•	Set Text Mode Parameters
+CSDH	•	•	Show Text Mode Parameters
+CSCB	•	•	Select Cell Broadcast Message Types

+CSAS	•	•	Save Settings
+CRES	•	•	Restore Settings
+CMMS	•	•	More Messages to Send
3GPP TS 27.005 AT Commands – Message Receiving And Reading			
+CNMI	•	•	New Message Indications To Terminal Equipment
+CNMA	•	•	New Message Acknowledgment to ME/TA
+CMGL	•	•	List Messages
+CMGR	•	•	Read Message
3GPP TS 27.005 AT Commands – Message Sending And Writing			
+CMGS	•	•	Send Message
+CMSS	•	•	Send Message From Storage
+CMGW	•	•	Write Message To Memory
+CMGD	•	•	Delete Message
+CGSMS	•	•	Select Service for MO SMS messages
Custom AT Commands – General Configuration			
+PACSP	•	•	Network Selection Menu Availability
#CGMI	•	•	Manufacturer Identification
#CGMM	•	•	Model Identification
#CGMR	•	•	Revision Identification
#CGSN	•	•	Product Serial Number Identification
#CIMI	•	•	International Mobile Subscriber Identity (IMSI)
#CCID	•	•	Read ICCID (Integrated Circuit Card Identification)
#SPN	•	•	Service Provider Name
#CEER	•	•	Extended Numeric Error report
#CEERNET	•	•	Extended Error report for Network Reject cause
#PCT	•	•	Display PIN Counter
#SHDN	•	•	Software Shut Down
#REBOOT	•	•	Reboot
#Z	•	•	Extended Reset
#WAKE	•	•	Wake From Alarm Mode
#TEMPMON	•	•	Temperature monitor

#GPIO	•	•	General Purpose Input/Output Pin Control
#ALARMPIN	•	•	Alarm Pin
#SLED	•	•	STAT_LED GPIO Setting
#SLEDSAV	•	•	Save STAT_LED GPIO Setting
#E2SMSRI	•	•	SMS Ring Indicator
#ADC	•	•	Analog/Digital Converter Input
#DAC	•	•	Digital/Analog Converter Control
#VAUX	•	•	Auxiliary Voltage Output Control
#VAUXSAV	•	•	#VAUX Saving
#V24CFG	•	•	V24 Output Pins Configuration
#V24	•	•	V24 Output Pins Control
#CBC	•	•	Battery and Charger Status
#AUTOATT	•	•	GPRS Auto-Attach Property
#MSCLASS	•	•	Multislot Class Control
#MONI	•	•	Cell Monitor
#CQI	•	•	HSDPA Channel Quality Indication
#SERVINFO	•	•	Serving Cell Information
#RFSTS	•	•	Radio Satus of 3G Network
#QSS	•	•	Query SIM Status
#CPBD	•	•	Delete All Phonebook Entries
#DIALMODE	•	•	ATD Dialing Mode
#ACAL	•	•	Automatic Call
#ACALEXT	•	•	Extended Automatic Call
#ECAM	•	•	Extended Call Monitoring
#SMOV	•	•	SMS Overflow
#MBN	•	•	Mailbox Numbers
#MWI	•	•	Message Waiting Indicator
#PSNT	•	•	Packet Service Network Type
#SIMPR	•	•	SIM Presence Status
#CFF	•	•	Call Forwarding Flags
#CODEC	•	•	Audio Codec
#NITZ	•	•	Network Timezone
#ENS		•	Enhanced network selection

#BND	•	•	Select Band
#PLMNMODE	•	•	Apply to New Operator Names
#AUTOBND	•	•	Automatic Band Selection
#GAUTH	•	•	PPP-GPRS Connection Authentication Type
#SKIPESC	•	•	Skip Escape Sequence
#SNUM	•	•	Subscriber Number
#SIMDET	•	•	SIM Dection Mode
#CGPADDR	•	•	Show Address
#CESTHLCK	•	•	Call Establishment Lock
#I2CWR	•	•	I2C data via GPIO
#I2CRD	•	•	I2C data from GPIO
#PSMRI	•	•	Power Saving Mode Ring Indicator
#CFLO	•	•	Command Mode Flow Control
#CMGLCONCINDEX	•	•	Report concatenated SMS indexes
#CODECINFO	•	•	Codec Information
#LANG	•	•	Select Language
#ENCALG	•	•	Set Encryption Algorithm
#E2ESC	•	•	Escape Sequence Guard Time
#RTCSTAT	•	•	RTC Status
#GSMAD	•	•	GSM Antenna Detection
#NWSCANTMR	•	•	Network Selection Timer
#LEDEN			LED Pin Control
#HWREV	•	•	Hardware Identification
#NRMUSR	•	•	Non Volatile Storage
#COLR	•	•	Connected line identification restriction
#ECTD	•	•	Enhanced call tone disable
#RXDIV			Enable RX Div and Set DARP
#EONS		•	Enhanced operator name string
#DCSD	•	•	Disable incoming CSD call
#CPBGR	•	•	Read Group Entries
#CPBGW	•	•	Write Group Entries
Custom AT Commands – Multisocket AT commands			

#SS	•	•	Socket Status
#SI	•	•	Socket Info
#SGACT	•	•	Context Activation
#SGACTCFG	•	•	Context Activation & Configuration
#SGACTCFGEXT	•	•	Context Activation & Configuration Extended
#SH	•	•	Socket Shutdown
#SCFG	•	•	Socket Configuration
#SCFGEXT	•	•	Socket Configuration Extended
#SCFGEXT2	•	•	Socket Configuration Extended2
#SD	•	•	Socket Dial
#SO	•	•	Socket Restore
#ST	•	•	Socket Type
#SL	•	•	Socket Listen
#SLUDP	•	•	UDP Socket Listen
#SA	•	•	Socket Accept
#SRECV	•	•	Received Data In Command Mode
#SSEND	•	•	Send Data In Command Mode
#SSENDEXT	•	•	Send Data In Command mode extended
#SSENDUDP	•	•	Send UDP data to a specific remote host
#SSENDUDPEXT	•	•	Send UDP data to a specific remote host extended
#SGACTAUTH	•	•	Easy GPRS Authentication Type
#BASE64	•	•	Base64 encoding/decoding of Socket snet/received data
Custom AT Commands – FTP AT commands			
#FTPTO	•	•	FTP Time-Out
#FTPOPEN	•	•	FTP Open
#FTPCLOSE	•	•	FTP Close
#FTPCFG	•	•	FTP Config
#FTPPUT	•	•	FTP Put
#FTPGET	•	•	FTP Get
#FTPGETPKT	•	•	FTPGET in command mode
#FTPTYPE	•	•	FTP Type

#FTPMSG	•	•	FTP Read Message
#FTPDELE	•	•	FTP Delete
#FTPPWD	•	•	FTP Print Working Directory
#FTPCWD	•	•	FTP Change Working Directory
#FTPLIST	•	•	FTP List
#FTPSIZE	•	•	Get file size
#FTPAPP	•	•	FTP Append
#FTPREST	•	•	Set restart position
#FTPRECV	•	•	Receive Data in command mode
#FTPAPPEXT	•	•	FTP Append Extended
Custom AT Commands – SSL AT commands			
#SSLCFG	•	•	Configure general parameters of a SSL socket
#SSLD	•	•	Opening a socket SSL to a remote server
#SSLEN	•	•	Enabling a SSL socket
#SSLH	•	•	Closing a SSL socket
#SSLO	•	•	Restoring a SSL socket after a +++
#SSLRECV	•	•	Reading data from a SSL socket
#SSLS	•	•	Reporting the status of a SSL socket
#SSLSECDATA	•	•	Managing the security data
#SSLSEND	•	•	Sending data through a SSL socket
#SSLSENDEXT	•	•	Sending data through a secure socket in Command Mode extended
#SSLSECCFG	•	•	Configure security parameters of a SSL socket
Custom AT Commands – Enhanced Easy GPRSÒ Extension			
#USERID	•	•	Authentication User ID
#PASSW	•	•	Authentication Password
#PKTSZ	•	•	Packet Size
#DSTO	•	•	Data Sending Time-Out
#SKTTO	•	•	Socket Inactivity Time-Out
#SKTSET	•	•	Socket Definition
#QDNS	•	•	Query DNS
#CACHEDNS	•	•	DNS Response Caching

#DNS	•	•	Manual DNS Selection
#SKTCT	•	•	Socket TCP Connection Time-Out
#SKTSAV	•	•	Socket Parameters Save
#SKTRST	•	•	Socket Parameters Reset
#GPRS	•	•	GPRS Context Activation
#SKTD	•	•	Socket Dial
#SKTL	•	•	Socket Listen
#E2SLRI	•	•	Socket Listen Ring Indicator
#FRWL	•	•	Firewall Setup
#GDATAVOL	•	•	GPRS Data Volume
#ICMP	•	•	ICMP Support
#PING	•	•	Ping Request
Custom AT Commands – SMS			
#SMSMOVE	•	•	Move Short Message To Other Memory
#SMSMODE	•	•	SMS Commands Operation Mode
Custom AT Commands – E-Mail Mangement			
#ESMTP	•	•	E-mail SMTP Server
#EADDR	•	•	E-mail Sender Address
#EUSER	•	•	E-mail Authentication User Name
#EPASSW	•	•	E-mail Authentication Password
#EMAILD	•	•	E-mail Sending
#SMTPCL	•	•	E-mail Sending with attachment
#ESAV	•	•	E-mail Parameters Save
#ERST	•	•	E-mailParameters Reset
#EMAILMSG	•	•	SMTP Read Message
Custom AT Commands –HTTP AT Commands			
#HTTPCFG	•	•	Configure HTTP parameters
#HTTPQRY	•	•	Send HTTP GET, HEAD or DELETE request
#HTTPSND	•	•	Send HTTP server data
#HTTPRCV	•	•	Receive HTTP server data
Custom AT Commands - Easy ScanÒ Extension			
#CSURV	•	•	Network Survey
#CSURVC	•	•	Network Survey (Numeric Format)

#CSURVU	•	•	Network Survey Of User Defined Channels
#CSURVUC	•	•	Network Survey Of User Defined Channels (Numeric Format)
#CSURVB	•	•	BCCH Network Survey
#CSURVBC	•	•	BCCH Network Survey (Numeric Format)
#CSURVF	•	•	Network Survey Format
#CSURVNLF	•	•	<CR><LF> Removing On Easy Scan® Commands Family
#CSURVEXT	•	•	Extended Network Survey
#CSURVP	•	•	PLMN Network Survey
#CSURVPC	•	•	PLMN Network Survey (Numeric Format)
Custom AT Commands - SIM Toolkit			
#STIA	•	•	SIM Toolkit Interface Activation
#STGI	•	•	SIM Toolkit Get Information
#STSR	•	•	SIM Toolkit Send Response
Custom AT Commands - Jammed Detect & Report AT commands			
#JDR	•	•	Jammed Detect & Report
Custom AT Commands – SAP AT Commands			
#RSEN	•	•	Remote SIM enable
Custom AT Commands - Audio AT Commands			
#CAP	•	•	Change Audio Path
#SRS	•	•	Select Ringer Sound
#SRP	•	•	Select Ringer Path
#HFMICG	•	•	Handsfree Microphone Gain
#HSMICG	•	•	Handset Microphone Gain
#HFRECG	•	•	Handsfree Receiver Gain
#HSRECG	•	•	Handset Receiver Gain
#PCMTXG	•	•	PCM Tx Volume
#PCMRXG	•	•	PCM Rx Volume
#SHFSD	•	•	Set Headset Sidetone
#SHSSD	•	•	Set Handset Sidetone
#SPKMUT	•	•	Speaker Mute Control
#OAP	•	•	Open Audio Loop
#STM	•	•	Signaling Tones Mode

#TONE	•	•	Tone Playback
#TONEEXT	•	•	Extended tone generation
#TSVOL	•	•	Tone Classes Volume
#UDTSET	•	•	User Defined Tone SET
#UDTSAV	•	•	Save User Defined Tones
#UDTRST	•	•	User Defined Tone Reset
#PRST	•	•	Audio Profile Factory Configuration
#PSAV	•	•	Audio Profile Configuration Save
#PSEL	•	•	Audio Profile Selection
#BIQUADIN	•	•	Uplink Path Biquad Filters
#BIQUADINEX	•	•	Extended Uplink Biquad Filters
#BIQUADINEXS	•	•	Second Extended Uplink Biquad Filters
#BIQUADOUT	•	•	Cascaded filters
#BIQUADOUTEX	•	•	Extended Downlink Biquad Filters
#BIQUADOUTEXS	•	•	Second Extended Downlink Biquad Filters
#SHFEC	•	•	Handsfree Echo Canceller
#SHSEC	•	•	Handset Echo Canceller
#SHSAGC	•	•	Handest Automatic Gain
#SHFAGC	•	•	Handsfree Automatic Gain Control
#SHFNR	•	•	Handsfree Noise Reduction
#SHSNR	•	•	Handset Noise Reduction
#DTMF	•	•	Embedded DTMF decoder enabling
#DVI	•	•	Digital Voiceband Interface
#DVICFG	•	•	DVI configuration
#TTY	•	•	TeleType Writer - #TTY
Custom AT Commands - Audio file management and Play			
#ASIZE	•	•	Audio available size
#ALIST	•	•	List audio file
#ADELF	•	•	Delete an audio file
#ADELA	•	•	Delete all files
#ASEND	•	•	Send an audio file
#ARECV	•	•	Receive an audio file

#ARERD	•	•	Record an audio file
#APLAY	•	•	Play an audio file
#ACONF	•	•	Configure audio file format
Custom AT Commands - Audio AT Commands			
#EMRGD	•	•	Dial an emergency call
#MSDPUSH	•	•	IVS Push mode activation
#MSDSEND	•	•	Sending MSD data to IVS
#NWEN	•	•	Network Emergency Number Update
+CECALL	•	•	Initiate eCall
Custom AT Commands – AT Run Commands			
#SMSATRUN	•		Enable SMS AT Run service
#SMSATRUNCFG	•		Set SMS AT Run Parameters
#SMSATWL	•		SMS AT Run White List
#TCPATRUNCFG	•		Set TCP AT Run Service Parameters
#TCPATRUNL	•		Enables TCP AT Run Service in listen (server) mode
#TCPATRUNFRWL	•		TCP AT Run Firewall List
#TCPATRUNAUTH	•		TCP AT Run Authentication Parameters List
#TCPATRUND	•		Enable TCP AT Run Service in dial (client) mode
#TCPATRUNCLOSE	•		Closing TCP Run AT Socket
#TCPATCMDSEQ	•		TCP AT Run Command Sequence
#TCPATCONSER	•		TCP Run AT Service to a Serial Port
#ATRUNDELAY	•		Run AT command execution
Custom AT Commands – Event Monitor Commands			
#ENAEVMONI	•	•	Enable EvMoni Service
#ENAEVMONICFG	•	•	Set EvMoni Service Parameters
#EVMONI	•	•	Event Monitoring
#CMGS	•	•	Send Message
#CMGW	•	•	Write Message To Memory

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

5.1.1.3.   Repeat Last Command - #/

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

5.2.   General Configuration Commands

5.2.1.1.   Select Interface Style - #SELINT

#SELINT - Select interface style	
AT#SELINT=<v>	Set command sets the AT command interface style depending on parameter <v>. Parameter: <v> - AT command interface 2 - switches the AT command interface style of the product, to UE910 V2 family
AT#SELINT?	Read command reports the current interface style.
AT#SELINT=?	Test command reports the available range of values for parameter <v>.
Note	It is suggested to reboot the module after every #SELINT setting.

5.2.1.2.   Set Notification Port - #NOPT

#NOPT - Set notification port	

AT#NOPT=<num>	Set command specify the port output notification data (URC messages)
	
	Parameter:
	<num> - Notification Port
	  0 – All Ports; URC messages are sent to all ports. < default value >
	  1 – UART Main Port only
	  2 – Telit USB Modem Port only
	  3 – Telit USB Auxiliary Port only
	  4 – Multiplxer DLCI1 Port only
	  5 – Multiplxer DLCI2 Port only
	  6 – Multiplxer DLCI3 Port only
	  7 – Mulitplexer DLCI4 Port only
	  8 – ATRUN SMS Port only
	  9 – ATRUN TCP Port only
	  10 – Telit USB Modem OBEX Port only
	  11 – Telit USB Auxiliary OBEX Port only
	  12 – SIMTool Kit Port only
	  13 – JAVA VM Port only
	  14 – Python MDM Port only
	  15 – Python MDM2 Port only
	
	Note : URC message sent out on this port only if the port is opened for AT interface and enabled as notification(URC) service.

#NOPT - Set notification port	
	Note : If the port is closed and enabled as notification(URC) service, URC message will be discarded. Note : Main UART & Telit USB Modem & Telit USB Auxilairy Ports opened for AT interface at power on time, automatically and other ports opened by the specific behaviour, as below. Multiplexer DLCI 1-4 Ports: Multiplexer(+CMUX) is running Python MDM 1-2 Ports : Python VM is running ATRUN SMS/TCP Ports : ATRUN is running SIMTool Kit Port only : SIMTool Kit Application support RUN AT is running JAVA VM Port only : JAVA VM is running
AT#NOPT?	Read command reports the current notification port.
AT#NOPT=?	Test command reports the available range of values for parameter **<num>**.

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 or the extended section is 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**.
Reference	V25ter.

5.3.1.3.   Select Active Service Class - +FCLASS

+FCLASS - Select Active Service Class	

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

AT+FCLASS?	Read command returns the current configuration value of the parameter **<n>**.
AT+FCLASS=?	Test command returns all supported values of the parameters **<n>**.
Reference	3GPP TS 27.007

5.3.1.4.   Default Reset Basic Profile Designation - &Y

&Y - Default Reset Basic Profile Designation	

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

5.3.1.5.   Default Reset Full Profile Designation - &P

&P - Default Reset Full Profile Designation	

AT&P[<n>]	Execution command defines which full profile will be loaded on start up.
	
	Parameter:
	<n>
	  0..1 – profile number: the wireless module is able to store 2 full configurations
	       (see command **&W**).

&P - Default Reset Full Profile Designation	
	Note: differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&P** will be loaded on every start up.
	Note: if parameter is omitted, the command has the same behaviour as **AT&P0**
Reference	Telit Specifications

5.3.1.6.   Store Current Configuration - &W

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

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

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

5.3.1.8.   Display Internal Phonebook Stored Numbers - &N

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

5.3.1.9.   Manufacturer Identification - +GMI

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

5.3.1.10.   Model Identification - +GMM

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

5.3.1.11.   Revision Identification - +GMR

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

5.3.1.12.   Capabilities List - +GCAP

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

5.3.1.13.   Serial Number - +GSN

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

5.3.1.14.   Display Current Base Configuration And Profile - &V

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

5.3.1.15.   Display Current Configuration And Profile - &V0

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

5.3.1.16.   S Registers Display - &V1

&V1 - S Registers Display	

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

5.3.1.17.   Extended S Registers Display - &V3

&V3 - Extended S Registers Display	

AT&V3	Execution command returns the value of the **S** registers in decimal and hexadecimal value in the format:
	
	  REG DEC HEX
	 <reg0> <dec> <hex>
	 <reg1> <dec> <hex>
	 ...
	where
	<reg*n*> - **S** register number
	  000..005
	  007
	  012
	  025
	  030
	  038
	<dec> - current value in decimal notation
	<hex> - current value in hexadecimal notation

5.3.1.18.   Display Last Connection Statistics - &V2

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

5.3.1.19.   Single Line Connect Message - \V

\V - Single Line Connect Message	

\V - Single Line Connect Message	

AT\V<n>	Execution command set single line connect message.
	
	Parameter:
	<n>
	  0 - off
	  1 - on

5.3.1.20. Country Of Installation - +GCI

+GCI - Country Of Installation	
AT+GCI=<code>	Set command selects the installation country code according to ITU-T.35 Annex A. Parameter: **<code>** 59 - it currently supports only the Italy country code
AT+GCI?	Read command reports the currently selected country code.
AT+GCI=?	Test command reports the supported country codes.
Reference	V25ter.

5.3.1.21. Line Signal Level - %L

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

5.3.1.22. Line Quality - %Q

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

5.3.1.23. Speaker Loudness - L

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

5.3.1.24. Speaker Mode - M

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

5.3.2.   DTE - Modem Interface Control

5.3.2.1.   Command Echo - E

E - Command Echo	

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

Reference	V25ter

5.3.2.2.   Quiet Result Codes - Q

Q - Quiet Result Codes	

ATQ[<n>]	Set command enables or disables the result codes.
	
	Parameter:
	<n>
	  0 - enables result codes (factory default)
	  1 - disables result codes
	  2 - disables result codes (only for backward compatibility)
	
	Note: After issuing either **ATQ1** or **ATQ2** every information text transmitted in response to commands is not affected
	
	Note: if parameter is omitted, the command has the same behaviour of **ATQ0**

Example	*After issuing ATQ1 or ATQ2* AT+CGACT=? **+CGACT: (0-1) nothing is appended to the response**
Reference	V25ter

5.3.2.3.   Response Format - V

V - Response Format	
ATV[<n>]	Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (see [§3.2.5 Information Responses And Result Codes] for the table of result codes). Parameter: **<n>**

V - Response Format	
	0 - limited headers and trailers and numeric format of result codes

information responses	<text><CR><LF>
result codes	<numeric code><CR>

1 - full headers and trailers and verbose format of result codes (factory default)

information responses	<CR><LF> <text><CR><LF>
result codes	<CR><LF> <verbose code><CR><LF>

Note: the **<text>** portion of information responses is not affected by this setting.

Note: if parameter is omitted, the command has the same behaviour of ATV0

Reference	V25ter

5.3.2.4. Extended Result Codes - X

X - Extended Result Codes	
ATX[<n>]	Set command selects the result code messages subset used by the modem to inform the **DTE** of the result of the commands. Parameter: **<n>** 0 - send only **OK**, **CONNECT**, **RING**, **NO CARRIER**, **ERROR**, **NO ANSWER** results. A busy tone 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

I - Identification Information	

	result code.
	
	Parameter:
	\<n\>
	  0 - numerical identifier.
	  1 - module checksum
	  2 - checksum check result
	  3 - manufacturer
	  4 - product name
	  5 - DOB version
	
	Note: if parameter is omitted, the command has the same behaviour of **ATI0**

Reference	V25ter

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

&C - Data Carrier Detect (DCD) Control	

AT&C[\<n\>]	Set command controls the RS232 **DCD** output behaviour.
	
	Parameter:
	\<n\>
	  0 - **DCD** remains **high** always.
	  1 - **DCD** follows the Carrier detect status: if carrier is detected **DCD** is high,
	     otherwise **DCD** is **low**. (factory default)
	  2 - **DCD off** while disconnecting
	
	Note: if parameter is omitted, the command has the same behaviour of **AT&C0**
	
	Note: **AT&C** has to be removed from the list of AT command whose parameters are stored in NVM.

Reference	V25ter

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

&D - Data Terminal Ready (DTR) Control	

AT&D[\<n\>]	Set command controls the Module behaviour to the RS232 **DTR** transitions.
	
	Parameter:
	\<n\>
	  0 - **DTR** transitions are ignored. (factory default)
	  1 - when the MODULE is connected, the **High** to **Low** transition of **DTR** pin sets the device in command mode, the current connection is NOT closed.
	  2 - when the MODULE is connected , the **High** to **Low** transition of **DTR** pin sets the device in command mode and the current connection is closed.
	  3 – device ignores **DTR** transitions.
	  4 - **C108/1** operation is disabled.
	  5 - **C108/1** operation is enabled; same behaviour as for \<n\>=**2**

&D - Data Terminal Ready (DTR) Control	
	Note: if a connection has been set up issuing either **#SKTD** , then **AT&D1** has the same effect as **AT&D2**. If a connection has been set up issuing AT#SD then AT&D1 and AT&D2 have different effect, as described above. Note: if **AT&D2** has been issued and the **DTR** has been tied **Low**, autoanswering is inhibited and it is possible to answer only issuing command **ATA**. Note: Recommended that AT&D2 is issued prior to dial-up network service from DTE. If DTR event is ignored, DCE could be stuck in dormant state in a situation that DCE is not able to communicate with NW(like No service) and DTE tries to disconnect dial-up service. If voice is activated with data service simultaneously, refer to AT+CVHU command guide. Note: if parameter is omitted, the command has the same behaviour of **AT&D0**
Reference	V25ter

5.3.2.1.   Standard Flow Control - \Q

\Q - Standard Flow Control	

AT\Q[<n>]	Set command controls the RS232 flow control behaviour.
	
	Parameter:
	<n>
	  0 - no flow control
	  3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default)
	
	Note: if parameter is omitted, the command has the same behaviour as **AT\Q0**
	
	Note: Hardware flow control (**AT\Q3**) is not active in command mode.
	
	Note: \Q's settings are functionally a subset of &K's ones.

Reference	V25ter

5.3.2.2.   Flow Control - &K

&K - Flow Control	

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

&K - Flow Control	
	check the settings of the active profile issuing **AT&V**. Note: Hardware flow control (**AT&K3**) is not active in command mode.

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

&S - Data Set Ready (DSR) Control	

AT&S[<n>]	Set command controls the RS232 **DSR** pin behaviour.
	
	 Parameter:
	 <n>
	  0 - always **High**
	  1 - follows the GSM traffic channel indication.
	  2 - **High** when connected
	  3 - **High** when device is ready to receive commands (factory default).
	
	 Note: if option 1 is selected then **DSR** is tied **High** when the device receives from the network the UMTS traffic channel indication.
	
	 Note: in power saving mode the **DSR** pin is always tied **Low** & USB_VBUS pin is always tied Low.
	
	 Note: if parameter is omitted, the command has the same behaviour of **AT&S0**
	
	 Note: If option 1 or 2 is active, **DSR** will not tie **High** in case of GSM voice connection.

5.3.2.4.   Ring (RI) Control - \R

\R - Ring (RI) Control	

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

5.3.2.5.   Fixed DTE Interface Rate - +IPR

+IPR - Fixed DTE Interface Rate	
AT+IPR=<rate>	Set command specifies the **DTE** speed (UART only) at which the device accepts commands during command mode operations; it may be used to fix the **DTE-DCE** interface speed.

+IPR - Fixed DTE Interface Rate	

	NOTE: DTE speed of USB port is always 0. DTE speed of USB does not change.
	
	Parameter:
	<rate>
	 -
	  300
	  600
	  1200
	  2400
	  4800
	  9600
	  19200
	  38400
	  57600
	  115200 (default)
	  230400
	  460800
	  921600
	  3200000
	  4000000
	
	If **<rate>** is specified and not 0, **DTE-DCE** speed is fixed at that speed, hence no speed auto-detection (autobauding) is enabled.

AT+IPR?	Read command returns the current value of +**IPR** parameter.
AT+IPR=?	Test command returns the list of supported autodetectable **<rate>** values and the list of fixed-only **<rate>** values in the format: +**IPR**:(list of supported autodetectable **<rate>** values), (list of fixed-only **<rate>** values)
Reference	V25ter

5.3.2.6.   DTE-Modem Local Flow Control - +IFC

+IFC - DTE-Modem Local Flow Control	

AT+IFC=<by_te>, <by_ta>	Set command selects the flow control behaviour of the serial port in both directions: from **DTE** to **modem** (**<by_ta>** option) and from **modem** to **DTE** (**<by_te>**)
	
	Parameters:
	<by_te> - flow control option for the data received by **DTE**
	  0 - flow control None
	  2 - **C105** (**RTS**) (factory default)
	
	<by_ta> - flow control option for the data sent by **modem**
	  0 - flow control None
	  2 - **C106** (**CTS**) (factory default)

+IFC - DTE-Modem Local Flow Control	
	The supported flow control list as follows

<by_te>	<by_ta>
0	0
2	2

+IFC - DTE-Modem Local Flow Control	
	Note: Software flow control (XON/XOFF) not supported. Only possible commands are AT+IFC=0,0 and AT+IFC=2,2. Note: Hardware flow control (**AT+IFC=2,2**) is not active in command mode. Note: This command is equivalent to **&K** command.
AT+IFC?	Read command returns active flow control settings. Note: If flow control behaviour has been set with **AT&Kn** command with the parameter that is not allowed by **AT+IFC** the read command **AT+IFC?** will return: **+IFC: 0,0**
AT+IFC=?	Test command returns all supported values of the parameters **<by_te>** and **<by_ta>**.
Reference	V25ter

5.3.2.7.　　DTE-Modem Character Framing - +ICF

+ICF - DTE-Modem Character Framing	
AT+ICF=[<format>,[<parity>]]	Set command defines the asynchronous character framing to be used when autobauding is disabled. Parameters: **<format>** - determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame. 　1 - 8 Date, 2 Stop 　2 - 8 Data, 1 Parity, 1 Stop 　3 - 8 Data, 1 Stop (default) 　5 - 7 Data, 1 Parity, 1 Stop **<parity>** - determines how the parity bit is generated and checked, if present; setting this sub parameter is mandatory and has a meaning only if **<format>** subparameter is either 2 or 5 otherwise is not allowed. 　0 - Odd (not supported) 　1 - Even (not supported)
AT+ICF?	Read command returns current settings for sub parameters **<format>** and **<parity>**. If current setting of subparameter **<format>** is neither 2 nor 5, the current setting of subparameter **<parity>** will always be represented as 0.
AT+ICF=?	Test command returns the ranges of values for the parameters **<format>** and **<parity>**
Reference	V25ter
Example	*8N2* AT+ICF=1 OK *8O1* AT+ICF=2,0 OK *8E1* AT+ICF=2,1 OK *8N1* AT+ICF = 3 (default) OK *7O1* AT+ICF=5,1 OK *7E1* AT+ICF=5,1 OK

5.3.3.   Call Control

5.3.3.1.   Dial – D

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

D – Dial	
	M also). "MB" - mailbox numbers stored on SIM, if this service is provided by the SIM (see **#MBN**). **<n>** - entry location; it should be in the range of locations available in the memory used.
ATD><n>[;]	Issues a call to phone number in entry location **<n>** of the active phonebook memory storage (see +**CPBS**). If "**;**" is present a **voice** call is performed. Parameter: **<n>** - active phonebook memory storage entry location; it should be in the range of locations available in the active phonebook memory storage.
ATDL	Issues a call to the last number dialed.
ATDS=<nr>[;]	Issues a call to the number stored in the MODULE internal phonebook position number **<nr>**. **If ";" is present a voice** call is performed. Parameter: **<nr>** - internal phonebook position to be called (See commands **&N** and **&Z**)

ATD<number>I[;]
ATD<number>i[;]
	Issues a call overwriting the CLIR supplementary service subscription default value for this call
	If "**;**" is present a **voice** call is performed.
	
	  I - invocation, restrict CLI presentation
	  i - suppression, allow CLI presentation

ATD<number>G[;] **ATD<number>g[;]**	Issues a call checking the CUG supplementary service information for the current call. Refer to +**CCUG** command. If "**;**" is present a **voice** call is performed.
ATD*<gprs_sc> **[*<addr>][*[<L2P>]** **[*[<cid>]]]]#**	This command is specific of GPRS functionality and causes the **MT** to perform whatever actions are necessary to establish communication between the **TE** and the external PDN. Parameters: **<gprs_sc>** - GPRS Service Code, a digit string (value 99) which identifies a request to use the GPRS **<addr>** - string that identifies the called party in the address space applicable to the PDP. **<L2P>** - a string which indicates the layer 2 protocol to be used. For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used: 1 - PPP **<cid>** - a digit which specifies a particular **PDP** context definition (see +**CGDCONT** command).
Example	*To dial a number in SIM phonebook entry 6:* ATD>SM6 OK

D – Dial	
	To have a voice call to the 6-th entry of active phonebook: ATD>6; OK *To call the entry with alphanumeric field "Name":* ATD>"Name"; OK
Reference	V25ter.

5.3.3.2.   Tone Dial - T

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

5.3.3.3.   Pulse Dial - P

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

5.3.3.4.   Answer – A

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

5.3.3.5.   Disconnect - H

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

5.3.3.6.   Return To On Line Mode – O

O - Return To On Line Mode	

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

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

5.3.5.2.　Data Compression Reporting - +DR

+DR - Data Compression Reporting	
AT+DR=<n>	Set command enables/disables the data compression reporting upon connection. Parameter: **<n>** 0 - data compression reporting disabled; 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**:

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

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

3) **AT?** returns the current value of the last S-parameter accessed

Reference: V25ter and RC56D/RC336D

5.3.6.1.   Number Of Rings To Auto Answer - S0

S0 - Number Of Rings To Auto Answer	

ATS0=<n>	Set command sets the number of rings required before device automatically answers an incoming call.
	
	Parameter:
	<n> - number of rings
	  0 - auto answer disabled (factory default)
	  1..255 - number of rings required before automatic answer.

ATS0?	Read command returns the current value of **S0 parameter**.
Reference	V25ter

5.3.6.2.   Ring Counter - S1

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

5.3.6.3.   Command Line Termination Character - S3

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

5.3.6.4.   Response Formatting Character - S4

S4 - Response Formatting Character	

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

5.3.6.5. 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

5.3.6.6. 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

5.3.6.7. 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

5.3.6.8. 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

5.4. 3GPP TS 27.007 AT Commands

5.4.1. General

5.4.1.1. Request Manufacturer Identification - +CGMI

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

5.4.1.2. Request Model Identification - +CGMM

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

5.4.1.3. Request Revision Identification - +CGMR

+CGMR - Request Revision Identification	

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

5.4.1.4. Request Product Serial Number Identification - +CGSN

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

5.4.1.5. Select TE Character Set - +CSCS

+CSCS - Select TE Character Set	

AT+CSCS=
[<chset>]
	Set command sets the current character set used by the device.
	
	Parameter:
	<chset> - character set
	  "GSM" - GSM default alphabet (3GPP TS 03.38/23.008)
	  "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

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

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

5.4.1.7.   Multiplexing Mode - +CMUX

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

5.4.2.   Call Control

5.4.2.1.   Hang Up Call - +CHUP

+CHUP - Hang Up Call	
AT+CHUP	Execution command cancels all active and held calls, also if a multi-party session is running.
AT+CHUP=?	Test command returns the **OK** result code
Reference	GSM 07.07

5.4.2.2.   Select type of address - +CSTA

+CSTA - Select type of address	
AT+CSTA=[<type>]	Set command selects the type of number for further dialing commands (D) according to GSM/UMTS specifications. Parameter: **<type>:** type of address octet in integer format (refer TS 24.008 [8] subclause 10.5.4.7); default 145 when dialing string includes international access code

+CSTA - Select type of address	
	character "+", otherwise 129
AT+CSTA?	Read command returns selected **<type>**
AT+CSTA =?	Test command returns supported **<type>**s
Reference	3GPP TS 27.007

5.4.2.3.   Select Bearer Service Type - +CBST

+CBST - Select Bearer Service Type	

AT+CBST=
[<speed>
[,<name>
[,<ce>]]]
	Set command sets the bearer service **<name>** with data rate **<speed>**, and the connection element **<ce>** to be used when data calls are originated. This setting is also used during mobile terminated data call setup, in case of single numbering scheme calls (refer +CSNS).
	
	Parameters:
	<speed> - data rate
	  0 - autobauding (autobaud)
	  7 - 9600 bps (V.32)
	 12 - 9600 bps (V.34)
	 14 - 14400 bps (V.34)
	 16 - 28800 bps (V.34)
	 17 - 33600 bps (V.34)
	 39 - 9600 bps (V.120)
	 43 - 14400 bps (V.120)
	 48 - 28800 bps (V.120)
	 51 - 56000 bps (V.120)
	 71 - 9600 bps (V.110 or X.31 flag stuffing)
	 75 - 14400 bps (V110 or X.31 flag stuffing)
	 80 - 28800 bps (V110 or X.31 flag stuffing)
	 81 - 38400 bps (V110 or X.31 flag stuffing)
	 83 - 56000 bps (V110 or X.31 flag stuffing)
	 84 - 64000 bps (X.31 flag stuffing)
	 116 - 64000 bps (bit transparent)
	<name> - bearer service name
	 0 - data circuit asynchronous(UDI or 3.1 kHz modem)
	 1 - data circuit synchronous(UDI or 3.1 kHz modem)
	 4 - data circuit asynchronous(RDI)
	<ce> - connection element
	 0 - transparent
	 1 - non transparent (default)
	
	The bearer service on UE910 V2 family only has support for the following combinations:
	
	<GSM network>

+CBST - Select Bearer Service Type	
	AT+CBST= 0,0,1 (Autobaud 9.6k, non transparent)
	AT+CBST= 7,0,1 (V.32 9.6k, non transparent)
	AT+CBST=12,0,1 (V.34 9.6k, non transparent))
	AT+CBST=14,0,1 (V.34 14.4k, non transparent)
	AT+CBST=39,0,1 (V.120 9.6k, non transparent)
	AT+CBST=43,0,1 (V.120 14.4k, non transparent)
	AT+CBST=71,0,1 (V.110 9.6k, non transparent)
	AT+CBST=75,0,1 (V.110 14.4k, non transparent)
	AT+CBST=80,0,1 (V.110 28.8k, non transparent)
	AT+CBST=81,0,1 (V.110 38.4k, non transparent)
	AT+CBST=83,0,1 (X.31FS 56k, non transparent)
	AT+CBST=83,4,1 (X.31FS 56k RDI, non transparent)
	AT+CBST= 7,0,0 (V32 9.6k, transparent)
	<WCDMA network>
	AT+CBST= 0,0,1 (Autobaud 57.6k, non transparent)
	AT+CBST=14,0,1 (V.34 14.4k, non transparent)
	AT+CBST=16,0,1 (V.34 28.8k, non transparent)
	AT+CBST=17,0,1 (V.34 33.6k, non transparent)
	AT+CBST=43,0,1 (V.120 14.4k, non transparent)
	AT+CBST=48,0,1 (V.120 28.8k, non transparent)
	AT+CBST=51,0,1 (V.120 56k, non transparent)
	AT+CBST=75,0,1 (V.110 14.4k, non transparent)
	AT+CBST=80,0,1 (V.110 28.8k, non transparent)
	AT+CBST=81,0,1 (V.110 38.4k, non transparent)
	AT+CBST=83,0,1 (X.31FS 56k, non transparent)
	AT+CBST=83,4,1 (X.31FS 56k RDI, non transparent)
	AT+CBST=84,0,1 (X.31FS 64k, non transparent)
	AT+CBST=116,1,0 (Bit transparent 64 kbps, transparent)
AT+CBST?	Read command returns current value of the parameters **<speed>**, **<name>** and **<ce>**
AT+CBST=?	Test command returns the supported range of values for the parameters.
Reference	3GPP TS 27.007

5.4.2.4.   Radio Link Protocol - +CRLP

+CRLP - Radio Link Protocol	
AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>]]]]]	Set command sets Radio Link Protocol (RLP) parameters used when non-transparent data calls are originated

Parameters:
<iws> - IWF window Dimension
  1..61 - factory default value is 61 (ver 0/1)
  1..488 - factory default value is 240 (ver 2)
<mws> - MS window Dimension
  1..61 - default value is 61 (ver 0/1) |

+CRLP - Radio Link Protocol	

	1..488 - factory default value is 240 (ver 2)
	\<T1\> - acknowledge timer (10 ms units).
	  39..255 - default value is 78 (ver 0 or 1)
	  42..255 – deafault value is 52 (ver 2)
	\<N2\> - retransmission attempts
	  1..255 - default value is 6 (ver 0/1/2)
	\<ver\> - protocol version
	  0..2

AT+CRLP?	Read command returns current settings for each supported RLP version **\<ver\>**. +CRLP : \<iws\>,\<mws\>,\<T1\>,\<N2\> +CRLP : \<iws\>,\<mws\>,\<T1\>,\<N2\>,\<ver\> OK
AT+CRLP=?	Test command returns the range of setting value for each supported RLP version **\<ver\>**.
Reference	3GPP TS 27.007
Note	Versions 0 and 1 share the same parameter set. Read and Test commands shall return only one line for this set (where **\<ver\>** is not present)

5.4.2.5.   Service Reporting Control - +CR

+CR - Service Reporting Control	

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

+CR - Service Reporting Control	
AT+CR?	Read command returns whether or not intermediate result code **+CR** is enabled, in the format: **+CR: <mode>**
AT+CR=?	Test command returns the supported range of values of parameter **<mode>**.
Reference	3GPP TS 27.007

5.4.2.6.   Extended Error Report - +CEER

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

5.4.2.7.   Cellular Result Codes - +CRC

+CRC - Cellular Result Codes	

AT+CRC=
[<mode>]
	Set command controls whether or not the extended format of incoming call indication is used.
	
	Parameter:
	<mode>
	  0 - disables extended format reporting (factory default)
	  1 - enables extended format reporting:
	
	When enabled, an incoming call is indicated to the **TE** with unsolicited result code
	
	+CRING: <type>
	
	instead of the normal **RING**.
	
	where
	<type> - call type:
	  ASYNC - asynchronous transparent data

+CRC - Cellular Result Codes	
	SYNC - synchronous transparent data REL ASYNC - asynchronous non-transparent data REL SYNC - synchronous non-transparent data VOICE - normal voice (TS 11)
AT+CRC?	Read command returns current value of the parameter **<mode>**.
AT+CRC=?	Test command returns supported values of the parameter **<mode>**.
Reference	3GPP TS 27.007

5.4.2.8. Single Numbering Scheme - +CSNS

+CSNS - Single Numbering Scheme	

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

AT+CSNS?	Read command returns current value of the parameter **<mode>**.
AT+CSNS=?	Test command returns supported values of parameter **<mode>**.
Reference	3GPP TS 27.007

5.4.2.9. Voice Hang Up Control - +CVHU

+CVHU - Voice Hang Up Control	

AT+CVHU=
[**<mode>**]
	Set command selects whether **ATH** or "**drop DTR**" shall cause a voice connection to be disconnected or not.
	
	Parameter:
	<mode>
	  0 - "**Drop DTR**" ignored but **OK** result code given. **ATH** disconnects.
	  1 - "**Drop DTR**" and **ATH** ignored but **OK** result code given.
	  2 - "**Drop DTR**" behaviour according to **&D** setting. **ATH** disconnects (factory default).

AT+CVHU?	Read command reports the current value of the **<mode>** parameter, in the format: **+CVHU: <mode>**

+CVHU - Voice Hang Up Control	
AT+CVHU=?	Test command reports the range of supported values for parameter **<mode>**

5.4.3.   Network Service Handling

5.4.3.1.   Subscriber Number - +CNUM

+CNUM - Subscriber Number	

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

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

5.4.3.2.   Read Operator Names - +COPN

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

5.4.3.3.   Network Registration Report - +CREG

+CREG - Network Registration Report	

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

AT+CREG?	Read command reports the **<mode>** and **<stat>** parameter values in the format: **+CREG: <mode>,<stat>[,<Lac>,<Ci>[,<AcT>]]** Note: **<Lac>**, **<Ci>** and **<AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CREG=?	Test command returns the range of supported **<mode>**
Example	AT OK at+creg?

+CREG - Network Registration Report	
	+CREG: 0,2 OK *(the MODULE is in network searching state)* at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,1 OK *(the MODULE is registered)* at+creg? +CREG: 0,1 OK
Reference	3GPP TS 27.007

5.4.3.4.   Operator Selection - +COPS

+COPS - Operator Selection	

AT+COPS=
[<mode>
[,<format>
[,<oper>>[,< AcT>]]]]
	Set command forces an attempt to select and register the GSM\UMTS network operator.
	<mode> parameter defines whether the operator selection is done automatically or it is forced by this command to operator <oper>.
	The operator <oper> shall be given in format <format>.
	
	Parameters:
	<mode>
	  0 - automatic choice (the parameter <oper> will be ignored) (factory default)
	  1 - manual choice (<oper> field shall be present)
	  2 - deregister from the network; the MODULE is kept unregistered until a
	        +COPS with <mode>=**0, 1** or **4** is issued
	  3 - set only <format> parameter (the parameter <oper> will be ignored)
	  4 - manual/automatic (<oper> field shall be present); if manual selection fails,
	        automatic mode (<mode>=**0**) is entered
	<format>
	  0 - alphanumeric long form (max length 16 digits)
	  1 - short format alphanumeric <oper>

+COPS - Operator Selection	

	2 - numeric 5 digits [country code (3) + network code (2)]
	<oper>: network operator in format defined by **<format>** parameter.
	
	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: **< AcT >** parameter setting is never stored in NVM
	
	<AcT> access technology selected:
	  0 GSM
	  2 UTRAN

AT+COPS?	Read command returns current value of **<mode>,<format>,<oper>** and **<AcT>** in format **<format>**; if no operator is selected, **<format>**, **<oper>** and **<AcT>** are omitted **+COPS: <mode>[,<format>,<oper>,< AcT>]**

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

Example	AT+COPS? +COPS: 0,0,"Test PLMN 1-1",0 OK at+cops=? +COPS: (2,"","","45008",2),(1,"Test PLMN 1-1","Test1-

+COPS - Operator Selection	
	1","00101",0),(3,"","","45005",2),,(0-4),(0,2) OK
Reference	3GPP TS 27.007

5.4.3.5.   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 to be used by the **TA**.
	   12 GSM Digital Cellular Systems (GERAN only)
	   22 UTRAN only
	   25 3GPP Systems (both GERAN and UTRAN) (factory default)
	
	 NOTE1: These 3 values are mutually exclusive. e.g. if value "25" is returned, value "12" and "22" shall not be returned.
	 NOTE2: <n> parameter setting is stored in NVM and available at next reboot.

AT+WS46?	Read command reports the currently selected cellular network, in the format: **+ WS46: <n>**
AT+WS46=?	Test command reports the range for the parameter **<n>**.
Reference	3GPP TS 27.007

5.4.3.6.   Facility Lock/Unlock – +CLCK

+CLCK - Facility Lock/Unlock	

AT+CLCK=
 <fac>,<mode>
 [,<passwd>
 [,<class>]]
	Execution command is used to lock or unlock a **ME** or a network facility.
	
	 Parameters:
	 <fac> - facility
	   "SC" - SIM (PIN request) (device asks SIM password at power-up and when this
	        lock command issued)
	   "AO"- BAOC (Barr All Outgoing Calls)
	   "OI" - BOIC (Barr Outgoing International Calls)
	   "OX" - BOIC-exHC (Barr Outgoing International Calls except to Home Country)
	   "AI" - BAIC (Barr All Incoming Calls)
	   "IR" - BIC-Roam (Barr Incoming Calls when Roaming outside the home country)
	   "AB" - All Barring services (applicable only for **<mode>=0**)
	   "AG" - All outGoing barring services (applicable only for **<mode>=0**)
	   "AC" - All inComing barring services (applicable only for **<mode>=0**)
	   "FD" - SIM fixed dialling memory feature (if PIN2 authentication has not been
	        done during the current session, PIN2 is required as **<passwd>**)

+CLCK - Facility Lock/Unlock	
	"PN" - network Personalisation
	"PU" - network subset Personalisation
	"PP" - service Provider Personalization (refer 3GPP TS 22.022 [33])
	"PC" - Corporate Personalization (refer 3GPP TS 22.022 [33])
	"PF" - lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)
	<mode> - defines the operation to be done on the facility
	0 - unlock facility
	1 - lock facility
	2 - query status
	<passwd> - shall be the same as password specified for the facility from the **DTE** user interface or with command Change Password +**CPWD**
	<class> - sum of integers each representing a class of information (default is 7)
	1 - voice (telephony)
	2 - data (refers to all bearer services)
	4 - fax (facsimile services)
	8 - short message service
	16 - data circuit sync
	32 - data circuit async
	64 - dedicated packet access
	128 - dedicated PAD access
	Note: when **<mode>=2** and command successful, it returns:
	+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2> […]]
	where
	<status> - the current status of the facility
	0 - not active
	1 - active
	<class*n*> - class of information of the facility
	Note: The value 4 (facsimile services) of <class> has no effect because FAX does not support. This value is included only for backward compatibility.
AT+CLCK=?	Test command reports all the facilities supported by the device.
Reference	3GPP TS 27.007
Example	*Querying such a facility returns an output on three rows, the first for voice, the second for data, the third for fax:*
	AT+CLCK =”AO”,2
	+CLCK: <status>,1
	+CLCK: <status>,2
	+CLCK: <status>,4

5.4.3.7.   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)
	
	<oldpwd> - string type, it shall be the same as password specified for the facility from the ME user interface or with command +**CPWD**.
	<newpwd> - string type, it is the new password
	
	Note: parameter **<oldpwd>** is the old password while **<newpwd>** is the new one.

AT+CPWD=?	Test command returns a list of pairs (**<fac>**,**<pwdlength>**) which presents the available facilities and the maximum length of their password (**<pwdlength>**)
Example	AT+CPWD=? +CPWD: ("AB",4), ("AC",4), ("AG",4), ("AI",4), ("AO",4), ("IR",4), ("OI",4), ("OX",4), ("SC",8), ("P2",8) , ("PN",8), ("PU",8) , ("PP",8) , ("PC",8) , ("PF",8) OK
Reference	3GPP TS 27.007

5.4.3.8.   Calling Line Identification Presentation - +CLIP

+CLIP - Calling Line Identification Presentation	

AT+CLIP=[<n>]	Set command enables/disables the presentation of the CLI (Calling Line Identity) at the **TE**. This command refers to the UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the CLI of the calling party when receiving a mobile terminated call.
	
	Parameters:
	<n>
	  0 - disables CLI indication (factory default)
	  1 - enables CLI indication
	
	If enabled the device reports after each RING the response:
	
	+CLIP: <number>,<type>,"",128,<alpha>,<CLI_validity>
	
	where:
	<number> - string type phone number of format specified by **<type>**
	<type> - type of address octet in integer format
	  128..255 - refer TS 24.008 subclause 10.5.4.7, where:
	    129 - unknown type of number and ISDN/Telephony numbering plan
	    145 - international type of number and ISDN/Telephony numbering plan
	      (contains the character "+")
	<alpha> - string type; alphanumeric representation of **<number>** corresponding to the entry found in phonebook; used character set should be the one selected with command Select **TE** character set **+CSCS**.
	<CLI_validity>
	  0 - CLI valid
	  1 - CLI has been withheld by the originator.
	  2 - CLI is not available due to interworking problems or limitation or originating network.
	
	Note: in the +**CLIP:** response they are currently not reported either the **subaddress** information (it's always **""** after the 2nd comma) and the **subaddress type** information (it's always **128** after the 3rd comma)

AT+CLIP?	Read command returns the presentation status of the CLI in the format:
	
	+CLIP: <n>,<m>
	where:
	<n>
	  0 - CLI presentation disabled
	  1 - CLI presentation enabled
	<m> - status of the CLIP service on the UMTS network
	  0 - CLIP not provisioned
	  1 - CLIP provisioned
	  2 - unknown (e.g. no network is present)

+CLIP - Calling Line Identification Presentation	
	Note: This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.
AT+CLIP=?	Test command returns the supported values of parameter **<n>**
Reference	3GPP TS 27.007
Note	The command changes only the report behaviour of the device, it does not change CLI supplementary service setting on the network.

5.4.3.9.　Calling Line Identification Restriction - +CLIR

+CLIR - Calling Line Identification Restriction	
AT+CLIR=[<n>]	Set command overrides the CLIR subscription when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. This command refers to CLIR-service (3GPP TS 02.81/21.081) that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call. Parameter: **<n>** - facility status on the Mobile 　0 - CLIR facility according to CLIR service network status 　1 - CLIR facility active (CLI not sent) 　2 - CLIR facility not active (CLI sent)
AT+CLIR?	Read command gives the default adjustment for all outgoing calls (**<n>**) and also triggers an interrogation of the provision status of the CLIR service (**<m>**), where **<n>** - facility status on the Mobile 　0 - CLIR facility according to CLIR service network status 　1 - CLIR facility active (CLI not sent) 　2 - CLIR facility not active (CLI sent) **<m>** - facility status on the Network 　0 - CLIR service not provisioned 　1 - CLIR service provisioned permanently 　2 - unknown (e.g. no network present, etc.) 　3 - CLI temporary mode presentation restricted 　4 - CLI temporary mode presentation allowed
AT+CLIR=?	Test command reports the supported values of parameter **<n>**.
Reference	3GPP TS 27.007
Note	This command sets the default behaviour of the device in outgoing calls.

5.4.3.10.　Connected line identification presentation - COLP

+COLP - Connected line identification presentation	
AT+COLP=[<n>]	Set command enables or disables the presentation of the COL at the TE Parameter: **<n>**

+COLP - Connected line identification presentation	
	0 – disable (factory default) 1 - enable Note: When enabled (and called subscriber allows), +COLP: <number>,<type>[,<subaddr>,<satype> [,<alpha>]] intermediate result code is returned from TA to TE before any +CR or V.25ter [14] responses. It is manufacturer specific if this response is used when normal voice call is established.

AT+COLP?	Read command gives the status of <n>, and also triggers an interrogation of the provision status of the COLP service according 3GPP TS 22.081 [3] (given in <m>).
	
	+COLP: <n>,<m>
	Where,
	<n>
	  0 – disable
	  1 – enable
	<m>
	  0 - COLP not provisioned
	  1 - COLP provisioned
	  2 - unknown (e.g. no network, etc.)

AT+COLP=?	Test command returns supported parameters **<n>**
Reference	3GPP TS 27.007

5.4.3.11. Connected line identification restriction status – +COLR

+COLR - Connected Line Identification Restriction status	

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

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

5.4.3.12.   Call Forwarding Number And Conditions - +CCFC

+CCFC - Call Forwarding Number And Condition	

AT+CCFC=
\<reason\>,
\<cmd\>[,\<number\>[,\<
type\>[,\<class\>
[,,,\<time\>]]]
	Execution command controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.
	
	Parameters:
	\<reason\>
	  0 - unconditional
	  1 - mobile busy
	  2 - no reply
	  3 - not reachable
	  4 - all calls (not with query command)
	  5 - all conditional calls (not with query command)
	
	\<cmd\>
	  0 - disable
	  1 - enable
	  2 - query status
	  3 - registration
	  4 - erasure
	
	\<number\> - string type phone number of forwarding address in format specified by **\<type\>** parameter
	\<type\> - type of address octet in integer format :
	  129 - national numbering scheme
	  145 - international numbering scheme (contains the character "+")
	
	\<class\> - sum of integers each representing a class of information which the command refers to; default 7 (voice + data + fax)
	  1 - voice (telephony)
	  2 - data
	  4 - fax (facsimile services)
	  8 - short message service
	  16 - data circuit sync
	  32 - data circuit async
	  64 - dedicated packet access
	  128 - dedicated PAD access
	
	\<time\> - time in *seconds* to wait before call is forwarded; it is valid only when **\<reason\>** "no reply" is enabled (**\<cmd\>**=1) or queried (**\<cmd\>**=2)
	  1..30 - automatically rounded to a multiple of 5 seconds (default is 20)
	
	Note: when **\<cmd\>=2** and command successful, it returns:
	
	+CCFC: \<status\>,\<class1\>[,\<number\>,\<type\>[,,,\<time\>]][\<CR\>\<LF\>

+CCFC - Call Forwarding Number And Condition	

	+CCFC: <status>,<class2>[,<number>,<type>[,,,<time>]][…]]
	
	 where:
	 <status> - current status of the network service
	   0 - not active
	   1 - active
	 <class*n*> - same as **<class>**
	 <time> - it is returned only when **<reason>**=2 ("no reply") and **<cmd>**=2.
	
	 The other parameters are as seen before.
	
	 Note: The value 4 (facsimile services) of <class> has no effect because FAX does not support. This value is included only for backward compatibility.

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

5.4.3.13. Call Waiting - +CCWA

+CCWA - Call Waiting	

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

+CCWA - Call Waiting	

	+CCWA: <status>,<class2>[…]]
	
	 where
	 <status> represents the status of the service:
	   0 - inactive
	   1 - active
	 <class*n*> - same as **<class>**
	
	 Note: the unsolicited result code enabled by parameter **<n>** is in the format::
	
	 +CCWA: <number>,<type>,<class>,[<alpha>][,<cli_validity>]
	 where:
	 <number> - string type phone number of calling address in format specified by
	           <type>
	 <type> - type of address in integer format
	 <class> - see before
	 <alpha> - string type; alphanumeric representation of **<number>** corresponding to
	      the entry found in phonebook; used character set should be the one
	      selected with **+CSCS**.
	 <cli_validity>
	   0 - CLI valid
	   1 - CLI has been withheld by the originator
	   2 - CLI is not available due to interworking problems or limitations of originating
	     network
	
	 Note: if parameter **<cmd>** is omitted then network is not interrogated.
	
	 Note: in the query command the class parameter must not be issued.
	
	 Note: the difference between call waiting report disabling (**AT+CCWA = 0,1,7**) and call waiting service disabling (**AT+CCWA = 0,0,7**) is that in the first case the call waiting indication is sent to the device by network but this last one does not report it to the **DTE**; instead in the second case the call waiting indication is not generated by the network. Hence the device results busy to the third party in the 2nd case while in the 1st case a ringing indication is sent to the third party.
	
	 Note: The command **AT+CCWA=1,0** has no effect a non sense and must not be issued..
	
	 Note: The value 4 (facsimile services) of <class> has no effect because FAX does not support. This value is included only for backward compatibility.

AT+CCWA?	Read command reports the current value of the parameter **<n>**.
AT+CCWA=?	Test command reports the supported values for the parameter **<n>**.
Reference	3GPP TS 27.007

5.4.3.14.   Call Holding Services - +CHLD

+CHLD - Call Holding Services	

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

AT+CHLD=?	Test command returns the list of supported **<n>s**. **+CHLD: (0,1,1X,2,2X,3,4)**
Reference	3GPP TS 27.007
Note	ONLY for VOICE calls

5.4.3.15.   Call deflection - +CTFR

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

+CTFR - Call deflection	
	<satype> - type of subaddress octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.8); default 128 Note: Call Deflection is only applicable to an incoming voice call
AT+CTFR=?	Test command tests for command existence.

5.4.3.16.   Unstructured Supplementary Service Data - +CUSD

+CUSD - Unstructured Supplementary Service Data	

AT+CUSD= [<n>[,<str> [,<dcs>]]]	Set command allows control of the Unstructured Supplementary Service Data (USSD [3GPP TS 02.90/22.090]).
	
	Parameters:
	<n> - is used to disable/enable the presentation of an unsolicited result code.
	  0 - disable the result code presentation in the **DTA**
	  1 - enable the result code presentation in the **DTA**
	  2 - cancel an ongoing USSD session (not applicable to read command response)
	<str> - USSD-string (when **<str>** parameter is not given, network is not interrogated)
	  - If **<dcs>** indicates that 3GPP TS 3.38/23.038 default alphabet is used **ME/TA** converts GSM alphabet into current TE character set (see +**CSCS**).
	  - If **<dcs>** indicates that 8-bit data coding scheme is used: **ME/TA** converts each 8-bit octet into two IRA character long hexadecimal number; e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65).
	
	<dcs> - 3GPP TS 3.38/23.038 Cell Broadcast Data Coding Scheme in integer format (default is 0).
	
	Note: the unsolicited result code enabled by parameter **<n>** is in the format:
	
	+CUSD: <m>[,<str>,<dcs>] to the TE
	
	where:
	<m>:
	  0 - no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation).
	  1 - further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)
	  2 - USSD terminated by the network
	  3 - other local client has responded
	  4 - operation not supported
	  5 - network time out

AT+CUSD?	Read command reports the current value of the parameter **<n>**
AT+CUSD=?	Test command reports the supported values for the parameter **<n>**
Reference	3GPP TS 27.007

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

5.4.3.17.   Advice Of Charge - +CAOC

+CAOC - Advice Of Charge	

AT+CAOC=
<mode>
	Set command refers to the Advice of Charge supplementary services that enable subscriber to get information about the cost of calls; the command also includes the possibility to enable an unsolicited event reporting of the Current Call Meter (CCM) information.
	
	Parameter:
	<mode>
	  0 - query CCM value
	  1 - disables unsolicited CCM reporting
	  2 - enables unsolicited CCM reporting
	
	Note: the unsolicited result code enabled by parameter **<mode>** is in the format:
	
	+CCCM: <ccm>
	
	where:
	<ccm> - current call meter in home units, string type: three bytes of the CCM value in hexadecimal format (e.g. "00001E" indicates decimal value 30)
	
	Note: the unsolicited result code **+CCCM** is sent when the CCM value changes, but not more than every 10 seconds.

AT+CAOC?	Read command reports the value of parameter **<mode>** in the format: **+CAOC: <mode>**
AT+CAOC=?	Test command reports the supported values for **<mode>** parameter.
Reference	3GPP TS 27.007
Note	**+CAOC** command returns an estimate of the cost of the current call only, produced by the MS and based on the information provided by either AoCI or AOCC supplementary services; it is not stored in the SIM.

5.4.3.18.   List Current Calls - +CLCC

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

+CLCC - List Current Calls	

	\<id*n*\> - call identification number
	\<dir\> - call direction
	  0 - mobile originated call
	  1 - mobile terminated call
	\<stat\> - state of the call
	  0 - active
	  1 - held
	  2 - dialing (**MO** call)
	  3 - alerting (**MO** call)
	  4 - incoming (**MT** call)
	  5 - waiting (**MT** call)
	\<mode\> - call type
	  0 - voice
	  1 - data
	  9 - unknown
	\<mpty\> - multiparty call flag
	  0 - call is not one of multiparty (conference) call parties
	  1 - call is one of multiparty (conference) call parties
	\<number\> - string type phone number in format specified by **\<type\>**
	\<type\> - type of phone number octet in integer format
	  129 - national numbering scheme
	  145 - international numbering scheme (contains the character "+")
	\<alpha\> - string type; alphanumeric representation of **\<number\>** corresponding to the entry found in phonebook; used character set should be the one selected with **+CSCS**.
	
	Note: If no call is active then only **OK** message is sent. This command is useful in conjunction with command +**CHLD** to know the various call status for call holding.

AT+CLCC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.3.19. SS Notification - +CSSN

+CSSN - SS Notification	

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

+CSSN - SS Notification	

	originated call setup, an unsolicited code:
	
	+CSSI: <code1>
	is sent to **TE** before any other **MO** call setup result codes, where:
	<code1>:
	  0 - unconditional call forwarding is active
	  1 - some of the conditional call forwardings are active
	  2 - call has been forwarded
	  3 - call is waiting
	  5 - outgoing calls are barred
	  6 - incoming calls are barred
	
	When **<m>=1** and a supplementary service notification is received during a mobile terminated call setup or during a call, an unsolicited result code:
	
	+CSSU: <code2>
	is sent to **TE**, where:
	<code2>:
	  0 - this is a forwarded call (**MT** call setup)
	  2 - call has been put on hold (during a voice call)
	  3 - call has been retrieved (during a voice call).
	  4 - multiparty call entered (during a voice call)
	  5 - call on hold has been released (this is not a SS notification) (during a voice call)
	  10 - Additional incoming call forwarded

AT+CSSN?	Read command reports the current value of the parameters.
AT+CSSN=?	Test command reports the supported range of values for parameters **<n>**, **<m>**.
Reference	3GPP TS 27.007

5.4.3.20.   Closed User Group Supplementary Service Control - +CCUG

+CCUG - Closed User Group Supplementary Service Control	

AT+CCUG=
[<n>[,<index>
[,<info>]]]
	Set command allows control of the Closed User Group supplementary service [3GPP TS 02.85/22.085].
	
	Parameters:
	<n>
	  0 - disable CUG temporary mode (factory default).
	  1 - enable CUG temporary mode: it enables to control the CUG information on the air interface as a default adjustment for all following outgoing calls.
	<index>
	  0..9 - CUG index
	  10 - no index (preferential CUG taken from subscriber data) (default)
	<info>
	  0 - no information (default)

+CCUG - Closed User Group Supplementary Service Control	
	1 - suppress Outgoing Access (OA) 2 - suppress preferential CUG 3 - suppress OA and preferential CUG
AT+CCUG?	Read command reports the current value of the parameters
AT+CCUG=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.3.21.   Preferred Operator List - +CPOL

+CPOL - Preferred Operator List	

AT+CPOL=
[<index>][,<format>
[,<oper>][,<GSM_Ac
T>,
<GSM_Compact_Ac
T>,
<UTRAN_AcT]]
	Execution command writes an entry in the SIM list of preferred operators.
	
	Parameters:
	<index> - integer type; the order number of operator in the SIM preferred operator list
	  1..*n*
	<format>
	  2 - numeric **<oper>**
	<oper> - string type
	
	<GSM_AcT> - GSM access technology
	   0 – access technology not selected
	   1 – access technology selected
	
	<GSM_Compact_AcT> - GSM compact access technology
	   0 – access technology not selected
	   1 – access technology selected
	
	<UTRAN_AcT> - UTRAN acess technology
	   0 – access technology not selected
	   1 – access technology selected
	
	Note: if **<index>** is given but **<oper>** is left out, entry is deleted. If **<oper>** is given but **<index>** is left out, **<oper>** is put in the next free location. If only **<format>** is given, the format of the **<oper>** in the read command is changed. Currently, **<GSM_Compact_AcT>** is not supported but set value is acceptable.

AT+CPOL?	Read command returns all used entries from the SIM list of preferred operators.
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

5.4.3.22.   Selection of preferred PLMN list – +CPLS

+CPLS - Selection of preferred PLMN list +CPLS	
AT+CPLS=<list>	Set command select one PLMN selector with Access Technology list in the SIM card or active application in the UICC(GSM or USIM), that is used by +CPOL

+CPLS - Selection of preferred PLMN list +CPLS	

	command.
	
	Parameter:
	<list>:
	  0 - User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC) (Default)
	  1- Operator controlled PLMN selector with Access Technology EFOPLMNwAcT
	  2 - HPLMN selector with Access Technology EFHPLMNwAcT

AT+CPLS?	Read command returns the selected PLMN selector list from the SIM/USIM +CPLS: <list>
AT+CPLS =?	Test command returns the whole index range supported lists by the SIM./USIM
Reference	3GPP TS 27.007

5.4.3.23.   Called line identification presentation - +CDIP

+CDIP – Called line identification presentation	

AT+CDIP=[<n>]	This command related to a network service that provides "multiple called numbers (called line identification) service" to an MT. This command enables a called subscriber to get the line identification of the called party when receiving a mobile terminated call. Set command enables or disables the presentation of the called line identifications at the Mobile.
	
	Parameter:
	<n> - parameter sets the result code presentation status to the mobile.
	  0 - disable
	  1 – enable
	
	    +CDIP: "<number>",<type>[,<subaddr>,<satype>]
	
	   <number> - string type of phone number of ormat specified by <type>
	   <type> - type of address octet in interger format (refer TS 24.008 subcaluse 10.5.4.7)
	   Ex) 145(international number), 161(national number), etc.
	   <subaddr> - string type subaddress of format specified by <satype>
	   <satype> - type of subaddress octet in interger format (refer TS 24.008 subclause 10.5.4.8)

AT+CDIP?	Read command gives the status of <n>, and also triggers an interrogation of the provision status of the "multiple called numbers" service. Parameter: **<n>** - parameter shows the result code presentation status to the mobile.

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

AT+CPAS=?	Test command reports the supported range of values for **<pas>**. Note: although +**CPAS** is an execution command, 3gpp TS 27.007 requires the Test command to be defined.
Example	ATD03282131321; OK AT+CPAS +CPAS: 4 *the called phone has answered to your call* OK ATH OK
Reference	3GPP TS 27.007

5.4.4.2.　　Set Phone Functionality - +CFUN

+CFUN - Set Phone Functionality	
AT+CFUN= **[<fun>[,<rst>]]**	Set command selects the level of functionality in the ME. Parameters: **<fun>** - is the power saving function mode 　0 - minimum functionality, NON-CYCLIC SLEEP mode: in this mode, the AT interface is not accessible. Consequently, once you have set **<fun>** level 0, do not send further characters. Otherwise these characters remain in the input buffer and may delay the output of an unsolicited result code. The first wake-up event stops power saving and takes the ME back to full functionality level **<fun>=1**. 　1 - mobile full functionality with power saving disabled (factory default) 　2 - disable TX (Not support) 　4 - disable both TX and RX 　5 - mobile full functionality with power saving enabled **<rst>** - reset flag 　0 - do not reset the ME before setting it to **<fun>** functionality level Note : **AT+CFUN=2** is not supported. Note: URCs and network behavior(incoming calls or SMS) can wake up from CFUN=0 only (there is no way to wake up by TE - RTS no support) Note: issuing **AT+CFUN=4[,0]** actually causes the module to perform either a network deregistration and a SIM deactivation. Note: if power saving enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity. Note: to place the module in power saving mode, set the **<fun>** parameter at value = 5 and the line **DTR** (RS232) must be set to **OFF**. Once in power saving, the **CTS** line switch to the **OFF** status to signal that the module is really in power saving condition. During the power saving condition, before sending any **AT** command on the serial line, the **DTR** must be enabled and it must be waited for the **CTS** (RS232) line to go in **ON** status. Until the **DTR** line is **ON**, the module will not return back in the power saving condition. Note: the power saving function does not affect the network behavior of the MODULE, even during the power save condition the module remains registered on the network and reachable for incoming calls or SMS. If a call incomes during the power save, then the module will wake up and proceed normally with the unsolicited incoming call code

+CFUN - Set Phone Functionality	
	Note: if **AT#ENS=1** then **AT+CFUN=0** has the same functionality of **AT+CFUN=4** (UE910-NA only).
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?** Note: If all parameters are omitted then the behaviour of Set command is the same as Read command.

AT+CPIN?	Read command reports the PIN/PUK/PUK2 request status of the device in the form: **+CPIN: <code>** where: **<code>** - PIN/PUK/PUK2 request status code
	  READY - ME is not pending for any password
	  SIM PIN - ME is waiting SIM PIN to be given
	  SIM PUK - ME is waiting SIM PUK to be given
	  PH-SIM PIN - ME is waiting phone-to-SIM card password to be given
	  PH-FSIM PIN - ME is waiting phone-to-very first SIM card password to be given
	  PH-FSIM PUK - ME is waiting phone-to-very first SIM card unblocking password to be given
	  SIM PIN2 - ME is waiting SIM PIN2 to be given; this **<code>** is returned only when the last executed command resulted in PIN2 authentication failure (i.e. **+CME ERROR: 17**)
	  SIM PUK2 - ME is waiting SIM PUK2 to be given; this **<code>** is returned only when the last executed command resulted in PUK2 authentication failure (i.e. **+CME ERROR: 18**)
	  PH-NET PIN - ME is waiting network personalization password to be given
	  PH-NET PUK - ME is waiting network personalization unblocking password to be

+CPIN - Enter PIN	
	given PH-NETSUB PIN - ME is waiting network subset personalization password to be given PH-NETSUB PUK - ME is waiting network subset personalization unblocking password to be given PH-SP PIN - ME is waiting service provider personalization password to be given PH-SP PUK - ME is waiting service provider personalization unblocking password to be given PH-CORP PIN - ME is waiting corporate personalization password to be given PH-CORP PUK - ME is waiting corporate personalization unblocking password to be given Note: Pin pending status at startup depends on PIN facility setting, to change or query the default power up setting use the command **AT+CLCK=SC,\<mode\>,\<pin\>**
Example	AT+CMEE=1 OK AT+CPIN? +CME ERROR: 10 *error: you have to insert the SIM* AT+CPIN? +CPIN: READY *you inserted the SIM and device is not waiting for PIN to be given* OK
Reference	3GPP TS 27.007

5.4.4.4. Signal Quality - +CSQ

+CSQ - Signal Quality	

AT+CSQ	Execution command reports received signal quality indicators in the form:
	
	+CSQ: \<rssi\>,\<ber\>
	where
	\<rssi\> - received signal strength indication
	  0 - (-113) dBm or less
	  1 - (-111) dBm
	  2..30 - (-109)dBm..(-53)dBm / 2 dBm per step
	  31 - (-51)dBm or greater
	  99 - not known or not detectable
	\<ber\> - bit error rate (in percent)
	  0 - less than 0.2%
	  1 - 0.2% to 0.4%
	  2 - 0.4% to 0.8%
	  3 - 0.8% to 1.6%
	  4 - 1.6% to 3.2%
	  5 - 3.2% to 6.4%
	  6 - 6.4% to 12.8%
	  7 - more than 12.8%
	  99 - not known or not detectable
	
	Note: this command should be used instead of the **%Q** and **%L** commands, since GSM/WCDMA relevant parameters are the radio link ones and no line is present, hence **%Q** and **%L** have no meaning.
	
	Note: in GSM, the received signal strength indication is the average of the received signal level measurement samples in dBm, taken on a channel within the reporting period of length one SACCH multi frame, and is mapped as above.
	For UMTS, the current radio signal strength indicates CPICH RSCP in levels. According to specification 3GPP TS25.133 the level range is from 0 to 91, with
	
	  0 less than (-115) dBm
	  1 (-115) dBm...(-114) dBm
	  .
	  .
	  .
	  91 (-25) dBm or greater
	  99 - not known or not detectable
	
	Values between -115dbm and -120dbm will all be represented by level 0.
	To be compliant with 3GPP TS27.007 specification, the above 0...91 levels are mapped to range 0...31:
	
	  3GPP TS25.133 Level Scaled (displayed) RSSI
	  3 or less 0

+CSQ - Signal Quality	
	4...65 Level /2 - 1 66...91 31 99 99
AT+CSQ=?	Test command returns the supported range of values of the parameters **<rssi>** and **<ber>**. Note: although **+CSQ** is an execution command without parameters, 3GPP TS 27.007 requires the Test command to be defined.
Reference	3GPP TS 27.007

5.4.4.5.   Indicator Control - +CIND

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

AT+CIND=?	Test command returns pairs, where string value <descr> is a description (max. 16 chars) of the indicator and compound value is the supported values for the indicator, in the format:
	
	+CIND: ((<descr>, (list of supported <ind>s))[,(<descr>, (list of supported <ind>s))[,…]])
	
	where:
	<descr> - indicator names as follows (along with their <ind> ranges)
	  "battchg" - battery charge level
	    <ind> - battery charge level indicator range
	      0..5
	      99 - not measurable
	  "signal" - signal quality
	    <ind> - signal quality indicator range
	      0..7
	      99 - not measurable
	  "service" - service availability
	    <ind> - service availability indicator range
	      0 - not registered to any network
	      1 - registered
	  "sounder" - sounder activity
	    <ind> - sounder activity indicator range
	      0 - there's no any sound activity
	      1 - there's some sound activity

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

5.4.4.6. Mobile Equipment Event Reporting - +CMER

+CMER - Mobile Equipment Event Reporting	SELINT 2
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. 1 - discard +**CIEV** Unsolicited Result Codes when TA-TE link is reserved (e.g. on-line data mode); otherwise forward them directly to the TE.

+CMER - Mobile Equipment Event Reporting		SELINT 2
	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	
	2 - indicator event reporting	
	<bfr> - TA buffer clearing	
	0 - TA buffer of unsolicited result codes is cleared when <mode> 1..3 is entered	
	1 - TA buffer of unsolicited result codes is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes)	
	Note: After AT+CMER has been switched on with e.g. AT+CMER=2,0,0,2 command (i.e. <bfr> is 0), URCs for all registered indicators will be issued only first time, if previous <mode> was 0, for backward compatibility. Values shown by the indicators will be current indicators values, not buffered ones. Subsequent AT+CMER commands with <mode> different from 0 and <bfr> equal to 0 will not flush the codes, even if <mode> was set again to 0 before. To flush the codes, <bfr> must be set to 1.	
	Although it is possible to issue the command when SIM PIN is pending, it will answer ERROR if "message" or "smsfull" indicators are enabled in AT+CIND, because with pending PIN it is not possible to give a correct indication about SMS status. To issue the command when SIM PIN is pending you have to disable "message" and "smsfull" indicators in AT+CIND first.	
AT+CMER?	Read command returns the current setting of parameters, in the format: **+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>**	
AT+CMER=?	Test command returns the range of supported values for parameters **<mode>, <keyp>, <disp>, <ind>, <bfr>**, in the format: **+CMER: (list of supported <mode>s),(list of supported <keyp>s), (list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s)**	
Reference	3GPP TS 27.007	

5.4.4.7.   Select Phonebook Memory Storage - +CPBS

+CPBS - Select Phonebook Memory Storage	

AT+CPBS= <storage>	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/+CPBW is not applicable for this storage)
	  "MC" - device missed (unanswered received) calls list (+CPBF is not applicable for this storage)
	  "RC" - ME received calls list (+CPBF is not applicable for this storage).
	  "MB" - mailbox numbers stored on SIM; it is possible to select this storage only if the mailbox service is provided by the SIM (see #MBN).
	  "DC" - MT dialled calls list
	  "ME" - MT phonebook
	  "EN" - SIM/USIM (or MT) emergency number (+CPBW is not be applicable for this storage)
	  "ON" - SIM (or MT) own numbers (MSI torage may be available through +CNUM also).
	  "SD" - SIM Service Dialling Numbers (SDN) phonebook (+CPBW is not applicable for this storage).
	
	<password>: string type value representing the PIN2-code required when selecting PIN2-code locked <storage> above "FD
	
	Note: If **"SM"** is the currently selected phonebook, selecting**"FD"** phonebook with ''**AT+CPBS="FD"**'' command simply selects the FDN as the phonebook upon which all subsequent +**CPBW,** +**CPBF** and +**CPBR** commands act; the command does not deactivate ''SM'' phonebook, and does not activate FDN
	
	Note: if **<password>** parameter is given, PIN2 will be verified, even if it is not required, i.e. it has already been inserted and verified during current session

AT+CPBS?	Read command returns the actual values of the parameter **<storage>**, the number of occupied records **<used>** and the maximum index number **<total>**, in the format: **+CPBS: <storage>,<used>,<total>** Note: For **<storage>="MC"**: if there are more than one missed calls from the same number the read command will return only the last call.
AT+CPBS=?	Test command returns the supported range of values for the parameters **<storage>**.
Example	AT+CPBS="SM" *current phonebook storage is SIM* AT+CPBR=1 +CPBR: 1,"0105872928",129,"James"

+CPBS - Select Phonebook Memory Storage	
	OK
Reference	3GPP TS 27.007

5.4.4.8.   Read Phonebook Entries - +CPBR

+CPBR - Read Phonebook Entries	

AT+CPBR=
 <index1>
 [,<index2>]
	Execution command returns phonebook entries in location number range **<index1>**..**<index2>** from the current phonebook memory storage selected with **+CPBS**. If **<index2>** is omitted, only location **<index1>** is returned.
	
	 Parameters:
	 <index1> - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**).
	 <index2> - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**).
	
	 The response format is:
	 [+CPBR:
	 <index1>,**<number>**,**<type>**,**<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]] **[<CR><LF>**
	 +CPBR:
	 <index2>,**<number>**,**<type>**,**<text>**[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]] **[…]]]**
	
	 where:
	 <index*n*> - the location number of the phonebook entry
	 <number> - string type phone number of format **<type>**
	 <type> - type of phone number octet in integer format
	   129 - national numbering scheme
	   145 - international numbering scheme (contains the character "+")
	 <text> - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS.**
	     <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
	
	     <adnumber>: additional number ; string type phone number of format <adtype>
	
	     <adtype>: type of address octet in integer format
	
	     <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
	
	 <email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
	     <hidden>: indicates if the entry is hidden or not

+CPBR - Read Phonebook Entries	
	<u>0</u>: 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>
	   <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

+CPBR - Read Phonebook Entries	
	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.**
	
	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

+CPBF - Find Phonebook Entries	

	address; character set as specified by command Select TE Character Set +CSCS
	    <hidden>: indicates if the entry is hidden or not
	     0: phonebook entry not hidden
	 1: phonebook entry hidden
	
	 Note: **+CPBF** is not applicable if the current selected storage (see **+CPBS**) is either "MC", either "RC" or "LD".
	
	 Note: if **<findtext>=""** the command returns all the phonebook records.
	
	 Note: if no PB records satisfy the search criteria then an **ERROR** message is reported.

AT+CPBF=?	Test command reports the maximum lengths of **<number>** and **<text>** fields, in the format:
	
	 +CPBF:
	        <nlength>,<tlength>,<glength>,<slength>,<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:
	   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
	   1. 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
Reference	3GPP TS 27.007

5.4.4.10. Write Phonebook Entry - +CPBW

+CPBW - Write Phonebook Entry	

AT+CPBW=
[<index>]
[,<number> [,<type>
[,<text>[,<group>[,<ad
number>[,<adtype>[,<
secondtext>[,<email>[,
<hidden>]]]]]]]]]]
	Execution command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with **+CPBS**.
	
	Parameters:
	<index> - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**).
	<number> - string type, phone number in the format **<type>**
	<type> - the type of number
	  129 - national numbering scheme
	  145 - international numbering scheme (contains the character "+")
	<text> - the text associated to the number, string type; used character set should be the one selected with command +**CSCS**.
	   <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
	
	   <adnumber>: additional number ; string type phone number of format <adtype>
	
	   <adtype>: type of address octet in integer format
	
	   <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
	
	<email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
	   <hidden>: indicates if the entry is hidden or not
	      <u>0</u>: 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

+CPBW - Write Phonebook Entry	
	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. Note: before defining <group> string, it is recommended to check, with **#CPBGR** command, the predefined group names, that could be already stored in USIM in Grouping information Alpha String (GAS) file. If all records in such file are already occupied, **+CPBW** command will return **ERROR** when trying to use a new group name that is not in the predefined GAS names. To define a new custom group string, it is necessary to overwrite with it one of the old predefined strings, using **#CPBGW** command.

AT+CPBW=?	Test command returns location range supported by the current storage as a compound value, the maximum length of **<number>** field, supported number format of the storage and maximum length of **<text>** field. The format is:
	
	 +CPBW: (list of supported <index>s),<nlength>,
	 (list of supported
	 <type>s),<tlength>>,`<glength>`,`<slength>`,`<elength>`
	
	 where:
	 <nlength> - integer type value indicating the maximum length of field
	       <number>.
	 <tlength> - integer type value indicating the maximum length of field **<text>**
	     <glength>: integer type value indicating the maximum length of field <group>
	     <slength>: integer type value indicating the maximum length of field
	     <secondtext>
	     <elength>: integer type value indicating the maximum length of field <email>
	
	 Note: the value of **<nlength>** could vary, depending on the availability of Extension service, in the following situations:
	   1. if "SM" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension1** service
	   2. if "FD" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension2** service
	   3. if "MB" memory storage has been selected (see **+CPBS**) and the **SIM** supports the **Extension6** service

Reference	3GPP TS 27.007
Example	AT+CPBW=? +CPBW: (1-100),40,(129, 145),255 OK AT+CPBW=6,"18651896699",129,"John"

+CPBW - Write Phonebook Entry	
	OK
Note	Remember to select the PB storage with +**CPBS** command before issuing PB commands.

5.4.4.11.   Read Group Entries - #CPBGR

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

5.4.4.12.   Write Group Entries - #CPBGW

#CPBGW - Write Group Entry	
AT#CPBGW= **<index>,<text>**	Execution command writes Grouping information Alpha String (GAS) USIM file entry in location number **<index>**. Parameters: **<index>** - integer type, value in the range of location numbers of the GAS file. **<text>** - the text associated to the entry, string type Note: If record number **<index>** already exists, it will be overwritten.
AT#CPBGW=?	Test command returns location range supported by the current storage as a

#CPBGW - Write Group Entry	
	compound value, and maximum length of **<text>** field. The format is: **+CPBGW: (list of supported <index>s),<tlength>** where: **<tlength>** - integer type value indicating the maximum length of field **<text> in bytes; actual maximum number of characters that can be stored depends upon <text> coding (see +CSCS)**

5.4.4.13. Clock Management - +CCLK

+CCLK - Clock Management	

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

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

5.4.4.14. Alarm Management - +CALA

+CALA - Alarm Management	

+CALA - Alarm Management	

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

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

5.4.4.15.   Delete Alarm - +CALD

+CALD - Delete Alarm

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

5.4.4.16.   Postpone alarm - +CAPD

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

5.4.4.17.   Alarm Pin - #ALARMPIN

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

5.4.4.18.   Setting date format - +CSDF

+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 HE910

+CSDF – setting date format	
	AT Commands Reference Guide 80378ST10091A Rev. 4 – 2012-07-02 Reproduction forbidden without Telit Communications S.p.A. written authorization - All Rights Reserved page 94 of 349 Mod. 0808 2011-07 Rev.2 specified by use of the **<auxmode>** parameter (i.e., the <auxmode> affects the **<time>** of AT+CCLK and AT+CALA). If the parameters are omitted then this sets the default value of **<mode>**. Parameters: **<mode>:** 1 DD-MMM-YYYY (default) 2 DD-MM-YY 3 MM/DD/YY 4 DD/MM/YY 5 DD.MM.YY 6 YYMMDD 7 YY-MM-DD **<auxmode>**: 1 yy/MM/dd (default) 2 yyyy/MM/dd Note: The **<time>** format of +CCLK and +CALA is "yy/MM/dd,hh:mm:ss+zz" when **<auxmode>**=1 and it is "yyyy/MM/dd,hh:mm:ss+zz" when **<auxmode>**=2.
AT+CSDF?	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>**

5.4.4.19.   Setting time format - +CSTF

+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>**

+CSTF – setting time format	
AT+CSTF=?	Test command reports the supported range of values for parameter **<mode>**

5.4.4.20.   Time Zone reporting - +CTZR

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

5.4.4.21.   Automatic Time Zone update - +CTZU

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

5.4.4.22.   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:

+CRSM - Restricted SIM Access	
	<command> - command passed on by the **ME** to the SIM 176 - READ BINARY 178 - READ RECORD 192 - GET RESPONSE 214 - UPDATE BINARY 220 - UPDATE RECORD 242 - STATUS **<fileid>** - identifier of an elementary data file on SIM. Mandatory for every command except STATUS. **<P1>,<P2>,<P3>** - parameter passed on by the **ME** to the SIM; they are mandatory for every command except GET RESPONSE and STATUS 0..255 **<data>** - information to be read/written to the SIM (hexadecimal character format). **< pathid>** - string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format. The <pathid> shall only be used in the mode "select by path from MF" (e.g. "7F205F70"). The response of the command is in the format: **+CRSM: <sw1>,<sw2>[,<response>]** where: **<sw1>,<sw2>** - information from the SIM about the execution of the actual command either on successful or on failed execution. **<response>** - on a successful completion of the command previously issued it gives the requested data (hexadecimal character format). It's not returned after a successful UPDATE BINARY or UPDATE RECORD command. Note: this command requires PIN authentication. However commands READ BINARY and READ RECORD can be issued before PIN authentication and if the SIM is blocked (after three failed PIN authentication attempts) to access the contents of the Elementary Files. Note: use only decimal numbers for parameters **<command>**, **<fileid>**, **<P1>**, **<P2>** and **<P3>**.
AT+CRSM=?	Test command returns the **OK** result code
Example	*Read binary, ICCID(2FE2)* *AT+CRSM=176,12258,0,0,10* *+CRSM: 144,0,9828507020011107686F4* *OK* *Read record, ADN(6F3A)*

+CRSM - Restricted SIM Access

	AT+CRSM=178,28474,1,4,40 *+CRSM: 144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFFFF0681105678* *9282FFFFFFFFFFFFFFFF* *OK* *Update Binary, KcGPRS(6F52)* *AT+CRSM=214,28539,0,0,8,C69018C7958C87* *+CRSM: 144,0* *OK* *Update Record, ADN(6F3A)* *AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF* *FFFFFFFFFFFFFFFFFFFFFFFFFFFF* *+CRSM: 144,0* *OK* *Status, FPLMN(6F7B)* *AT+CRSM=242,28539* *+CRSM: 144,0,623C820238218410A0000000871002FFFFFFFF8904* *0300FFA5118001318103010A3282011E8304000030E08A01058B032F0609C6099* *001C0830101830181* *OK* *Get Response, MSISDN(6F40)* *AT+CRSM=192,28480,4,0,4,,7F106F40* *+CRSM:* *144,0,621E8205422100260283026F40A5039201008A01058B036F06058002004C* *8800* *OK*
Reference	3GPP TS 27.007, 3GPP TS 11.11/51.011

5.4.4.23. Generic SIM Acess - +CSIM

+CSIM – Generic SIM Access

AT+CSIM=<length>,<command>	This command allows a direct control of the SIM by a distant application on the TE Set command transmits to the MT the <command> it then shall send as it is to the SIM The <response> is Returned in the same manner to the TE Parameters:

+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
AT+CSIM=?	Test command returns the OK result code.
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011

5.4.4.24.   Alert Sound Mode - +CALM

+CALM - Alert Sound Mode	

AT+CALM=
\<mode\>
	Set command is used to select the general alert sound mode of the device.
	
	 Parameter:
	\<mode\>
	  0 - normal mode
	  1 - silent mode; no sound will be generated by the device, except for alarm sound
	  2 - stealth mode; no sound will be generated by the device
	
	 Note: if silent mode is selected then incoming calls will not produce alerting sounds but only the unsolicited messages **RING** or **+CRING**.

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

5.4.4.25.   Ringer Sound Level - +CRSL

+CRSL - Ringer Sound Level	

AT+CRSL=\<level\>	Set command is used to select the incoming call ringer sound level of the device.
	
	 Parameter:
	\<level\> - ringer sound level
	  0 - Off
	  1 - low
	  2 - middle
	  3 - high
	  4 - progressive

AT+CRSL?	Read command reports the current **\<level\>** setting of the call ringer in the format:

+CRSL - Ringer Sound Level	
	+CRSL: <level>
AT+CRSL=?	Test command reports <level> supported values as compound value. +CRSL: (0-4)
Reference	3GPP TS 27.007

5.4.4.26.   Loudspeaker Volume Level - +CLVL

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

5.4.4.27.   Microphone Mute Control - +CMUT

+CMUT - Microphone Mute Control	

AT+CMUT=<n>	Set command enables/disables the muting of the microphone audio line during a voice call.
	
	Parameter:
	<n>
	  0 - mute off, microphone active (factory default)
	  1 - mute on, microphone muted.
	
	Note: this command mutes/activates both microphone audio paths, internal mic and external mic.

AT+CMUT?	Read command reports whether the muting of the microphone audio line during a voice call is enabled or not, in the format: +CMUT: <n>
AT+CMUT=?	Test command reports the supported values for <n> parameter.
Reference	3GPP TS 27.007

5.4.4.28.   Silence command - +CSIL

+CSIL – silence command	

AT+CSIL=[<mode>]	This command enables/disables the silent mode. When the phone is in silent mode,all signalling tones from MT are suppressed.
	
	Parameter:
	<mode>
	  0 – Silent mode off (factory default)
	  1 – Silent mode on

AT+ CSIL?	Read command returns the current setting: **+CSIL : <mode>**
AT+ CSIL =?	Test command reports the range of supported values for **<mode>** parameter.

5.4.4.29.   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

5.4.4.30.   Accumulated Call Meter Maximum - +CAMM

+CAMM - Accumulated Call Meter Maximum	
AT+CAMM= [<acmmax>	Set command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax). This value represents the maximum number of

+CAMM - Accumulated Call Meter Maximum	
[,<pwd>]]	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

5.4.4.31.   Price per Unit and Currency Table - +CPUC

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

5.4.4.32.   Set voice mail number - +CSVM

+CSVM – Set Voice Mail Number	

AT+CSVM=<mode>[,<number>[,<type>]]	The number to the voice mail server is set with this command. The parameters <number> and <type> can be left out if the parameter <mode> is set to 0.
	Parameters:
	<mode>
	  0 – disable the voice mail number
	  1 – enable the voice mail number (factory default)
	<number> - string type phone number of format specified by **<type>**
	<type> - type of address octet in integer format
	  129 - unknown type of number and ISDN/Telephony numbering plan
	  145 - international type of number and ISDN/Telephony numbering plan (contains the character "+")

AT+CSVM?	Read command returns the currently selected voice mail number and the status (i.e. enabled/disabled) in the format **+CSVM:<mode>,<number>,<type>**
AT+CSVM=?	Test command reports the range for the parameters **<mode>** and **<type>**.

5.4.4.33.   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

5.4.4.34.   Call Meter maximum event - +CCWE

+CCWE – Call Meter maximum event	

AT+CCWE=<mode>	Set command is used to enable/disable sending of an unsolicited result code +CCWV shortly before the ACM (Accumulated Call Meter) maximum value is reached. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 seconds call time remains.
	
	Parameter:
	<mode>
	  0 - disable the call meter warning event (factory default)
	  1 - enable call meter warning event
	
	Note: the set command will respond with an error if the Accumulated Call Meter service is not active in SIM

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

5.4.4.35.   Enhanced Network Selection - #ENS

#ENS – Enhanced Network Selection	

AT#ENS=[<mode>]	Set command is used to activate the ENS functionality
	
	Parameter:
	<mode>
	0 – disable ENS functionality (default)
	1 – enable ENS functionality; If AT#ENS=1 has been issued the following values will be automatically set:
	  a GSM QUAD enabled (AT#BND=5, Except for UE910-EU and UE910-NA)
	  b SIM Application Toolkit enabled on user interface 0 if not previously enabled on a different user interface (AT#STIA=2)
	  c PLMN list not fixed (AT#PLMNMODE=1)
	
	Note : AT#BND=0 with UE910-EU and AT#BND=3 with UE910-NA when AT#ENS set to 1.

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

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

#EONS - Enable URC of Enhanced Operator Name String	

AT#EONS=<ena>	Set command enables URC & feature of EONS.
	
	Parameter
	<ena>:
	  0 - Disable URC & Feature of EONS
	  1 - Enable URC & Feature of EONS
	
	   #EONS: <net>

#EONS - Enable URC of Enhanced Operator Name String	
	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>**.

5.4.4.37.　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 the UICC, which is attached to ME. Parameter **<dfname>**: all selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes. ** +CCHO: <sessionid>** where: <sessionid > : A session ID to be used in order to target a specific application. It is to be used when sending commands with +CGLA commands.
AT+CCHO=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.38.　Close Logical Channel - +CCHC

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

+CCHC – Close Logical Channel	
	Parameter **< sessionid >**: A session ID to be used in order to target a specific application.
AT+CCHC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.4.4.39.   Generic UICC Logical Channel Access - +CGLA

+CGLA – Generic UICC Logical Channel Access	
AT+CGLA=<sessionid>,<length>,<command>	This command allows a direct control of the UICC by a distant application on the TE. Set command transmits to the MT the <command> it then shall send as it is to the UICC The <response> is Returned in the same manner to the TE Parameters: <**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 manadatory in order to send commands to the UICC when targeting applications on the UICC using a logical channel other than the default channel (channel "0"). <**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: **+CGLA**: <**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 UICC to the MT
AT+CGLA=?	Test command returns the OK result code.
Reference	3GPP TS 27.007, 3GPP TS 11.11/31.102/51.011

5.4.4.40.   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

+CUAD – UICC Application Discovery	
	content of the EF$_{DIR}$
AT+CUAD=?	Test command returns the OK result code.
Reference	3GPP TS 27.007

5.4.4.41.   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>][…]] 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.
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*" +CPINR: PH-FSIM PIN,10,10 +CPINR: PH-FSIM PUK,32,32 OK
Reference	3GPP TS 27.007

5.4.5.   Mobile Equipment Errors

5.4.5.1.   Report Mobile Equipment Error - +CMEE

+CMEE - Report Mobile Equipment Error	

+CMEE - Report Mobile Equipment Error	

AT+CMEE=[<n>]	Set command enables/disables the report of result code:
	
	+CME ERROR: <err>
	
	as an indication of an error relating to the +**Cxxx** commands issued.
	
	When enabled, device related errors cause the +**CME ERROR: <err>** final result code instead of the default **ERROR** final result code. **ERROR** is anyway returned normally when the error message is related to syntax, invalid parameters, or **DTE** functionality.
	
	Parameter:
	<n> - enable flag
	  0 - disable +**CME ERROR:<err>** reports, use only **ERROR** report.
	  1 - enable +**CME ERROR:<err>** reports, with **<err>** in numeric format
	  2 - enable +**CME ERROR: <err>** reports, with **<err>** in verbose format

AT+CMEE?	Read command returns the current value of subparameter **<n>**: **+CMEE: <n>**
AT+CMEE=?	Test command returns the range of values for subparameter **<n>**
Note	+**CMEE** has no effect on the final result code +**CMS**
Reference	3GPP TS 27.007

5.4.6.   Voice Control

5.4.6.1.   DTMF Tones Transmission - +VTS

+VTS - DTMF Tones Transmission	
AT+VTS= <dtmfstring> [,duration]	Execution command allows the transmission of DTMF tones. Parameters: **<dtmfstring>** - string of **<dtmf>s,** i.e. ASCII characters in the set **(0-9), #,*,(A-D),P**; the string can be at most 255 **<dtmf>s** long; it allows the user to send a sequence of DTMF tones, each of them with a duration that was defined through **+VTD** command. **<duration>** - duration of a tone in 1/100 sec.; this parameter can be specified only if the length of first parameter is just one ASCII character 0 - a single DTMF tone will be transmitted for a duration depending on the network, no matter what the current **+VTD** setting is. 1..255 - a single DTMF tone will be transmitted for a time **<duration>** (in 10 ms multiples), no matter what the current **+VTD** setting is. Note: this commands operates in voice mode only (see **+FCLASS**). Note: the character P does not correspond to any DTMF tone, but it is interpreted as a pause of 3 seconds between the preceding and succeeding DTMF string elements
AT+VTS=?	Test command provides the list of supported **<dtmf>s** and the list of supported **<duration>s** in the format: **(list of supported <dtmf>s)[,(list of supported <duration>s)]**
Reference	3GPP TS 27.007 and TIA IS-101

5.4.6.2.   Tone Duration - +VTD

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

5.4.7.　　Commands For GPRS

5.4.7.1.　　GPRS Mobile Station Class - +CGCLASS

+CGCLASS - GPRS mobile station class	
AT+CGCLASS= [<class>]	Set command sets the GPRS class according to **<class>** parameter. Parameter: **<class>** - GPRS class 　"A" - WCDMA (factory default) 　"B" - GSM/GPRS 　"CG" - class C in GPRS only mode (GPRS only) 　"CC" - class C in circuit switched only mode (GSM only) Note: the setting is saved in NVM (and available on following reboot).
AT+CGCLASS?	Read command returns the current value of the GPRS class in the format: **+CGLASS: <class>**
AT+CGCLASS=?	Test command reports the range for the parameter **<class>**

5.4.7.2.　　GPRS Attach Or Detach - +CGATT

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

5.4.7.3.   GPRS Event Reporting - +CGEREP

+CGEREP - GPRS Event Reporting	

AT+CGEREP= [<mode>[,<bfr>]]	Set command enables or disables sending of unsolicited result codes +CGEV: XXX (see below) from **TA** to **TE** in the case of certain events occurring in the **TA** or the network.
	
	Parameters:
	<mode> - controls the processing of **URCs** specified with this command
	  0 - Buffer unsolicited result codes in the **TA**. If **TA** result code buffer is full, the oldest one can be discarded. No codes are forwarded to the **TE**.
	  1 - Discard unsolicited result codes when **TA-TE** link is reserved (e.g. in on-line data mode); otherwise forward them directly to the **TE**.
	  2 - Buffer unsolicited result codes in the **TA** when **TA-TE** link is reserved (e.g. in on-line data mode) and flush them to the **TE** when **TA-TE** link becomes available; otherwise forward them directly to the **TE**.
	<bfr> - controls the effect on buffered codes when **<mode> 1** or **2** is entered:
	  0 - **TA** buffer of unsolicited result codes defined within this command is cleared when **<mode>=1** or **2** is entered.
	  1 - **TA** buffer of unsolicited result codes defined within this command is flushed to the **TE** when **<mode>=1** or **2** is entered (**OK** response shall be given before flushing the codes)
	
	Unsolicited Result Codes
	The following unsolicited result codes and the corresponding events are defined:
	
	+CGEV: REJECT <PDP_type>, <PDP_addr>
	    A network request for PDP context activation occurred when the **TA** was unable to report it to the **TE** with a +**CRING** unsolicited result code and was automatically rejected
	
	+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]
	    The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to **TA**
	
	+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]
	    The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to **TA**
	
	+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]
	    The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to **TA**
	
	+CGEV: NW DETACH
	    The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately

+CGEREP - GPRS Event Reporting	

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

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

5.4.7.4.   GPRS Network Registration Status - +CGREG

+CGREG - GPRS Network Registration Status	

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

+CGREG - GPRS Network Registration Status	
	Note: **<lac>, <Ci>, <AcT>** and **<rac>** are reported only if **<mode>=2** and the mobile is registered on some network cell.
AT+CGREG=?	Test command returns supported values for parameter **<n>**
Reference	3GPP TS 27.007

5.4.7.5.   Define PDP Context - +CGDCONT

+CGDCONT - Define PDP Context	

AT+CGDCONT= **[<cid>** **[,<PDP_type>** **[,<APN>** **[,<PDP_addr>** **[,<d_comp>** **[,<h_comp>** **[,<pd1>** **[,…[,pdN]]]]]]]]]**	Set command specifies 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
	<APN> - (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.
	<PDP_addr> - a string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the **+CGPADDR** command.
	<d_comp> - numeric parameter that controls PDP data compression
	  0 - off (default if value is omitted)
	  1 – on
	  2 - V.42bis
	<h_comp> - numeric parameter that controls PDP header compression
	  0 - off (default if value is omitted)
	  1 – on
	  2 - RFC1144 (applicable for SNDCP only)
	  3- RFC2507
	<pd1>, …, **<pdN>** - zero to N string parameters whose meanings are specific to the **<PDP_type>**
	
	Note: a special form of the Set command, **+CGDCONT=<cid>**, causes the values for context number **<cid>** to become undefined.

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>[,<pd1>[,…[,pdN]]][<CR><LF>+CGDCONT: <cid>,** **<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>** **[,<pd1>[,…[,pdN]]][…]]**
AT+CGDCONT=?	Test command returns values supported as a compound value
Example	AT+CGDCONT=1,"IP",*"APN"*,"10.10.10.10",0,0 OK

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

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

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

+CGQMIN - Quality Of Service Profile (Minimum Acceptable)	
Example	AT+CGQMIN=1,0,0,3,0,0 OK AT+CGQMIN? +CGQMIN: 1,0,0,5,0,0 OK AT+CGQMIN=? +CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQMIN: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

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

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

+CGQREQ - Quality Of Service Profile (Requested)	
Example	AT+CGQREQ? +CGQREQ: 1,0,0,3,0,0 OK AT+CGQREQ=1,0,0,3,0,0 OK AT+CGQREQ=? +CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) +CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060

5.4.7.8.   3G Quality Of Service Profile (Requested) - +CGEQREQ

+CGEQREQ – 3G Quality Of Service Profile (Requested)	

AT+CGEQREQ= [<cid> [,<Traffic class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority>[,<Source statistics descriptor> [,<Signalling indication>]]]]]]]]]]]]]]]]	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network.
	
	Parameters:
	<cid> - PDP context identification (see **+CGDCONT** command).
	<Traffic class> - Traffic class
	  0 - conversational
	  1 - streaming
	  2 - interactive
	  3 - background
	  4 - subscribed value
	
	<Maximum bitrate UL> - Maximum bitrate Up Link (kbits/s)
	  0 - subscribed value
	  1…384
	
	<Maximum bitrate DL> - Maximum bitrate down link (kbits/s)
	  0 - subscribed value
	  1…568
	  576…7168
	
	<Guaranteed bitrate UL> - the guaranteed bitrate up link(kbits/s)
	  0 - subscribed value
	  1…384
	
	<Guaranteed bitrate DL> - the guaranteed bitrate down link(kbits/s)
	  0 - subscribed value
	  1…568
	  576…7168
	
	<Delivery order> SDU Delivery oreder
	  0 - no
	  1 - yes
	  2 - subscribed value
	
	<Maximum SDU size> Maximum SDU size in octets
	  0 - subscribed value
	  10…1500
	  1502
	  1510
	  1520
	
	<SDU error ratio> SDU error ratio

+CGEQREQ – 3G Quality Of Service Profile (Requested)

- mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$
 "0E0"
 "1E1"
 "1E2"
 "7E3"
 "1E3"
 "1E4"
 "1E5"
 "1E6"
 	
 \<Residual bit error ratio\> Residual bitt error ratio
 - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$
 "0E0"
 "5E2"
 "1E2"
 "5E3"
 "4E3"
 "1E3"
 "1E4"
 "1E5"
 "1E6"
 "6E8"
 	
 \<Delivery of erroneous SDUs\> Delivery of erroneous SDUs
    0   - no
    1   – yes
    2   – no detect
    3   – subscribed value
 	
 \<Transfer delay \> Transfer delay (milliseconds)
    0 – subscribed value
    10-150
    200-950
    1000-4000
 	
 \<Traffic handling priority \> Traffic handling priority
    0-   subscribed 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.

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	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.
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>]** **[+CGEQMIN:…]** If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGEQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQREQ: <PDP_Type>,(list of supported <Traffic class>s),** **(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s) ,(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",0,0,0,0,0 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),(0-384),(0-568,576-7168),(0-384),(0-568,576-7168),(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),(0-384),(0-568,576-7168),(0-384),(0-568,576-7168),(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-

+CGEQREQ – 3G Quality Of Service Profile (Requested)	
	950,1000-4000),(0-3),(0-1),(0-1) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.7.9.   3G Quality Of Service Profile (Minimum Acceptable) - +CGEQMIN

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

AT+CGEQMIN=
[<**cid**>
[,<**Traffic class**>
[,<**Maximum bitrate UL**>
[,<**Maximum bitrate DL**>
[,<**Guaranteed bitrate UL**>
[,<**Guaranteed bitrate DL**>
[,<**Delivery order**>
[,<**Maximum SDU size**>
[,<**SDU error ratio**>
[,<**Residual bit error ratio**>
[,<**Delivery of erroneous SDUs**>
[,<**Transfer delay**>
[,<**Traffic handling priority**>[,<**Source statistics descriptor**>
[,<**Signalling indication**>]]]]]]]]]]]]]]]
	Set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept Message.
	
	Parameters:
	<cid> - PDP context identification (see +**CGDCONT** command).
	<Traffic class> - Traffic class
	    0 - conversational
	    1 - streaming
	    2 - interactive
	    3 - background
	    4 - subscribed value
	
	<Maximum bitrate UL> - Maximum bitrate Up Link (kbits/s)
	    0 - subscribed value
	    1…384
	
	<Maximum bitrate DL> - Maximum bitrate down link (kbits/s)
	    0 - subscribed value
	    1…568
	    576…7168
	
	<Guaranteed bitrate UL> - the guaranteed bitrate up link(kbits/s)
	    0 - subscribed value
	    1…384
	
	<Guaranteed bitrate DL> - the guaranteed bitrate down link(kbits/s)
	    0 - subscribed value
	    1…568
	    576…7168
	
	<Delivery order> SDU Delivery oreder
	    0 - no
	    1 - yes
	    2 - subscribed value

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

	<Maximum SDU size> Maximum SDU size in octets
	   0 - subscribed value
	   10…1500
	   1502
	   1510
	   1520
	
	<SDU error ratio> SDU error ratio
	   - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$
	   "0E0"
	   "1E1"
	   "1E2"
	   "7E3"
	   "1E3"
	   "1E4"
	   "1E5"
	   "1E6"
	
	<Residual bit error ratio> Residual bitt error ratio
	   - mEe mean $m*10^{-e}$, for example 1E2 mean $1*10^{-2}$
	   "0E0"
	   "5E2"
	   "1E2"
	   "5E3"
	   "4E3"
	   "1E3"
	   "1E4"
	   "1E5"
	   "1E6"
	   "6E8"
	
	<Delivery of erroneous SDUs> Delivery of erroneous SDUs
	   0 - no
	   1 – yes
	   2 – no detect
	   3 – subscribed value
	
	<Transfer delay > Transfer delay (milliseconds)
	   0 – subscribed value
	   10…150
	   200-950
	   1000-4000
	
	<Traffic handling priority > Traffic handling priority
	   0- subscribed value
	   1…3

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

	<Source Statistics Descriptor> Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the <Traffic class> is specified as conversational or streaming.
	    0 - Characteristics of SDUs is unknown (default value)
	    1 - Characteristics of SDUs corresponds to a speech source
	
	<Signalling Indication> Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the <Traffic class> is specified as interactive.
	    0 - PDP context is not optimized for signalling (default value)
	    1 - PDP context is optimized for signalling <PDP_type> (see +CGDCONT command).
	
	Note: a special form of the Set command, **+CGEQMIN=<cid>** causes the requested profile for context number **<cid>** to become undefined.

AT+CGEQMIN?	Read command returns the current settings for each defined context in the format: **[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>< Source Statistics Descriptor >< Signalling Indication ><CR><LF>]** **[+CGEQMIN:…]** If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGEQMIN=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQMIN: <PDP_Type>,(list of supported <Traffic class>s), (list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s),(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”,0,0,1,0,0 OK AT+CGEQMIN? +CGEQMIN: 1,0,384,384,128,128,0,0,”0E0”,”0E0”,0,0,1,0,0 OK AT+CGEQMIN=? +CGEQMIN: "IP",(0-4),(0-384),(0-568,576-7168),(0-384),(0-568,576-7168),(0-

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	
	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"),(0-2),(0,10-150,200-950,1000-4000),(0-3),(0-1),(0-1) +CGEQMIN: "PPP",(0-4),(0-384),(0-568,576-7168),(0-384),(0-568,576-7168),(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"),(0-2),(0,10-150,200-950,1000-4000),(0-3),(0-1),(0-1) OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.7.10.   3G Quality of Service Profile (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).
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

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	
	OK
Reference	3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

5.4.7.11.   PDP Context Activate Or Deactivate - +CGACT

+CGACT - PDP Context Activate Or Deactivate	

AT+CGACT= [<state>[,<cid> [,<cid>[,…]]]]	Execution command is used to activate or deactivate the specified PDP context(s)
	
	Parameters:
	<state> - indicates the state of PDP context activation
	  0 - deactivated
	  1 - activated
	<cid> - a numeric parameter which specifies a particular PDP context definition
	         (see **+CGDCONT** command)
	
	Note: if no **<cid>**s are specified the activation/deactivation form of the command activates/deactivates all defined contexts.

AT+CGACT?	Read command returns the current activation state for all the defined PDP contexts in the format: **+CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>[…]]**
AT+CGACT=?	Test command reports information on the supported PDP context activation states parameters in the format: **+CGACT: (0,1)**
Example	AT+CGACT=1,1 OK AT+CGACT? +CGACT: 1,1 OK
Reference	3GPP TS 27.007

5.4.7.12.   Show PDP Address - +CGPADDR

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

5.4.7.13.   Modify PDP Context - +CGCMOD

+CGCMOD – Modify PDP context	
AT+CGCMOD= [<cid1>[,<cid2>[,…,< cidN>]]]	The execution command is used to modify the specified PDP context(s) with respect to QoS profiles. If no <cidi> is specified the command modifies all active contexts. Parameters: <cidi>: a numeric parameter which specifies a particular PDP context
AT+ CGCMOD =?	Test command returns a list of <cid>s associated with active contexts.

5.4.8. Commands For Battery Charger

5.4.8.1. Battery Charge - +CBC

+ CBC - Battery Charge	

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

AT+CBC=?	Test command returns parameter values supported as a compound value. **+CBC: (0-3),(0-100)** Note: although **+CBC** is an execution command, 3gpp TS 27.007 requires the Test command to be defined.
Example	AT+CBC +CBC: 0,75 OK
Note	The **ME** does not make differences between being powered by a battery or by a power supply on the **VBATT** pins, so it is not possible to distinguish between these two cases.
Reference	3GPP TS 27.007

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

5.5.1. General Configuration

5.5.1.1. Select Message Service - +CSMS

+CSMS - Select Message Service	

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

AT+CSMS?	Read command reports current service setting along with supported message types in the format: **+CSMS: <service>,<mt>,<mo>,<bm>** where: **<service>** - messaging service (see above) **<mt>** - mobile terminated messages support (see above) **<mo>** - mobile originated messages support (see above) **<bm>** - broadcast type messages support (see above)
AT+CSMS=?	Test command reports the supported value of the parameter **<service>**.
Example	AT+CSMS=1 +CSMS: 1,1,1 OK

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

5.5.1.2.　　Preferred Message Storage - +CPMS

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

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

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 3.40/23.040 and 3GPP TS 3.41/23.041
	                (factory default)
	  1 - text mode

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

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.

+CSCA -Service Center Address	

	Parameter:
	<number> - SC phone number in the format defined by **<type>**
	<type> - the type of number
	  129 - national numbering scheme
	  145 - international numbering scheme (contains the character "+")
	
	Note: to use the SM service, is mandatory to set a Service Center Address at which service requests will be directed.
	
	Note: in Text mode, this setting is used by send and write commands; in PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into the **<pdu>** parameter equals zero.
	
	Note: the current settings are stored through **+CSAS**

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

5.5.2.2.   Set Text Mode Parameters - +CSMP

+CSMP - Set Text Mode Parameters	

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

+CSMP - Set Text Mode Parameters	
	[00] - Validity Period field *not present*
	[01] - Validity Period field present in *enhanced format*(i.e. quoted time-string type, see below)
	[10] - Validity Period field present in *relative format*, (i.e. integer type, see below)
	[11] - Validity Period field present in *absolute format* (i.e. quoted time-string type, see below)
	bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report (default is [0]);
	[0] - MS is not requesting a status report
	[1] - MS is requesting a status report
	bit[6]: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);
	bit[7]: Reply Path, 1-bit field indicating the request for Reply Path (default is [0]);
	[0] - Reply Path not requested
	[1] - Reply Path requested
	<vp> - depending on **<fo>** setting:
	a) if **<fo>** asks for a *Not Present* Validity Period, **<vp>** can be any type and it will be not considered;
	b) if **<fo>** asks for a Validity Period in *relative format*, **<vp>** shall be integer type (default 167, i.e. 24 hours);
	0..143 - (**<vp>** + 1) x 5 minutes
	144..167 - 12 hours + ((**<vp>** - 143) x 30 minutes)
	168..196 - (**<vp>** - 166) x 1 day
	197..255 - (**<vp>** - 192) x 1 week
	c) if **<fo>** asks for a Validity Period in *absolute format*, **<vp>** shall be quoted time-string type (see **+CCLK**)
	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 Fuctionality Indicator extension octets to follow
	bit[6]: Single Shot SM;
	[0] - the SC is not required to make up to one delivery attempt
	[1] - the SC is required to make up to one delivery attempt
	bit[5]bit[4]bit[3]: reserved
	[000]
	bit[2]bit[1]bit[0]: Validity Period Format
	[000] - No Validity Period specified
	[001] - Validity Period specified as for the relative format. The following octet contains the VP value as described before; all the other octets are 0's.
	[010] - Validity Period is relative in integer representation. The

+CSMP - Set Text Mode Parameters	
	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: we're storing through **+CSAS** the **<vp>** value too, but only as integer type, i.e. only in its *relative format* Note: **<vp>**, **<pid>** and **<dcs>** default values are loaded from first SIM *SMS Parameters* profile, if present. If it is not present, then the default values are those above indicated.
AT+CSMP?	Read command reports the current setting in the format: **+CSMP: < fo>,<vp>,<pid>,<dcs>** Note: if the Validity Period Format (**<fo>**'s **bit[4]bit[3]**) is [00] (i.e. *Not Present*), **<vp>** is represented just as a quoted empty string (**""**).
AT+CSMP=?	Test command returns the **OK** result code.
Example	*Set the parameters for an outgoing message with 24 hours of validity period and default properties:* AT+CSMP=17,167,0,0 OK *Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 24 hours of validity period.* AT+CSMP=9,"01A80000000000" OK *Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 60 seconds of validity period.* AT+CSMP=9,"023C0000000000" OK *Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 29 hours 85 minutes 30 seconds of validity period.*

+CSMP - Set Text Mode Parameters	
	AT+CSMP=9,"03925803000000" OK
Reference	3GPP TS 27.005; 3GPP TS 03.40/23.040; 3GPP TS 03.38/23.038

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>**
	  1 - show the values in result codes

AT+CSDH?	Read command reports the current setting in the format: **+CSDH: <show>**
AT+CSDH=?	Test command reports the supported range of values for parameter **<show>**
Reference	3GPP TS 27.005

5.5.2.4. Select Cell Broadcast Message Types - +CSCB

+CSCB -Select Cell Broadcast Message Types	

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

AT+CSCB?	Read command reports the current value of parameters **<mode>**, **<mids>** and **<dcss>**.
AT+CSCB=?	Test command returns the range of values for parameter **<mode>**.
Example	AT+CSCB? +CSCB: 1,"","" OK *(all CBMs are accepted, none is rejected)* AT+CSCB=0,"0,1,300-315,450","0-3" OK
Reference	3GPP TS 27.005, 3GPP TS 03.41/23.041, 3GPP TS 03.38/23.038.

5.5.2.5.　　Save Settings - +CSAS

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

5.5.2.6.　　Restore Settings - +CRES

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

+CMMS – More Message to Send	

	Parameter:
	<n>
	  0 – Disable (factory default)
	  1 - Keep link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed and the parameter <n> is automatically res et 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 GRPS is not available) 3 - Circuit switched preferred (use Packet Domain if circuit switched not available) Note: If SMS transfer via Packet Domain fails, <service> parameter are automatically reset to Circuit switched.
AT+CGSMS?	Read command reports the currently selected service or service preference : **+CGSMS: <service>**
AT+CGSMS=?	Test command reports the supported range of values for parameter **<service>**
Reference	3GPP TS 27.007

5.5.3.   Message Receiving And Reading

5.5.3.1.   New Message Indications To Terminal Equipment - +CNMI

+CNMI - New Message Indications To Terminal Equipment	

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

+CNMI - New Message Indications To Terminal Equipment

routed to the TE using the following unsolicited result code:
 	
+CMTI: <memr>,<index>
where:
  <memr> - memory storage where the new message is stored
    "SM"
    "ME"
  <index> - location on the memory where SMS is stored.
2 - SMS-DELIVERs (except class 2 messages and messages in the message
    waiting indication group) are routed directly to the TE using the following
    unsolicited result code:
 	
(PDU Mode)
+CMT: <alpha>,<length><CR><LF><pdu>
where:
  <alpha> - alphanumeric representation of originator/destination number
      corresponding to the entry found in MT phonebook; used
      character set should be the one selected with command +CSCS.
  <length> - PDU length
  <pdu> - PDU message
 	
(TEXT Mode)
**+CMT:<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcs>,
<sca>,<tosca>,<length>]<CR><LF><data>** (the information written in
italics will be present depending on **+CSDH** last setting)
where:
  <oa> - originating address, string type converted in the currently selected
     character set (see +CSCS)
  <alpha> - alphanumeric representation of **<oa>**; used character set should be
     the one selected with command +CSCS.
  <scts> - arrival time of the message to the SC
  <tooa>, <tosca> - type of number **<oa>** or *<sca>:*
    129 - number in national format
    145 - number in international format (contains the "+")
  <fo> - first octet of 3GPP TS 03.40/23.040
  <pid> - Protocol Identifier
  <dcs> - Data Coding Scheme
  <sca> - Service Centre address, string type, converted in the currently
     selected character set (see +CSCS)
  <length> - text length
  <data> - TP-User-Data
    • If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used and
      <fo> indicates that GSM03.40/23.040 TP-User-Data-Header-Indication
      is not set (bit 6 of **<fo>** is 0), each character of GSM/WCDMA alphabet
      will be converted into current TE character set (see +CSCS)
    • If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used or
      <fo> indicates that GSM03.40/23.040 TP-User-Data-Header-Indication
      is set (bit 6 of **<fo>** is 1), each 8-bit octet will be converted into two

+CNMI - New Message Indications To Terminal Equipment	
	IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
	Class 2 messages and messages in the message waiting indication group (stored message) result in indication as defined in **<mt>=1**.
	3 - Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in **<mt>=2**. Messages of other data coding schemes result in indication as defined in **<mt>=1**.
	<bm> - broadcast reporting option
	0 - Cell Broadcast Messages are not sent to the **DTE**
	2 - New Cell Broadcast Messages are sent to the **DTE** with the unsolicited result code:
	(PDU Mode)
	+CBM: <length><CR><LF><PDU>
	where:
	<length> - PDU length
	<PDU> - message PDU
	(TEXT Mode)
	+CBM:<sn>,<mid>,<dcs>,<pag>,<pags><CR><LF><data>
	where:
	<sn> - message serial number
	<mid> - message ID
	<dcs> - Data Coding Scheme
	<pag> - page number
	<pags> - total number of pages of the message
	<data> - CBM Content of Message
	• If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS)
	• If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
	<ds> - SMS-STATUS-REPORTs reporting option
	0 - status report receiving is not reported to the **DTE** and messages are stored
	1 - the status report is sent to the **DTE** with the following unsolicited result code:
	(PDU Mode)
	+CDS: <length><CR><LF><PDU>
	where:
	<length> - PDU length
	<PDU> - message PDU
	(TEXT Mode)
	+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>

+CNMI - New Message Indications To Terminal Equipment	

	where:
	  <fo> - first octet of the message PDU
	  <mr> - message reference number
	  <ra> - recipient address, string type, represented in the currently selected character set (see +CSCS)
	  <tora> - type of number **<ra>**
	  <scts> - arrival time of the message to the SC
	  <dt> - sending time of the message
	  <st> - message status as coded in the PDU
	
	  2 - if a status report is stored, then the following unsolicited result code is sent:
	    +CDSI: <memr>,<index>
	
	    where:
	     <memr> - memory storage where the new message is stored
	      "SR"
	     <index> - location on the memory where SMS is stored
	<bfr> - buffered result codes handling method:
	  0 - **TA** buffer of unsolicited result codes defined within this command is flushed to the **TE** when **<mode>=1..3** is entered (**OK** response shall be given before flushing the codes)
	  1 - **TA** buffer of unsolicited result codes defined within this command is cleared when **<mode>=1..3** is entered.

AT+CNMI?	Read command returns the current parameter settings for **+CNMI** command in the form: **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>**
AT+CNMI=?	Test command reports the supported range of values for the **+CNMI** command parameters.
Reference	3GPP TS 27.005
Example	AT+CMGF=1 OK AT+CNMI=1,2,0,1,0 OK *Received message from network* +CMT: "+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE
Note	**DTR** signal is ignored, hence the indication is sent even if the **DTE** is inactive (**DTR** signal is **Low**). In this case the unsolicited result code may be lost so if MODULE remains active while **DTE** is not, at **DTE** startup is suggested to check whether new messages have reached the device meanwhile with command **AT+CMGL=0** that lists the new messages received.

5.5.3.2.   List Messages - +CMGL

+CMGL - List Messages	

AT+CMGL [=<stat>]	Execution command reports the list of all the messages with status value **<stat>** stored into **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS).
	
	The parameter type and the command output depend on the last settings of command **+CMGF** (message format to be used)
	
	(PDU Mode)
	Parameter:
	<stat>
	  0 - new message
	  1 - read message
	  2 - stored message not yet sent
	  3 - stored message already sent
	  4 - all messages.
	
	Each message to be listed is represented in the format:
	
	+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>
	
	where:
	<index> - message position in the memory storage list.
	<stat> - status of the message
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
	<length> - length of the PDU in bytes
	<pdu> - message in PDU format according to 3GPP TS 3.40/23.040
	
	(Text Mode)
	Parameter:
	<stat>
	  "REC UNREAD" - new message
	  "REC READ" - read message
	  "STO UNSENT" - stored message not yet sent
	  "STO SENT" - stored message already sent
	  "ALL" - all messages.
	
	Each message to be listed is represented in the format (the information written in italics will be present depending on +CSDH last setting):
	
	+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>*[,<tooa/toda>, <length>]*<CR><LF> <data>
	
	where

+CMGL - List Messages	
	<index> - message position in the storage
	<stat> - message status
	<oa/da> - originator/destination address, string type , represented in the currently selected character set (see +CSCS)
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
	<scts> - TP-Service Centre Time Stamp in Time String Format
	<tooa/toda> - type of number **<oa/da>**
	129 - number in national format
	145 - number in international format (contains the "+")
	<length> - text length
	<data> - TP-User-Data
	• If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS)
	• If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
	Each message delivery confirm is represented in the format**:**
	+CMGL: <index>,<stat>,<fo>,<mr>,,,<scts>,<dt>,<st>
	where
	<index> - message position in the storage
	<stat> - message status
	<fo> - first octet of the message PDU
	<mr> - message reference number
	<scts> - arrival time of the message to the SC
	<dt> - sending time of the message
	<st> - message status as coded in the PDU
	Note: If parameter is omitted the command returns the list of sms with "**REC UNREAD**" status.
AT+CMGL=?	Test command returns a list of supported **<stat>**s
Example	AT+CMGF=1 *Set Text mode* OK AT+CMGL +CMGL: 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 - List Messages	
	+CMGL: 5,"REC UNREAD","+821020955219",,"07/07/26,20:09:07+36" TEST MESSAGE OK AT+CMGF=0 *Set PDU mode* OK AT+CMGL=2 +CMGL: 0,2,,24 079128019291903011640A8110567892820000A70CF4F29C0E6A97E7F3F0B90C +CMGL: 1,2,,21 079128019291903011640A8110516529700000A709027A794E77B95C2E +CMGL: 26,2,,17 0881280100990102591640A8110567892820014A704C7D1B1DB OK
Reference	3GPP TS 27.005

5.5.3.3. Read Message - +CMGR

+CMGR - Read Message	

AT+CMGR= <index>	Execution command reports the message with location value **<index>** from **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command +CPMS).
	
	Parameter:
	<index> - message index.
	
	The output depends on the last settings of command **+CMGF** (message format to be used)
	
	 (PDU Mode) The output has the following format:
	
	+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>
	
	where
	<stat> - status of the message
	  0 - new message
	  1 - read message
	  2 - stored message not yet sent
	  3 - stored message already sent
	<alpha> - string type alphanumeric representation of **<da>** or **<oa>**,
	        corresponding to an entry found in the phonebook; used character set is
	        the one selected with command +CSCS.
	<length> - length of the PDU in bytes.
	<pdu> - message in PDU format according to 3GPP TS 3.40/23.040.
	
	The status of the message and entire message data unit **<pdu>** is returned.
	
	 (Text Mode) Output format for received messages (the information written in *italics* will be present depending on **+CSDH** last setting):
	+CMGR*: <stat>,<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>, <dcs>,<sca>,<tosca>,<length>]<CR><LF><data>*
	
	Output format for sent messages:
	+CMGR: <stat>,<da>,<alpha>[,<toda>,<fo>,<pid>,<dcs>,[<vp>], <sca>,<tosca>,<length>]<CR><LF><data>
	
	Output format for message delivery confirm:
	+CMGR: <stat>,<fo>,<mr>,,,<scts>,<dt>,<st>
	
	where:
	<stat> - status of the message
	  "REC UNREAD" - new received message unread

+CMGR - Read Message	

	"REC READ" - received message read
	"STO UNSENT" - message stored not yet sent
	"STO SENT" - message stored already sent
	<fo> - first octet of the message PDU
	<mr> - message reference number
	<scts> - arrival time of the message to the SC
	<dt> - sending time of the message
	<st> - message status as coded in the PDU
	<pid> - Protocol Identifier
	<dcs> - Data Coding Scheme
	<vp> - depending on SMS-SUBMIT **<fo>** setting:
	    Refer to 3GPP TS 03.40/23.040 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 "+")
	<length> - text length
	<data> - TP-User_data
	• If **<dcs>** indicates that GSM03.38/23.038 default alphabet is used , each character of GSM/WCDMA alphabet will be converted into current TE character set (see +CSCS)
	• If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
	
	Note: in both cases if status of the message is 'received unread', status in the storage changes to 'received read'.

AT+CMGR=?	Test command returns the **OK** result code
Example	AT+CMGF=0 AT+CMGR=1 +CMGR: 2,,21

+CMGR - Read Message	
	079128019291903011640A8110516529700000A709027A794E77B95C2E
	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.
(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)**

+CNMA – New Message Acknowledgement	
	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 0681600058542600048098060F170110370537284… *Send positive acknowledgement to the network.* AT+CNMA=0 OK *Message is received from network.* +CMT: "",70 0681600058542600048098060F170110370537284… *Send negative acknowledgement(Unspecified error) to the network.* AT+CNMA=2,3<CR> > 00FF00 <Ctrl-Z> OK **(Text Mode)** *SMS AT commands compatible with 3GPP TS 27.005 Phase 2+ version .* AT+CSMS=1 +CSMS: 1,1,1 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.*

+CNMA – New Message Acknowledgement	
	AT+CNMA OK
Reference	3GPP TS 27.005

5.5.4.   Message Sending And Writing

5.5.4.1.   Send Message - +CMGS

+CMGS - Send Message	
(PDU Mode) **AT+CMGS=** **<length>**	**(PDU Mode)** Execution command sends to the network a message. Parameter: **<length>** - length of the PDU to be sent in bytes (excluding the SMSC address octets). 7..164 After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** and waits for the specified number of bytes. Note: the **DCD** signal shall be in **ON** state while PDU is given. Note: the echoing of given characters back from the TA is controlled by echo command **E** 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.

+CMGS - Send Message	
	Note: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.

(Text Mode)
AT+CMGS=<da>
[,<toda>]
	(Text Mode)
	Execution command sends to the network a message.
	
	Parameters:
	<da> - destination address, string type represented in the currently selected character set (see +CSCS).
	<toda> - type of destination address
	  129 - number in national format
	  145 - number in international format (contains the "+")
	
	After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt:
	
	<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)
	
	After this prompt text can be entered; the entered text should be formatted as follows:
	
	- if current **<dcs>** (see +CSMP) indicates that GSM03.38/23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM/WCDMA alphabet, according to 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used.
	- if current **<dcs>** (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see +CSMP) indicates that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**)
	
	Note: the **DCD** signal shall be in **ON** state while text is entered.
	
	Note: the echoing of entered characters back from the TA is controlled by echo command **E**
	
	To send the message issue **Ctrl-Z** char (**0x1A** hex).
	To exit without sending the message issue **ESC** char (**0x1B** hex).
	
	If message is successfully sent to the network, then the result is sent in the format:
	Note : Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned:
	
	+CMGS: <mr>[, <scts>]

+CMGS - Send Message	
	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>**: 1530 chars if 3GPP TS 03.38/23.038 default alphabet is used, 1340 chars if 8-bit is used, 670 chars if UCS2 is used
AT+CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	*Set PDU mode* AT+CMGF=0 AT+CMGS=18 > 088128010099010259115507811020905512F90000A704F4F29C0E +CMGS: 124 OK *Set text mode* AT+CMGF=1 AT+CSMP=17,167,0,0 AT+CMGS="01090255219",129 >TEST MESSAGE +CMGS:125 OK
Reference	3GPP TS 27.005

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 which is already stored in the **<memw>** storage (see +**CPMS**) at the location **<index>**.
	Parameters:
	<index> - location value in the message storage **<memw>** of the message to send
	<da> - destination address, string type represented in the currently selected character set (see +**CSCS**); if it is given it shall be used instead of the one stored with the message.
	<toda> - type of destination address
	  129 - number in national format
	  145 - number in international format (contains the "+")
	
	If message is successfully sent to the network then the result is sent in the format:
	(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 resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Example	AT+CMGF=1 OK AT+CMGW="0165872928" > test message... +CMGW: 28 AT+CMSS=28 +CMSS: 136 OK
Reference	3GPP TS 27.005

5.5.4.3.   Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	

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

(Text Mode)
AT+CMGW[=<da>
[,<toda>
[,<stat>]]]
	(Text Mode)
	Execution command writes in the **<memw>** memory storage a new message.
	
	Parameters:
	<da> - destination address, string type represented in the currently selected character set (see +CSCS).
	<toda> - type of destination address.
	  129 - number in national format
	  145 - number in international format (contains the "+")
	<stat> - message status.
	  "REC UNREAD" - new received message unread
	  "REC READ" - received message read
	  "STO UNSENT" - message stored not yet sent (default)
	  "STO SENT" - message stored already sent
	
	After command line is terminated with **<CR>**, the device responds sending a four

+CMGW - Write Message To Memory	
	character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** After this prompt text can be entered; the entered text should be formatted as follows: - if current **<dcs>** (see +CSMP) indicates that GSM03.38/23.038 default alphabet is used and current **<fo>** (see +CSMP) indicates that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM/WCDMA alphabet, according to 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used. - if current **<dcs>** (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see +CSMP) indicates that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) Note: the **DCD** signal shall be in ON state while text 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>**: 1530 chars if 3GPP TS 03.38/23.038 default alphabet is used, 1340 chars if 8-bit is used, 670 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

+CMGW - Write Message To Memory	
	AT+CMGW=18 > 088128010099010259115507811020905512F90000A704F4F29C0E +CMGW: 29 OK AT+CMGF=1 *set text mode* OK AT+CSMP=17,167,0,0 OK AT+CSCA="821029190903",145 OK AT+CMGW="0165872928" > test message... +CMGW: 28
Note	To avoid malfunctions is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

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: if the location to be deleted is empty, an error message is reported.

AT+CMGD=?	Test command shows the valid memory locations and optionally the supported values of **<delflag>**. **+CMGD: (supported <index>s list)[,(supported <delflag>s list)]**

こ

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

5.6.   Telit Custom AT Commands

5.6.1.   General Configuration AT Commands

5.6.1.1.   Network Selection Menu Availability - +PACSP

+PACSP – Network Selection Menu Availability	

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

AT+PACSP=?	Test command returns the OK result code.

5.6.1.2.   Manufacturer Identification - #CGMI

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

5.6.1.3.   Model Identification - #CGMM

#CGMM - Model Identification	
AT#CGMM	Execution command returns the device model identification code with command echo.

#CGMM - Model Identification	
AT#CGMM=?	Test command returns the **OK** result code.
Example	AT#CGMM #CGMM:UE910-QC OK

5.6.1.4.   Revision Identification - #CGMR

#CGMR - Revision Identification	
AT#CGMR	Execution command returns device software revision number with command echo.
AT#CGMR=?	Test command returns the **OK** result code.
Example	AT#CGMR #CGMR: 08.01.005 OK

5.6.1.5.   Product Serial Number Identification - #CGSN

#CGSN - Product Serial Number Identification	
AT#CGSN	Execution command returns the product serial number, identified as the IMEI of the mobile, with command echo.
AT#CGSN=?	Test command returns the **OK** result code.
Example	AT#CGSN #CGSN: 358677008900540 OK

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

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

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

#CCID - Read ICCID	
AT#CCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)
AT#CCID=?	Test command returns the **OK** result code.
Example	AT#CCID #CCID: 8982050702100167684F OK

5.6.1.8.　Service Provider Name - #SPN

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

5.6.1.9.　New Operator Names - #PLMNMODE

#PLMNMODE – Apply to New Operator Names	
AT#PLMNMODE=\<mode>	Set command apply to new operator names depending on the parameter **\<mode>**. Parameter: **\<mode>** 　0 – previous operator names(factory default) 　1 – new operator names Note : if \<mode>=1, AT+COPN command shows new operator names. The command can be used in state CPIN: READY Note : **\< mode >** is saved in NVM.
AT#PLMNMODE?	Read command returns current value of the parameter **\<mode>**.
AT#PLMNMODE=?	Test command returns supported values of the parameter **\<mode>**.

5.6.1.10.　Display PIN Counter - #PCT

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

#PCT - Display PIN Counter	
	OK AT#PCT *Check PIN remained counter* #PCT: 3 OK AT+CPIN=1111 *Input incorrect PIN number* +CME ERROR: incorrect password AT#PCT #PCT: 2

5.6.1.11.   Software Shut Down - #SHDN

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

5.6.1.12.   Extended Reset - #Z

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

5.6.1.13.   Periodic Reset - #ENHRST

#ENHRST – Periodic Reset	
AT#ENHRST=<mod>[,<delay>]	Set command enables/disables the unit reset after <delay> minutes. Parameters: <mod> 0 – disables the unit reset (factory default) 1 – enables the unit reset only for one time 2 – enables the periodic unit reset <delay> - time interval after that the unit reboots; numeric value in minutes

#ENHRST – Periodic Reset	
	Note: the settings are saved automatically in NVM only if old or new mod is 2. Any change from 0 to 1 or from 1 to 0 is not stored in NVM

Note: the particular case AT#ENHRST=1,0 causes the immediate module reboot. In this case if AT#ENHRST=1,0 follows an AT command that stores some parameters in NVM, it is recommended to insert a delay of at least 5 seconds before to issue AT#ENHRST=1,0, to permit the complete NVM storing.

Note: maximum <**delay**> value is 2184 mins |
| AT# ENHRST? | Read command reports the current parameter settings for # EHNRST command in the format:

EHNRST: < **mod** >[,<**delay**>,<**remainTime**>]

   <**remainTime**> - time remaining before next reset |
| AT# ENHRST =? | Test command reports supported range of values for parameters <**mod**> and <**delay**>. |
| Examples | AT#ENHRST=1,60

.... Module reboots after 60 minutes …

AT#ENHRST=1,0 |

5.6.1.14.   Wake From Alarm Mode - #WAKE

#WAKE - Wake From Alarm Mode	
AT#WAKE= [<opmode>]	Execution command stops any eventually present alarm activity and, if the module is in **alarm mode**, it exits the **alarm mode** and enters the **normal operating mode**.

Parameter:
<opmode> - operating mode
  0 - normal operating mode; the module exits the **alarm mode**, enters the **normal operating mode**, any alarm activity is stopped (e.g. alarm tone playing) and an **OK** result code is returned.

Note: The "alarm mode" is indicated by hardware pin **CTS** to the **ON** status and **DSR** to the **OFF** status, while the "power saving" status is indicated by a **CTS** - **OFF** ,**DSR** - **OFF** and USB_VBUS – OFF status. The normal operating status is indicated by **DSR** – **ON or USB_VBUS – ON status**.

Note: during the **alarm mode** the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SM, the only commands that can be issued to the MODULE in this state are the **#WAKE** and **#SHDN**, every other command must not be issued during this state. |
| AT#WAKE? | Read command returns the **operating status** of the device in the format: |

#WAKE - Wake From Alarm Mode	

	#WAKE: \<status\>
	
	where:
	\<status\>
	  0 - normal operating mode
	  1 - alarm mode or normal operating mode with some alarm activity.

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

5.6.1.15.   Temperature Monitor – #TEMPMON

#TEMPMON - Temperature Monitor	

AT#TEMPMON=
\<mod\>
[,\<urcmode\>
[,\<action\>
[,\<hyst_time\>
[,\<GPIO\>]]]]
	Set command sets the behavior of the module internal temperature monitor.
	
	Parameters:
	
	\<mod\>
	  0 - sets the command parameters.
	  1 - triggers the measurement of the module internal temperature, reporting the result in the format:
	
	   #TEMPMEAS: \<level\>,\<value\>
	
	   where:
	   \<level\> - threshold level
	     -2 - extreme temperature lower bound (see Note)
	     -1 - operating temperature lower bound (see Note)
	      0 - normal temperature
	      1 - operating temperature upper bound (see Note)
	      2 - extreme temperature upper bound (see Note)
	
	   \<value\>
	   actual temperature expressed in Celsius degrees
	
	Setting of the following optional parameters has meaning only if \<mod\>=0:
	
	\<urcmode\> - URC presentation mode. **(Default 0)**
	  0 - it disables the presentation of the temperature monitor URC
	  1 - it enables the presentation of the temperature monitor URC, whenever the module internal temperature reaches either operating or extreme levels;
	   the unsolicited message is in the format:

#TEMPMEAS: <level>,<value>

where:
<level> and <value> are as before

<action> - sum of integers, each representing the action to be done whenever the module internal temperature reaches either operating or extreme levels (default is 0). If <action> is not zero, it is mandatory to set the <hyst_time> parameter too.

0 - no action (00)

1 - automatic shut-down when the temperature is beyond the extreme bounds (01)

2 - RF TX circuits automatically disabled (using +CFUN=2) when operating temperature bounds are reached. When the temperature is back to normal the module is brought back to the previous state, before RF TX disabled. (10)

4 - the output pin <GPIO> is tied HIGH when operating temperature bounds are reached; when the temperature is back to normal the output pin <GPIO> is tied LOW. If this <action> is required, it is mandatory to set the <GPIO> parameter too. (100)

Note: Possible values for the parameter <action> are form 0 to 7 (000, 001, 010, 011, 100, 101, 110 and 111)

Note : <action>-2 can not be supported because +CFUN=2 is not supported.

<hyst_time> - hysteresis time: all the actions happen only if the extreme or operating bounds are maintained at least for this period. This parameter is needed and required if <action> is not zero.

0..255 - time in seconds

Note: <action> can assume values from 1-7

<GPIO> - GPIO number. Valid range is "any output pin" (see "Hardware User's Guide"). This parameter is needed and required only if <action>=4 is enabled.

Note: **if the <GPIO> is specified <action> shall** assume values from 4-7.

Note: last <urcmode> settings are saved as extended profile parameters.

Note: last <action>, <hyst_time> and <GPIO> settings are global parameters saved in NVM

AT#TEMPMON?	Read command reports the current parameter settings for **#TEMPMON**

	command in the format: **#TEMPMON: <urcmode>,<action>[,<hyst_time>[,<GPIO>]]**
AT#TEMPMON=?	Test command reports the supported range of values for parameters **<mod>**, **<urcmode>**, **<action>**, **<hyst_time>** and **<GPIO>**
Note	<table><tr><td colspan="2" align="center">**GSM Limits**</td></tr><tr><td>**Extreme Temperature Lower Bound**[*]</td><td>**-40°C**</td></tr><tr><td>**Operating Temperature Lower Bound**[*]</td><td>**-40°C**</td></tr><tr><td>**Operating Temperature**</td><td></td></tr><tr><td>**Operating Temperature Upper Bound**[*]</td><td>**+85°C**</td></tr><tr><td>**Extreme Temperature Upper Bound**[*]</td><td>**+85°C**</td></tr><tr><td colspan="2"> </td></tr><tr><td colspan="2">**WCDMA Limits**</td></tr><tr><td>**Extreme Temperature Lower Bound**[*]</td><td>**-40°C**</td></tr><tr><td>**Operating Temperature Lower Bound**[*]</td><td>**-40°C**</td></tr><tr><td>**Operating Temperature**</td><td></td></tr><tr><td>**Operating Temperature Upper Bound**[*]</td><td>**+85°C**</td></tr><tr><td>**Extreme Temperature Upper Bound**[*]</td><td>**+85°C**</td></tr></table> [*] Due to temperature measurement uncertainty there is a tolerance of +/-2°C The automatic power off is deferred in case of an Emergency Call

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

#GPIO - General Purpose Input/Output Pin Control	

AT#GPIO=[<pin>, <mode>[,<dir>[,<save]]]	Execution command sets the value of the general purpose output pin **GPIO<pin>** according to **<dir>** and **<mode>** parameter.
	Not all configuration for the three parameters are valid.
	
	Parameters:
	<pin> - GPIO pin number; supported range is from 1 to a value that depends on the hardware.
	<mode> - its meaning depends on **<dir>** setting:
	  0 - no meaning if **<dir>=0** - INPUT
	   - output pin cleared to 0 (**Low**) if **<dir>=1** - OUTPUT
	   - no meaning if **<dir>=2,3,4,5,6** - ALTERNATE FUNCTION
	  1 - no meaning if **<dir>=0** - INPUT
	   - output pin set to 1 (**High**) if **<dir>=1** - OUTPUT
	   - no meaning if **<dir>=2,3,4,5,6** - ALTERNATE FUNCTION
	  2 - Reports the read value from the input pin if **<dir>=0** - INPUT
	   - Reports the read value from the input pin if **<dir>=1** - OUTPUT
	   - Reports a no meaning value if **<dir>=2** - ALTERNATE FUNCTION
	  3 - if **<dir>=0** – INPUT, enable Pull-Up

#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
	2,3,4,5,6 - pin direction is Alternate Function ALT1, ALT2, ALT3, ALT4, ALT5 respectively (see Note).
	<save> - GPIO pin save configuration
	0 – pin configuration is not saved
	1 – pin configuration is saved
	Note: when <save> is omitted the configuration is stored only if user set or reset ALTx function on <dir> parameter
	Note: if values of **<dir>** is set in output and save omitted then it is set automatically in input on next power cycle.
	Note: when **<mode>=2** (and **<dir>** is omitted) the command reports the direction and value of pin **GPIO<pin>** in the format:
	#GPIO: <dir>,<stat>
	where:
	<dir> - current direction setting for the **GPIO<pin>**
	<stat>
	• logic value read from pin **GPIO<pin>** in the case the pin **<dir>** is set to input;
	• logic value present in output of the pin **GPIO<pin>** in the case the pin **<dir>** is currently set to output;
	• no meaning value for the pin **GPIO<pin>** in the case the pin **<dir>** is set to alternate function.
	Note: "ALT1" value is valid only for following pins:
	GPIO1: alternate function is "Stat Led";
	GPIO7: alternate function is "DAC Output"
	"ALT2" value is valid for all GPIOs: alternate function is "Alarm pin"
	"ALT3" value is valid for all GPIOs as "TempMon Pin"
	"ALT4" value is valid for all GPIOs as "AD_Det Pin"
	"ALT5" value is valid for all GPIOs as "AD_Rep Pin
	Note: while using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and shall be avoided.
	Note: GPIO7 is also configured as DAC pin (ALT1 function) with the command **#DAC**
	Note: Alarm Pin can be also configured through **#ALARMPIN** command

#GPIO - General Purpose Input/Output Pin Control	
	Note: AD_Det and AD_Rep pin can be also configured through **#GSMAD** command
AT#GPIO?	Read command reports the read direction and value of all **GPIO** pins, in the format: **#GPIO: <dir>,<stat>[<CR><LF>#GPIO: <dir>,<stat>[…]]** where: **<dir>** - as seen before **<stat>** - as seen before
AT#GPIO=?	Test command reports the supported range of values of the command parameters **<pin>**, **<mode>, <dir>, <save>**
Example	AT#GPIO=3,0,1 OK AT#GPIO=3,2 #GPIO: 1,0 OK AT#GPIO=4,1,1 OK AT#GPIO=5,0,0 OK AT#GPIO=6,2 #GPIO: 0,1 OK

5.6.1.17.   STAT_LED GPIO Setting - #SLED

#SLED - STAT_LED GPIO Setting	

AT#SLED=<mode>
[,<on_duration>
[,<off_duration>]]
	Set command sets the behaviour of the **STAT_LED** GPIO
	
	Parameters:
	<mode> - defines how the **STAT_LED** GPIO is handled
	  0 - GPIO tied **Low**
	  1 - GPIO tied **High**
	  2 - GPIO handled by Module Software (factory default) with the following timings:
	• not registered : always on
	• registered in idle: blinking 1s on and 2s off
	• registered in idle with powersaving : blinking time depends on network condition in order to minimize power consumption
	  3 - GPIO is turned on and off alternatively, with period defined by the sum **<on_duration>** + **<off_duration>**
	  4 - GPIO handled by Module Software with the following timings:
	• not registered : blinking 0,5s on and 0,5s off
	• registered in idle: blinking 300ms on and 2,7s off

#SLED - STAT_LED GPIO Setting	

	• registered in idle with powersaving : blinking time depends on network condition in order to minimize power consumption
	
	<on_duration> - duration of period in which **STAT_LED** GPIO is tied **High** while **<mode>=3**
	  1..100 - in tenth of seconds (default is 10)
	
	<off_duration> - duration of period in which **STAT_LED** GPIO is tied **Low** while **<mode>=3**
	  1..100 - in tenth of seconds (default is 10)
	
	Note: values are saved in NVM by command **#SLEDSAV**
	
	Note: at module boot the **STAT_LED** GPIO is always tied **High** and holds this value until the first NVM reading.
	
	Note: to have STAT_LED operative, the first time enter AT#GPIO=1,0,2 setting the GPIO1 as alternate function.

AT#SLED?	Read command returns the **STAT_LED** GPIO current setting, in the format: **#SLED: <mode>,<on_duration>,<off_duration>**
AT#SLED=?	Test command returns the range of available values for parameters **<mode>**, **<on_duration>** and **<off_duration>**.

5.6.1.18.   Save STAT_LED GPIO Setting - #SLEDSAV

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

5.6.1.19.   SMS Ring Indicator - #E2SMSRI

#E2SMSRI - SMS Ring Indicator	

AT#E2SMSRI= [<n>]	Set command enables/disables the Ring Indicator pin response to an incoming SMS message. If enabled, a negative going pulse is generated on receipt of an incoming SMS message. The duration of this pulse is determined by the value of **<n>**.
	
	Parameter:
	<n> - **RI** enabling
	  0 - disables **RI** pin response for incoming SMS messages (factory default)
	  50..1150 - enables **RI** pin response for incoming SMS messages. The value of **<n>** is the duration in ms of the pulse generated on receipt of an incoming SM.
	
	Note: if +**CNMI=3,1** command is issued and the module is in a GPRS connection, a 100 ms break signal is sent and a 1 sec. pulse is generated on **RI** pin, no matter if the **RI** pin response is either enabled or not.

AT#E2SMSRI?	Read command reports the duration in ms of the pulse generated on receipt of an

#E2SMSRI - SMS Ring Indicator	
	incoming SM, in the format: **#E2SMSRI: <n>** Note: as seen before, the value **<n>=0** means that the **RI** pin response to an incoming SM is disabled.
AT#E2SMSRI=?	Reports the range of supported values for parameter **<n>**
Example	AT#E2SMSRI=50 OK

5.6.1.20. Read Analog/Digital Converter Input - #ADC

#ADC - Read Analog/Digital Converter Input	

AT#ADC=
[<adc>,<mode>
[,<dir>]]
	Execution command reads pin**<adc>** voltage, converted by ADC, and outputs it in the format:
	
	    #ADC: <value>
	
	    where:
	    <value> - pin**<adc>** voltage, expressed in mV
	
	Parameters:
	<adc> - index of pin
	  1 - available for UE910 V2 family
	<mode> - required action
	  2 - query ADC value
	<dir> - direction; its interpretation is currently not implemented
	  0 - no effect.
	
	Note: The command returns the last valid measure.

AT#ADC?	Read command reports all pins voltage, converted by ADC, in the format: **#ADC: <value><CR><LF>#ADC: <value>**
AT#ADC=?	Test command reports the supported range of values of the command parameters **<adc>**, **<mode>** and **<dir>**.

5.6.1.21. Digital/Analog Converter Control - #DAC

#DAC - Digital/Analog Converter Control	

AT#DAC=
[<enable>
[,<value>]]
	Set command enables/disables the **DAC_OUT** pin.
	
	Parameters:
	<enable> - enables/disables DAC output.
	  0 - disables pin; it is in high impedance status (factory default)
	  1 - enables pin; the corresponding output is driven
	<value> - scale factor of the integrated output voltage; it must be present if
	       <enable>=1

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

5.6.1.22.   Auxiliary Voltage Output Control - #VAUX

#VAUX- Auxiliary Voltage Output Control	

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

AT#VAUX?	Read command reports whether the Auxiliary Voltage pin output is currently

#VAUX- Auxiliary Voltage Output Control	
	enabled or not, in the format: **#VAUX: \<value\>**
AT#VAUX=?	Test command reports the supported range of values for parameters **\<n\>**, **\<stat\>**.

5.6.1.23.   Auxiliary Voltage Output Save - #VAUXSAV

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

5.6.1.24.   V24 Output Pins Configuration - #V24CFG

#V24CFG - V24 Output Pins Configuration	

AT#V24CFG=\<pin\>, \<mode\>	Set command sets the AT commands serial port (**UART**) interface output pins mode.
	
	Parameters:
	\<pin\> - AT commands serial port interface hardware pin:
	  0 - **DCD** (Data Carrier Detect)
	  1 - **CTS** (Clear To Send)
	  2 - **RI** (Ring Indicator)
	  3 - **DSR** (Data Set Ready)
	  4 - **DTR** (Data Terminal Ready). This is not an outptut pin: we maintain this value only for backward compatibility, but trying to set its state raise the result code "**ERROR**" (not yet implemented)
	  5 – **RTS** (Ready To Send). This is not an outptut pin: we maintain this value only for backward compatibility, but trying to set its state raise the result code "**ERROR**"
	\<mode\> - AT commands serial port interface hardware pins mode:
	  0 - AT commands serial port mode: output pins are controlled by serial port device driver. (default)
	  1 - GPIO mode: output pins are directly controlled by **#V24** command only.

AT#V24CFG?	Read command returns actual mode for all the pins in the format: **#V24CFG: \<pin1\>,\<mode1\>[\<CR\>\<LF\>\<CR\>\<LF\>** **#V24CFG: \<pin2\>,\<mode2\>[...]]** Where: **\<pin*n*\>** - AT command serial port interface HW pin **\<mode*n*\>** - AT commands serial port interface hardware pin mode
AT#V24CFG=?	Test command reports supported range of values for parameters **\<pin\>** and **\<mode\>**.

5.6.1.25.   V24 Output Pins Control - #V24

#V24 - V24 Output Pins Control	

#V24 - V24 Output Pins Control	

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

AT#V24?	Read command returns actual state for all the pins in the format: **#V24: <pin1>,<state1>[<CR><LF>** **#V24: <pin2>,<state2>[...]]** where <**pin***n*> **-** AT command serial port interface HW pin <**state***n*> - AT commands serial port interface hardware pin state
AT#V24=?	Test command reports supported range of values for parameters <**pin**> and <**state**>.

5.6.1.26. GPRS Auto-Attach Property - #AUTOATT

#AUTOATT - Auto-Attach Property	

AT#AUTOATT= [<auto>]	Set command enables/disables the TE GPRS auto-attach property.
	
	Parameter:
	<**auto**>
	  0 - disables GPRS auto-attach property
	  1 - enables GPRS auto-attach property (factory default): after the command **#AUTOATT=1** has been issued (and at every following startup) the terminal will automatically try to attach to the GPRS service.

AT#AUTOATT?	Read command reports whether the auto-attach property is currently enabled or not, in the format: **#AUTOATT: <auto>**
AT#AUTOATT=?	Test command reports available values for parameter <**auto**>.

5.6.1.27.   Multislot Class Control – #MSCLASS

#MSCLASS - Multislot Class Control	

AT#MSCLASS=
[<class>,
<autoattach>]
	Set command sets the multislot class
	
	Parameters:
	<class> - multislot class
	  1..12 - GPRS class
	
	Factory default:
	UE910-V2 NAx : 10 by default
	UE910-V2 EUx : 12 by default
	
	<autoattach>
	  0 - the new multislot class is enabled only at the next detach/attach or after a
	      reboot.
	  1 - the new multislot class is enabled immediately, automatically forcing a detach
	      / attach procedure (only in case of GSM network registered).
	
	Note: DTM multislot class is automatically chosen with maximum allowed value
	for every GPRS(EGPRS) subset.

AT#MSCLASS?	Read command reports the current value of the multislot class in the format: #MSCLASS: <class>
AT#MSCLASS=?	Test command reports the range of available values for both parameters <class> and <autoattach>.

5.6.1.28.   Cell Monitor – #MONI

#MONI - Cell Monitor	

AT#MONI[=
[<number>]]
	Set command sets one cell out of seven, in a neighbour of the serving cell
	including it, from which extract GSM/WCDMA-related informations.
	
	Parameter:
	<number>
	
	<GSM network>
	  0..6 - it is the ordinal number of the cell, in a neighbour of the serving cell (default
	        0, serving cell).
	  7 - it is a special request to obtain GSM-related informations from the whole set of
	      seven cells in the neighbour of the serving cell.
	
	<WCDMA network>
	  0 – it is the active set
	  1 – it is the candidate set
	  2 – it is the syncronized neighbour set
	  3 – it is the asyncronized neighbour set
	  4..7 – it is not available

#MONI - Cell Monitor	
	Note: issuing **AT#MONI<CR>** reports the following GSM/WCDMA-related informations for selected cell and dedicated channel (if exists).
	<GSM network>
	a) When extracting data for the serving cell and the network name is known the format is:
	(GSM network)
	#MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>
	(WCDMA network)
	#MONI: <netmame> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>
	b) When the network name is unknown, the format is:
	(GSM network)
	#MONI: Cc:<cc> Nc:<nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>
	(WCDMA network)
	#MONI: Cc:<cc> Nc:<nc> PSC:<psc> RSCP:<rscp> LAC:,<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>
	c) When extracting data for an adjacent cell, the format is:
	(GSM network)
	#MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm> dBm
	(WCDMA network)
	#MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr>
	where:
	<netname> - name of network operator
	<cc> - country code
	<nc> - network operator code
	<n> - progressive number of adjacent cell
	<bsic> - base station identification code
	<qual> - quality of reception
	0..7
	<lac> - localization area code
	<id> - cell identifier (hexadecimal character format)
	<arfcn> - assigned radio channel
	<dBm> - received signal strength in dBm
	<timadv> - timing advance
	<psc> - primary synchronisation code
	<rscp> - Received Signal Code Power in dBm
	<ecio> - chip energy per total wideband power in dBm

#MONI - Cell Monitor	
	<uarfcn> - UMTS assigned radio channel **<drx>** - Discontinuous reception cycle length **<scr>** - Scrambling code Note: TA: **<timadv>** is reported only for the serving cell. When the last setting done is **AT#MONI=7**, then the Read command reports the above informations for each of the cells in the neighbour of the serving cell, formatting them in a sequence of **<CR><LF>-terminated** strings. Currently, it is available in case of GSM network.
AT#MONI=?	Test command reports the maximum number of cells, in a neighbour of the serving cell excluding it, from which we can extract GSM/WCDMA-related informations, along with the ordinal number of the current selected cell, in the format: **#MONI: (<MaxCellNo>,<CellSet>)** where: **<MaxCellNo>** - maximum number of cells, in a neighbour of the serving cell and excluding it, from which we can extract GSM-related informations. This value is always **6**. **<CellSet>** - the last setting done with command **#MONI**.
Note	The refresh time of the measures is preset to 3 sec. The timing advance value is meaningful only during calls or GPRS transfers active.

5.6.1.29.   HSDPA Channel Quality Indication - #CQI

#CQI – HSDPA Channel Quality Indication	

AT#CQI	Execution command reports channel quality indication in the form:
	
	#CQI: <cqi>
	where
	<cqi> - cqi value
	  0 - 30
	   31 - not known or not detectable

AT#CQI=?	Test command returns the supported range of values of the parameters **<cqi>.**

5.6.1.30.   Packet Service Network Type - #PSNT

#PSNT – Packet Service Network Type	

AT#PSNT=<mode>	Set command enables/disables unsolicited result code for packet service network type (PSNT).
	
	Parameter:
	<mode>
	   0 - disable PSNT unsolicited result code (factory default)
	   1 - enable PSNT unsolicited result code
	   2 - PSNT unsolicited result code enabled; read command reports HSUPA
	   and HSDPA related info

#PSNT – Packet Service Network Type	
	Note: **<mode>** parameter setting is stored in NVM.

AT#PSNT?	Read command reports the <mode>,<nt>and HSUPA and HSDPA related info in the format:
	
	(<mode> = 2)
	#PSNT: <mode>,<nt>,<is_hsupa_available>,< is_hsupa_used>,<is_hsdpa_available>,<is_hsdpa_used>
	
	(<mode> = 0 or <mode> = 1)
	#PSNT: <mode>,<nt>
	
	where
	<mode>
	
	   0 - PSNT unsolicited result code disabled
	   1 - PSNT unsolicited result code enabled
	   2 - PSNT unsolicited result code enabled; read command reports HSUPA and HSDPA related info
	
	<nt>- network type
	
	0 - GPRS network
	1 - EGPRS network
	2 - WCDMA network
	3 - HSDPA network
	4 - unknown or not registered.
	
	<is_hsupa_available> - HSUPA available
	
	0 – HSUPA is not supported by network
	1 – HSUPA is supported by network
	
	<is_hsupa_used> - HSUPA used
	
	0 – HSUPA is not in use
	1 – HSUPA is in use
	
	<is_hsdpa_available> - HSDPA available
	
	0 – HSDPA is not supported by network
	1 – HSDPA is supported by network
	
	<is_hsdpa_used> - HSDPA used
	
	0 – HSDPA is not in use
	1 – HSDPA is in use

#PSNT – Packet Service Network Type	
	Note: when the type of network is HSPA, the indication is certainly valid during traffic, while it could be notvalid in idle because it depends on network broadcast parameters
AT#PSNT=?	Test command reports the range for the parameter **<mode>**

5.6.1.31.   Read Current Network Status in 3G Network - #RFSTS

#RFSTS – Read current network Status in 3G network	
AT#RFSTS	Read current status in the format **(GSM network)** **#RFSTS:** **<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,<RR>,<NOM>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>[CR,LF] [CR,LF]**

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

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

Parameter	WCDMA Example	description
PLMN	"450 05"	Country code and operator code(MCC, MNC)

#RFSTS – Read current network Status in 3G network				
	UARFCN	10737	UMTS Assigned Radio Channel	
	PSC	75	Active PSC(Primary Synchronization Code)	
	Ec/Io	-7.0	Active Ec/Io(chip energy per total wideband power in dBm)	
	RSCP	-74	Active RSCP (Received Signal Code Power in dBm)	
	RSSI	-67	Received Signal Strength Indication	
	LAC	2011	Localization Area Code	
	RAC	11	Routing Area Code	
	TXPWR	1	Tx Power	
	DRX	64	Discontinuous reception cycle Length(cycle length : display using ms)	
	MM	19	Mobility Management	
	RRC	0	Radio Resource Control	
	NOM	1	Network Operator Mode	
	BLER	005	Block Error Rate(005 means 0.5 %)	
	CID	2825220	Cell ID (Decimal character format).	
	IMSI	"450050203619261"	International Mobile Station ID	
	NetNameAsc	"SKTelecom"	Operation Name, Quoted string type	
	SD	3	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 : CS+PS)	
	nAST	3	Number of Active Set(Maximum 6)	
	nUARFCN		UARFCN of n th active set	
	nPSC		PSC of n th active set	
	nEc/Io		Ec/Io of n th active Set	
	Note 1 : nAST : Number of active set. Maximum is 6 Note 2 : If nAST value is 1, it means that active set number 1. Module does not display after parameters of nAST. Note 3 : TXPWR of GSM network means 1 tx burst			
AT#RFSTS=?	Test command returns the OK result code.			

5.6.1.32.   Serving Cell Information - #SERVINFO

#SERVINFO - Serving Cell Information	
AT#SERVINFO	Execution command reports informations about serving cell, in the format: (GSM network) #SERVINFO: <B-ARFCN>,<dBM>,<NetNameAsc>,<NetCode>, ,<BSIC>,<LAC>,<TA>,<GPRS>[,[<PB-ARFCN>],[<NOM>], <RAC>,[PAT]] (WCDMA network)

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

5.6.1.33.   Query SIM Status - #QSS

#QSS - Query SIM Status	
AT#QSS= **[<mode>]**	Set command enables/disables the Query SIM Status unsolicited indication in the ME. Parameter: **<mode>** - type of notification 0 - disabled (factory default); it's possible only to query the current SIM status

#QSS - Query SIM Status	

	through Read command **AT#QSS?**
	 1 - enabled; the ME informs at every SIM status change through the following unsolicited indication:
	
	 #QSS: <status>
	
	 where:
	 <status> - current SIM status
	   0 - SIM NOT INSERTED
	   1 - SIM INSERTED
	
	 2 - enabled; the ME informs at every SIM status change through the following unsolicited indication:
	
	 #QSS: <status>
	
	 where:
	 <status> - current SIM status
	   0 - SIM NOT INSERTED
	   1 - SIM INSERTED
	   2 - SIM INSERTED and PIN UNLOCKED
	   3 - SIM INSERTED and READY (SMS and Phonebook access are possible).
	
	 Note: the command reports the SIM status change after the <mode> has been set to 2. We suggest to set <mode>=2 and save the value in the user profile, then power off the module. The proper SIM status will be available at the next power on.

AT#QSS?	Read command reports whether the unsolicited indication **#QSS** is currently enabled or not, along with the SIM status, in the format: **#QSS: <mode>,<status>** (**<mode>** and **<status>** are described above)
AT#QSS=?	Test command returns the supported range of values for parameter **<mode>**.
Example	AT#QSS? #QSS:0,1 OK

5.6.1.34.　Dialling Mode - #DIALMODE

#DIALMODE - Dialling Mode	

AT#DIALMODE=
 [<mode>]
	Set command sets dialling modality.
	
	 Parameter:
	 <mode>
	   0 - (voice call only) **OK** result code is received as soon as it starts remotely ringing (factory default). Any character typed aborts the call and **OK** result code is received.
	   1 - (voice call only) **OK** result code is received only after the called party answers.

#DIALMODE - Dialling Mode	
	Any character typed aborts the call and **OK** result code is received.
	2 - (voice call and data call) The following custom result codes are received, monitoring step by step the call status:
	DIALING (MO in progress)
	RINGING (remote ring)
	CONNECTED (remote call accepted)
	RELEASED (after **ATH**)
	DISCONNECTED (remote hang-up)
	Any character typed aborts the call and **OK** result code is received.
	Note: The setting is saved in NVM and available on following reboot.
AT#DIALMODE?	Read command returns current **ATD** dialing mode in the format: **#DIALMODE: <mode>**
AT#DIALMODE=?	Test command returns the range of values for parameter **<mode>**

5.6.1.35. Automatic Call - #ACAL

#ACAL - Automatic Call	
AT#ACAL= [<mode>]	Set command enables/disables the automatic call function. Parameter: **<mode>** 0 - disables the automatic call function (factory default) 1 - enables the automatic call function. If enabled (and **&D2** has been issued), the transition **OFF/ON** of **DTR** causes an automatic call to the first number (position 0) stored in the internal phonebook. Note: type of call depends on the last issue of command +**FCLASS**.
AT#ACAL?	Read command reports whether the automatic call function is currently enabled or not, in the format: **#ACAL: <mode>** where **<mode>** 0 - automatic call function disabled 1 - automatic call function from internal phonebook enabled 2 - automatic call function from "SM" phonebook enabled (by AT#ACALEXT) 3 - automatic call function from "ME" phonebook enabled (by AT#ACALEXT)
AT#ACAL=?	Test command returns the supported range of values for parameter **<mode>**.
Note	See **&Z** to write and **&N** to read the number on module internal phonebook.

5.6.1.36. Extended Automatic Call - #ACALEXT

#ACALEXT - Extended Automatic Call	

#ACALEXT - Extended Automatic Call	

AT#ACALEXT= <mode>,<index>	Set command enables/disables the extended automatic call function.
	
	Parameters:
	<mode>
	  0 - disables the automatic call function (factory default)
	  1 - enables the automatic call function from internal phonebook.
	  2 - enables the automatic call function from "SM" phonebook.
	  3 - enables the automatic call function from "ME" phonebook.
	<index> - it indicates a position in the currently selected phonebook.
	
	If the extended automatic call function is enabled and **&D2** has been issued, the transition **OFF/ON** of **DTR** causes an automatic call to the number stored in position **<index>** in the selected phonebook.
	
	Note: type of call depends on the last issue of command **+FCLASS**.

AT#ACALEXT?	Read command reports either whether the automatic call function is currently enabled or not, and the last **<index>** setting in the format: **#ACALEXT: <mode>,<index>**
AT#ACALEXT=?	The range of available positions in a phonebook depends on the selected phonebook. This is the reason why the test command returns three ranges of values: the first for parameter **<mode>,** the second for parameter **<index>** when internal phonebook is chosen, the third for parameter **<index>** when "SM" is the chosen phonebook, the fourth for parameter **<index>** when "ME" is the chosen phonebook.
Note	Issuing **#ACALEXT** causes the **#ACAL <mode>** to be changed. Issuing **AT#ACAL**=1 causes the **#ACALEXT <index>** to be set to default. It is recommended to NOT use contemporaneously either **#ACALEXT** and **#ACAL**
Note	See **&Z** to write and **&N** to read the number on module internal phonebook.

5.6.1.37.   Extended Call Monitoring - #ECAM

#ECAM - Extended Call Monitoring	

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

#ECAM - Extended Call Monitoring	

	0 - idle
	1 - calling (MO)
	2 - connecting (MO)
	3 - active
	4 - hold
	5 - waiting (MT)
	6 - alerting (MT)
	7 – busy
	8 – retrieved
	9 – CNAP (Calling Name Presentation) information (MT)
	\<calltype\> - call type
	  1 - voice
	  2 - data
	\<number\> - called number (valid only for **\<ccstatus\>=1**)
	\<type\> - type of **\<number\>**
	  129 - national number
	  145 - international number
	
	Note: the unsolicited indication is sent along with usual codes (**OK**, **NO CARRIER**, **BUSY**...).

AT#ECAM?	Read command reports whether the extended call monitoring function is currently enabled or not, in the format: **#ECAM: \<onoff\>**
AT#ECAM=?	Test command returns the list of supported values for **\<onoff\>**

5.6.1.38.　SMS Overflow – #SMOV

#SMOV - SMS Overflow	

AT#SMOV=
[\<mode\>]
	Set command enables/disables the SMS overflow signalling function.
	
	Parameter:
	\<mode\>
	  0 - disables SMS overflow signaling function (factory default)
	  1 - enables SMS overflow signalling function; when the maximum storage capacity has reached, the following network initiated notification is send:
	
	   #SMOV: \<memo\>

AT#SMOV?	Read command reports whether the SMS overflow signalling function is currently enabled or not, in the format: **#SMOV: \<mode\>**
AT#SMOV=?	Test command returns the supported range of values of parameter **\<mode\>**.
Example	AT#SMOV? #SMOV: 0 OK

5.6.1.39.   Mailbox Numbers - #MBN

#MBN - Mailbox Numbers	

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

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

5.6.1.40.　　Message Waiting Indication - #MWI

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

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

5.6.1.41.   GSM and UMTS Audio Codec - #CODEC

#CODEC - Audio Codec	

AT#CODEC=
[<codec>]
	Set command sets the GSM and UMTS audio codec mode.
	
	Parameter:
	<codec>
	  0 - all the codec modes are enabled (factory default)
	  1..255 - sum of integers each representing a specific codec mode:
	
	    1 - **FR**, full rate mode enabled
	    2 - **EFR**, enhanced full rate mode enabled
	    4 - **HR**, half rate mode enabled
	    8 - **AMR-FR**, AMR full rate mode enabled
	    16 - **AMR-HR**, AMR half rate mode enabled
	    32 - **FAWB**, full rate AMR wideband mode enabled
	    64 – **UAMR2**, UMTS AMR version 2 mode enabled
	    128 – **UAWB**, UMTS AMR wideband mode enabled
	
	Note: the setting 0 is equivalent to the setting 255.
	
	Note: The codec setting is saved in the profile parameters.

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

5.6.1.42.   Network Timezone - #NITZ

#NITZ - Network Timezone	

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

#NITZ - Network Timezone	
	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>**.

5.6.1.43.   Clock management - #CCLK

#CCLK – Clock Management	
AT#CCLK=<time>	Set command sets the real-time clock of the ME. Parameter: <time> - current time as quoted string in the format: "**yy/MM/dd,hh:mm:ss±zz,d**" **yy** - year (two last digits are mandatory), range is 00..99 **MM** - month (two last digits are mandatory), range is 01..12 **dd** - day (two last digits are mandatory) The range for dd(day) depends either on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31) Trying to enter an out of range value will raise an error **hh** - hour (two last digits are mandatory), range is 00..23 **mm** - minute (two last digits are mandatory), range is 00..59 **ss** - seconds (two last digits are mandatory), range is 00..59 **±zz** - time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two last digits are mandatory), range is -47..+48 **d** – number of hours added to the local TZ because of Daylight Saving Time(summertime) adjustment; range is 0-2
AT#CCLK?	Read command returns the current setting of the real-time clock, in the format **<time>.** Note: if the time is set by the network but the DST information is missing, or the time is set by +CCLK command, then the <time> format is: "**yy/MM/dd,hh:mm:ss±zz**"
AT#CCLK=?	Test command returns the **OK** result code.
Example	AT#CCLK="02/09/07,22:30:00+04,1" OK AT#CCLK?

#CCLK – Clock Management	
	#CCLK: 02/09/07,22:30:25+04,1 OK

5.6.1.44.   Select Band - #BND

#BND - Select Band	

AT#BND=
<GSM band>[,
<WCDMA band>]
	Set command selects the current band.
	
	Parameter
	<GSM band>:
	  0 - GSM 900MHz + DCS 1800MHz (UE910-EU factory default)
	  1 - GSM 900MHz + PCS 1900MHz
	  2 - GSM 850MHz + DCS 1800MHz
	  3 - GSM 850MHz + PCS 1900MHz (UE910-NA factory default)
	  4 - GSM 900MHz + DCS 1800MHz + PCS 1900MHz
	  5 - GSM 850MHz + GSM 900MHz + DCS 1800MHz + PCS 1900MHz
	
	  <WCDMA band>:
	  0 - 2100MHz(FDD I)
	  1 - 1900MHz(FDD II)
	  2 - 850MHz(FDD V)
	  3 - 2100MHz(FDD I) + 1900MHz(FDD II) + 850MHz(FDD V)
	  4 - 1900MHz(FDD II) + 850MHz(FDD V) (UE910-NA factory default)
	  5 - 900MHz(FDD VIII)
	  6 - 2100MHz(FDD I) + 900MHz(FDD VIII) (UE910-EU V2 factory default)
	  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)
	
	Note: This setting is maintained even after power off.
	
	Band configuration for UE910 V2 family is as followed
	UE910-EU (FDD I /VIII, GSM 900, GSM1800)
	UE910-NA (FDD II / V, GS850, GSM1900)
	
	Note: not all products support all the values of parameter
	    <GSM band ,<WCDMA band >: please refer to test command to find the
	    supported range of values

AT#BND?	Read command returns the current selected band in the format: **#BND: <GSM band>, <WCDMA band>**
AT#BND=?	Test command returns the supported range of values of parameters **<GSM band>** and **<WCDMA band>**. Note: the range of values differs between triband modules and quadric-band

#BND - Select Band	
	modules

5.6.1.45.   Automatic Band Selection - #AUTOBND

#AUTOBND - Automatic Band Selection	

AT#AUTOBND= [<value>]	Set command returns the **OK** result code.
	
	Parameter:
	<value>:
	  0 – 2 : dummy values (It has no effect and is included only for backward compatibility)
	      Factory default value is 2.
	Note: The function of #BND command included #AUTOBND command.
	If you are needed the #AUTOBND function, you can be done using the command #BND.

AT#AUTOBND?	Read command returns the **OK** result code.
AT#AUTOBND=?	Test command returns the **OK** result code.

5.6.1.46.   Skip Escape Sequence - #SKIPESC

#SKIPESC - Skip Escape Sequence	

AT#SKIPESC= [<mode>]	Set command enables/disables skipping the escape sequence +++ while transmitting during a data connection.
	
	Parameter:
	<mode>
	  0 - doesn't skip the escape sequence; its transmission is enabled (factory default).
	  1 - skips the escape sequence; its transmission is not enabled.
	
	Note: in case of an FTP connection, the escape sequence is not transmitted, regardless of the command setting.

AT#SKIPESC?	Read command reports whether escape sequence skipping is currently enabled or not, in the format: **#SKIPESC: <mode>**
AT#SKIPESC=?	Test command reports supported range of values for parameter **<mode>**.

5.6.1.47.   Escape Sequence Guard Time - #E2ESC

#E2ESC - Escape Sequence Guard Time

#E2ESC - Escape Sequence Guard Time	

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

AT#E2ESC?	Read command returns current value of the escape sequence guard time, in the format: **#E2ESC: <gt>**
AT#E2ESC=?	Test command returns the **OK** result code.

5.6.1.48.   PPP-GPRS Connection Authentication Type - #GAUTH

#GAUTH - PPP-GPRS Connection Authentication Type	

AT#GAUTH=
[<type>]
	Set command sets the authentication type used in PDP Context Activation during PPP-GPRS connections
	
	Parameter
	<type>
	  0 – no authentication
	  1 – PAP authentication(factory default)
	  2 – CHAP authentication
	
	Note: if the settings on the server side(the host application) of the PPP are not compatible with the AT#GAUTH setting, then the PDP Context Activation will use no authentication.

AT#GAUTH?	Read command reports the current PPP-GPRS connection authentication type, in the format: **#GAUTH: <type>**
AT#GAUTH=?	Test command returns the range of supported values for parameter **<type>**.

5.6.1.49.   RTC Status - #RTCSTAT

#RTCSTAT - RTC Status	
AT#RTCSTAT= [<status>]	Set command resets the RTC status flag. Parameter: **<status>** 0 - Set RTC Status to **RTC HW OK** Note: the initial value of RTC status flag is **RTC HW Error** and it doesn't change

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

5.6.1.50.   GSM Antenna Detection - #GSMAD

#GSMAD - GSM Antenna Detection	

**AT#GSMAD=
<mod>,
[<urcmode>
[,<interval>
[,<detGPIO>
[,<repGPIO>]]]]**
	Set command sets the behaviour of antenna detection algorithm
	
	Parameters:
	<mod>
	  0 - detection algorithm not active
	  1 - periodic activation of the antenna detection algorithm; detection is started every **<interval>** period, using **<detGPIO>** for detection; if the algorithm detects a change in the antenna status the module is notified by URC **#GSMAD** (see format below)
	  2 - instantaneous activation of the antenna detection algorithm; if the algorithm detects a change in the antenna status the module is notified by URC (see format below); this instantaneous activation doesn't affect a periodic activation eventually started before. This modality is obsolete and is maintained only for backward compatibility. We suggest to use the modality 3
	
	    URC format:
	
	    #GSMAD: <presence>
	
	    where:
	    <presence>
	      0 - antenna connected.
	      1 - antenna connector short circuited to ground.
	      2 - antenna connector short circuited to power.
	      3 - antenna not detected (open).
	
	  3 - instantaneous activation of the antenna detection algorithm as modality 2 but in this case the command doesn't return until the algorithm ended. The returned value is the antenna <presence> status just detected. Format:
	
	    AT#GSMAD=3
	    #GSMAD: <presence>
	
	    OK

This instantaneous activation doesn't affect a periodic activation eventually
started before, then the output format would be:

AT#GSMAD=3
#GSMAD: <presence>

OK

#GSMAD: <presence> // URC resulting of previous #GSMAD=1

<urcmode> - URC presentation mode. It has meaning only if <mod> is 1.
 0 - it disables the presentation of the antenna detection URC
 1 - it enables the presentation of the antenna detection URC, whenever the antenna
    detection algorithm detects a change in the antenna status; the unsolicited
    message is in the format:

    #GSMAD: <presence>

    where:
    <presence> is as before

<interval> - duration in seconds of the interval between two consecutive antenna
        detection algorithm runs (default is 120). It has meaning only if
        <mod> is 1.
 1..3600 - seconds

<detGPIO> - defines which GPIO shall be used as input by the Antenna Detection
        algorithm. For the <detGPIO> actual range see Test Command

<repGPIO> - defines which GPIO shall be used by the Antenna Detection
        algorithm to report antenna condition. It has meaning only if <mod> is
        1. For the **<repGPIO>** actual range see Test Command.
 0 - no report is made using GPIO

Note: last <urcmode> settings are saved as extended profile parameters.

Note: GPIO is set to LOW when antenna is connected. Set to HIGH otherwise

Note: **#GSMAD** parameters, excluding <urcmode>, are saved in NVM.

AT#GSMAD=?	Test command reports the supported range of values for parameters **<mod>**, **<urcmode>**, **<interval>**, **<detGPIO>** and **<repGPIO>**.
AT#GSMAD?	Read command returns the current parameter settings for **#GSMAD** command in the format: **#GSMAD: <mod>,<urcmode>,<interval>,<detGPIO>,<repGPIO>**

5.6.1.51. Power Saving Mode Ring Indicator - #PSMRI

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

5.6.1.52. SIM Detection Mode-#SIMDET

#SIMDET - SIM Detection Mode	

AT#SIMDET=<mode>	Set command specifies the SIM Detection mode
	
	Parameter:
	<mode> - SIM Detection mode
	  0 - ignore SIMIN pin and simulate the status 'SIM Not Inserted'
	  1 - ignore SIMIN pin and simulate the status 'SIM Inserted'
	  2 - automatic SIM detection through SIMIN Pin (default)

AT#SIMDET?	Read command returns the currently selected Sim Detection Mode in the format:
	
	#SIMDET: <mode>,<simin>
	
	where:
	<mode> - SIM Detection mode, as before
	<simin> - SIMIN pin real status
	  0 - SIM not inserted
	  1 - SIM inserted

AT#SIMDET=?	Test command reports the supported range of values for parameter <mode>

5.6.1.53.   SIM Presence Status - #SIMPR

#SIMPR – SIM Presence Status	
AT#SIMPR= [<mode>]	Set command enables/disables the Query SIM Presence Status unsolicited indication in the ME. This command reports also the status of the remote SIM, if the SAP functionality has been enabled by the **AT#RSEN** command (**AT#RSEN=1**). Parameter: **<mode>** - type of notification 0 - disabled (factory default); it's possible only to query the current SIM status through Read command **AT#SIMPR?** 1 - enabled; the ME informs at every (local and remote) SIM status change through the following unsolicited indication: **#SIMPR: <SIM>,<status>** where: **<SIM>** - local or remote SIM 0 – local SIM 1 – remote SIM **<status>** - current SIM status 0 - SIM NOT INSERTED 1 - SIM INSERTED
AT# SIMPR?	Read command reports whether the unsolicited indication **#SIMPR** is currently enabled or not, along with the local SIM status, in the format: **#SIMPR: <mode>,0,<status>[<CR><LF>** **#SIMPR: <mode>,1,<status>]** (**<mode>**, **<SIM>** and **<status>** are described above)
AT# SIMPR =?	Test command returns the supported range of values for parameter **<mode>**.
Example	AT#SIMPR? #SIMPR: 0,0,1 #SIMPR: 0,1,1 OK

5.6.1.54.   Network Scan Timer - #NWSCANTMR

#NWSCANTMR - Network Scan Timer	
AT#NWSCANTMR= [<tmr>]	Set command sets the Network Scan Timer that is used by the module to schedule the next network search when it is without network coverage (no signal). Parameter: **<tmr>** - timer value in units of seconds 5 3600 - time in seconds (default 5 secs.)
AT#NWSCANTMR	Execution command reports time, in seconds, when the next scan activity will be executed. The format is: **#NWSCANTMREXP: <time>**

#NWSCANTMR - Network Scan Timer	
	Note: if **<time>** is zero it means that the timer is not running
AT#NWSCANTMR?	Read command reports the current parameter setting for **#NWSCANTMR** command in the format: **#NWSCANTMR: <tmr>**
AT#NWSCANTMR=?	Test command reports the supported range of values for parameter **<tmr>**
Note	How much time it takes to execute the network scan depends either on how much bands have been selected and on network configuration (mean value is 5 seconds)

5.6.1.55.   Command Mode Flow Control - #CFLO

#CFLO – Command Mode Flow Control	

AT#CFLO=
<mode>
	Set command enables/disables the flow control in command mode. If enabled, current flow control is applied to both command mode and data mode.
	
	Parameter:
	<mode>
	  0 – Disable flow control set in command mode (factory default)
	  1- Enable flow control set in command mode
	
	Note: This behavior is valid only for Main UART port.

AT#CFLO?	Read command reports current setting value , in the format: **#CFLO: <mode>**
AT#CFLO=?	Test command reports the range of supported values for parameter **<mode>**

5.6.1.56.   I2C data via GPIO - #I2CWR

#I2CWR – Write to I2C	
AT#I2CWR= <sdaPin>, <sclPin>, <deviceId>, <registerId>, <len>	This command is used to Send Data to an I2C peripheral connected to module GPIOs **<sdaPin>**: GPIO number for SDA . Valid range is "any input/output pin" (see "Hardware User's Guide".) **<sclPin>**: GPIO number to be used for SCL. Valid range is "any output pin" (see "Hardware User's Guide"). **<deviceId>**: address of the I2C device, without the LSB used for read\write command, 10 bit addressing supported. Value has to be written in hexadecimal form (without 0x). **<registerId>**: Register to write data to , range 0..255. Value has to be written in hexadecimal form (without 0x). **<len>**: number of data to send. Valid range is 1-254.

#I2CWR – Write to I2C	
	The module responds to the command with the prompt '>' and awaits for the data to send. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). Data shall be written in Hexadecimal Form. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Example if CheckAck is set and no Ack signal was received on the I2C bus **E.g.** AT#I2CWR=2,3,30,10,14 > 00112233445566778899AABBCCDD<ctrl-z> OK Set GPIO2 as SDA, GPIO3 as SCL; Device I2C address is 0x20; 0x10 is the address of the first register where to write I2C data; 14 data bytes will be written since register 0x10 NOTE: At the end of the execution GPIO will be restored to the original setting (check AT#GPIO Command) NOTE: device address, register address where to read from\ write to, and date bytes have to be written in hexadecimal form without 0x.
AT#I2CWR=?	Test command returns the range of each parameter**.**

5.6.1.57.   I2C data from GPIO - #I2CRD

#I2CRD – Read from I2C	
AT#I2CRD= <sdaPin>, <sclPin>, <deviceId>, <registerId>, <len>	This command is used to Read Data from an I2C peripheral connected to module GPIOs **<sdaPin>**: GPIO number for SDA . Valid range is "any input/output pin" (see "Hardware User's Guide".) **<sclPin>**: GPIO number to be used for SCL. Valid range is "any output pin" (see "Hardware User's Guide"). **<deviceId>**: address of the I2C device, without the LSB used for read\write command, 10 bit addressing supported. Value has to be written in hexadecimal form (without 0x). **<registerId>**: Register to read data from , range 0..255. Value has to be written in hexadecimal form (without 0x).

#I2CRD – Read from I2C	
	<len>: number of data to receive. Valid range is 1-254.
	Data Read from I2C will be dumped in Hex:
	E.g. AT#I2CRD=2,3,30,10,14 #I2CRD: 00112233445566778899AABBCCDD
	OK
	NOTE: If data requested are more than data available in the device, dummy data (normally 0x00 or 0xff) will be dumped.
	NOTE: At the end of the execution GPIO will be restored to the original setting (check AT#GPIO Command)
	NOTE: device address, register address where to read from\ write to, and date bytes have to be written in hexadecimal form without 0x.
AT#I2CRD=?	Test command returns the range of each parameter**.**

5.6.1.58.   Show Address - #CGPADDR

#CGPADDR - Show PDP Address	
AT#CGPADDR= [<cid>[,<cid> [,…]]]	Execution command returns a list of PDP addresses for the specified context identifiers in the format: **#CGPADDR: <cid>,<PDP_addr>[<CR><LF>#CGPADDR: <cid>, <PDP_addr>[…]]** Parameters: **<cid>** - Context identifier 1..5 - A numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). If no **<cid>** is specified, the addresses for all defined contexts are returned. **<PDP_addr>** - a string that identifies the terminal in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the **+CGDCONT** command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**; **<PDP_addr>** is omitted if none is available
AT#CGPADDR=?	Test command returns a list of defined **<cid>**s.
Example	AT#GPRS=1 +IP: xxx.yyy.zzz.www OK

#CGPADDR - Show PDP Address	
	AT#CGPADDR=1 #CGPADDR: 1,"xxx.yyy.zzz.www" OK AT#CGPADDR=? #CGPADDR: (1) OK
Reference	3GPP TS 27.007

5.6.1.59.   Call Establishment Lock - #CESTHLCK

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

5.6.1.60.   Battery And Charger Status - #CBC

#CBC- Battery And Charger Status	

AT#CBC	Execution command returns the current Battery and Charger state in the format:
	
	 #CBC: <ChargerState>,<BatteryVoltage>
	
	 where:
	 <ChargerState> - battery charger state
	  0 - charger not connected
	  1 - charger connected and charging
	  2 - charger connected and charge completed
	 <BatteryVoltage> - battery voltage in millivolt: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage.
	
	 NOTE: '1' and '2' at <ChargerState> is not supported.

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

5.6.1.61. Report concatenated SMS indexes - #CMGLCONCINDEX

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

5.6.1.62. 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

5.6.1.63. Hardware Identification - #HWREV

#HWREV – Hardware revision	
AT#HWREV	Execution command returns the device Hardware revision identification code withou command echo.
AT#HWREV=?	Test command returns the **OK** result code.

5.6.1.64. Delete All Phonebook Entries - #CPBD

#CPBD - Delete All Phonebook Entries	
AT#CPBD	Execution command deletes all phonebook entries in the current phonebook memor y storage selected with **+CPBS**.

#CPBD - Delete All Phonebook Entries	
	Note: in case of SM or ME, it takes some time to delete all its entries.
AT# CPBD=?	Test command returns the OK result code.

5.6.1.65.   Connected line identification restriction - #COLR

#COLR – Connected line identification restriction	

AT#COLR=[<n>]	Set command interrogate, activate or deactivate of the COLR service on the network
	
	Parameter:
	<n>
	  0 – interrogate
	   1 – activate
	   2 – deactivate

AT#COLR?	Read command returns the presentation status of the COLR service on the network.
	
	#COLR: <n>
	Where,
	<n>
	   0 – COLR not provisioned
	   1 – COLR provisioned
	   2 – unknown (e.g. no network, etc.)

AT#COLR=?	Test command returns supported parameters **<n>**

5.6.1.66.   Enhanced call tone disable - #ECTD

#ECTD – Enhanced call tone disable	

AT#ECTD=
[<type>]
	Set command sets to disable related with call tone according to **<type>** parameter.
	
	Parameter:
	<type> - sum of integers each representing a type of call tones which the command refers to
	  0 – Not disable call tones
	  1 – Call end tone

AT#ECTD?	Read command returns the current type of disabled call tone: **#ECTD: <type>**
AT#ECTD=?	Test command reports the range for the parameter **<type>**

5.6.1.67.   Call Forwarding Flags - #CFF

#CFF – Call Forwarding Flags	
AT#CFF=<enable>	Set Command enable/disables the presentation of the **call forwarding flags** URC. Parameter: **<enable>**

#CFF – Call Forwarding Flags	
	0 – disable the presentation of the **#CFF** URC (default value) 1 – enable the presentation of the **#CFF** URC each time the Call Forwarding Unconditional(CFU) SS seting is changed or checked and, all startup, the presentation of the status of the **call forwarding flags**, as they are currently stored on SIM. The URC format is: **#CFF: <status>[,<fwdtonum>]** Where: **<status>** 0 – CFU disabled 1 – CFU enabled **<fwdtonum>** - number incoming call are forwarded to NOTE: If SIM didn't support EFCFIS (Call Forwarding Indication Status), URC of #CFF is not displaying. NOTE: If there are no information about call forwarding on SIM, URC of #CFF is not displaying. That time you should request query about call forwarding to network .(refer to AT+CCFC command)
AT#CFF?	Read command reports whether the presentation of the **call forwardings flags** URC is currently enabled or not, if the flags field is present in the SIM, the current status of the **call forwarding flags** as they are currently stored on SIM, and the number incoming calls are forwarded to. The format is: **#CFF: <enable>[,<status>,<fwdtonum>]**
AT#CFF=?	Test command returns the range of available values for parameter **<enable>**.

5.6.1.68.   Codec Information - #CODECINFO

#CODECINFO – Codec Information	
AT#CODECINFO[=<format>[, <mode>]]	This command is both a set and an execution command. Set command enables/disables codec information reports depending on the parameter **<mode>**, in the specified **<format>**. Parameters: **<format>** 0 – numeric format (default) 1 – textual format **<mode>** 0 - disable codec information unsolicited report (default) 1 - enable codec information unsolicited report only if the codec changes

#CODECINFO – Codec Information	
	2 - enable short codec information unsolicited report only if the codec changes

If **<mode>=1** the unsolicited channel mode information is reported in the following format:

    (if **<format>=0**)
    #CODECINFO: <codec_used>,<codec_set>

    (if **<format>=1**)
    #CODECINFO: <codec_used>,<codec_set1>
    [,<codec_set2>[..[,codec_setn]]]

If **<mode>=2** the unsolicited codec information is reported in the following format:

    #CODECINFO: <codec_used>

The reported values are described below.

Execution command reports codec information in the specified **<format>**.

(if **<format>=0**)
#CODECINFO: <codec_used>,<codec_set>

(if **<format>=1**)
#CODECINFO: <codec_used>,<codec_set1>

[,<codec_set2>[..[,codec_setn]]]

The reported values are:

    (if **<format>=0**)
    <codec_used> - one of the following channel modes:
     0 – no TCH
     1 - full rate speech 1 on TCH
     2 - full rate speech 2 on TCH
     4 - half rate speech 1 on TCH
     8 - full rate speech 3 – AMR on TCH
     16 - half rate speech 3 – AMR on TCH
     128 – full data 9.6
     129 – full data 4.8
     130 – full data 2.4
     131 – half data 4.8
     132 – half data 2.4
     133 – full data 14.4
     134 – full rate AMR wide band
     135 – UMTS AMR version 2 |

#CODECINFO – Codec Information	

	136 – UMTS AMR wide band
	
	<codec_set>
	  1..255 - sum of integers each representing a specific codec mode:
	    1 - FR, full rate mode enabled
	    2 - EFR, enhanced full rate mode enabled
	    4 - HR, half rate mode enabled
	    8 - FAMR, AMR full rate mode enabled
	    16 - HAMR, AMR half rate mode enabled
	    32 – **FR-AMR-WB**, full rate AMR wide band
	    64 – UMTS-AMR-V2, UMTS AMR version 2
	    128 – UMTS-AMR-WB, UMTS AMR wide band
	
	(if **<format>=1**)
	<codec_used> - one of the following channel modes:
	  None – no TCH
	  FR - full rate speech 1 on TCH
	  EFR - full rate speech 2 on TCH
	  HR - half rate speech 1 on TCH
	  FAMR - full rate speech 3 – AMR on TCH
	  HAMR - half rate speech 3 – AMR on TCH
	  FD96 - full data 9.6
	  FD48 - full data 4.8
	  FD24 - full data 2.4
	  HD48 - half data 4.8
	  HD24 - half data 2.4
	  FD144 - full data 14.4
	  FAWB - full rate AMR wide band
	  UAMR2 – UMTS AMR version 2
	  UAWB – UMTS AMR wide band
	
	  <codec_set*n*>
	  FR - full rate mode enabled
	  EFR - enhanced full rate mode enabled
	  HR - half rate mode enabled
	  FAMR - AMR full rate mode enabled
	  HAMR - AMR half rate mode enabled
	  FAWB, full rate AMR wide band
	  UAMR2 - UMTS AMR version 2
	  UAWB - UMTS AMR wide band
	
	Note: The command refers to codec information in speech call and to channel mode in data call.
	
	Note: if AT#CODEC is 0, the reported codec set for **<format>=0** is 255 (all

#CODECINFO – Codec Information	
	codec).
AT#CODECINFO?	Read command reports **\<format\>** and **\<mode\>** parameter values in the format: **#CODECINFO: \<format\>,\<mode\>**
AT#CODECINFO=?	Test command returns the range of supported **\<format\>** and **\<mode\>**.

5.6.1.69.   Set Encryption Algorithm - #ENCALG

#ENCALG – Set Encryption Algorithm	
AT#ENCALG=[\<encGSM\>][, \<encGPRS\>]	This command enables or disables the GSM and/or GPRS encryption algorithms supported by the module. Parameters: **\<encGSM\>:** 0 – no GSM encryption algorithm Sum of integers each representing a specific GSM encryption algorithm: (Default value is 5 to PTCRB certification) 1 – A5/1 2 – A5/2 4 – A5/3 8 – A5/4 16 – A5/5 32 – A5/6 64 – A5/7 255 - reset the default values **\<encGPRS\>:** 0 – no GPRS encryption algorithm Sum of integers each representing a specific GPRS encryption algorithm: (Default value is 7 to PTCRB certification) 1 – GEA1 2 – GEA2 4 – GEA3 8 – GEA4 16 – GEA5 32 – GEA6 64 – GEA7 255 - reset the default values Note: the values are stored in NVM and available on following reboot. Note: For possible \<encGSM\> encryptions see test command response
AT#ENCALG?	Read command reports the currently selected **\<encGSM\>** and

#ENCALG – Set Encryption Algorithm	
	<encGPRS>, and the last used <useGSM> and <useGPRS> in the format: **#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>** Parameters: **<usedGSM>:** 0 – no GSM encryption algorithm 1 – A5/1 2 – A5/2 4 – A5/3 8 – A5/4 16 – A5/5 32 – A5/6 64 – A5/7 255 - unknown information **<usedGPRS>:** 0 – no GPRS encryption algorithm 1 – GEA1 2 – GEA2 4 – GEA3 8 – GEA4 16 – GEA5 32 – GEA6 64 – GEA7 255 - unknown information
AT#ENCALG=?	Test command reports the supported range of values for parameters in the format: **< encGSM >** and **<encGPRS>**.
Example	AT#ENCALG? #ENCALG: 5,2,1,1 OK AT#ENCALG=5,1 OK *sets the GSM encryption algorithm A5/1 and A5/3, and the GPRS encryption algorithm GEA1.* *It will be available at the next reboot.* AT#ENCALG? #ENCALG: 5,2,1,1 OK

#ENCALG – Set Encryption Algorithm	
	The last two values indicate that the last used GSM encryption algorithm is A5/1 and the last used GPRS encryption algorithm is GEA1 . *After reboot* AT#ENCALG? #ENCALG: 5,1,1,1

5.6.1.70. Subscriber number - #SNUM

#SNUM – Subscriber Number	
AT#SNUM=<index>, <number>[,<alpha>]	Set command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file. Parameter: **<index>** - record number The number of record in the EFmsisdn depends on the SIM. If only **<index>** value is given, then delete the EFmsisdn record in location **<index>** is deleted. **<number>** - string containing the phone number **<alpha>** - alphanumeric string associated to **<number>**. Default value is empty string(""), otherwise the used character set should bo the one selected with +**CSCS**. The string could be written between quotes, the number of characters depends on the SIM. If empty string is given(""), the corresponding **<alpha>** will be an empty string.
AT# SNUM =?	Test command returns **OK** result code.

5.6.1.71. Extended Numeric Error report - #CEER

#CEER – Extended numeric error report	
AT#CEER	Execution command causes the TA to return a numeric code in the format **#CEER: <code>** which should offer the user of the TA a report of the reason for • the failure in the last unsuccessful call setup (originating or answering); • the last call release; • the last unsuccessful GPRS attach or unsuccessful PDP context activation; • the last GPRS detach or PDP context deactivation. Note: if none of the previous conditions has occurred since power up then **0** is reported (i.e. **No error**, see below) **<code>** values as follows

#CEER – Extended numeric error report

Value	Diagnostic
0	No error
1	Unassigned (unallocated) number
3	No route to destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than ACMmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state

#CEER – Extended numeric error report		
	99	Information element non-existent or not implemented
	100	Conditional IE error
	101	Message not compatible with protocol state
	102	Recovery on timer expiry
	111	Protocol error, unspecified
	127	Interworking, unspecified
	GPRS related errors	
	224	MS requested detach
	225	NWK requested detach
	226	Unsuccessful attach cause NO SERVICE
	227	Unsuccessful attach cause NO ACCESS
	228	Unsuccessful attach cause GPRS SERVICE REFUSED
	229	PDP deactivation requested by NWK
	230	PDP deactivation cause LLC link activation Failed
	231	PDP deactivation cause NWK reactivation with same TI
	232	PDP deactivation cause GMM abort
	233	PDP deactivation cause LLC or SNDCP failure
	234	PDP unsuccessful activation cause GMM error
	235	PDP unsuccessful activation cause NWK reject
	236	PDP unsuccessful activation cause NO NSAPI available
	237	PDP unsuccessful activation cause SM refuse
	238	PDP unsuccessful activation cause MMI ignore
	239	PDP unsuccessful activation cause Nb Max Session Reach
	256	PDP unsuccessful activation cause wrong APN
	257	PDP unsuccessful activation cause unknown PDP address or type
	258	PDP unsuccessful activation cause service not supported
	259	PDP unsuccessful activation cause QOS not accepted
	260	PDP unsuccessful activation cause socket error
	Other custom values	
	240	FDN is active and number is not in FDN
	241	Call operation not allowed
	252	Call barring on outgoing calls
	253	Call barring on incoming calls
	254	Call impossible
	255	Lower layer failure
AT#CEER=?	Test command returns **OK** result code.	
Reference	GSM 04.08	

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

#CEERNET – Ext error report for Network reject cause	
AT#CEERNET	Execution command causes the TA to return a numeric code in the format **#CEERNET: <code>**

#CEERNET – Ext error report for Network reject cause	
	which should offer the user of the TA a report for the last mobility management(GMM/MM) or session management(SM) procedure not accepted by the network and a report of detach or deactivation causes from network.

<code> values as follows

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

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

5.6.1.73.   Disable incoming CSD call - #DCSD

#DCSD – Disable incoming CSD call	

AT#DCSD=
<mode>
	Set command sets the incoming CSD call reject.
	
	Parameter:
	<mode>:
	  0 – Disable incoming CSD call reject(factory default)
	  1 – Enable incoming CSD call reject
	
	Note: When incoming CSD call reject is enabled, All incoming CSD call will be rejected with BUSY indicator

AT#DCSD?	Read command returns the current value of parameter **<mode>**. **#DCSD: <mode>**
AT#DCSD=?	Test command returns the supported range of values of parameter **<mode>**.

5.6.1.74.　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 returns the supported range of values of parameter **<lan>**.

5.6.2.　Multisocket AT Commands

5.6.2.1.　Socket Status - #SS

#SS - Socket Status	
AT#SS[=<connId>]	Execution command reports the current status of the socket: **Parameters:** **<connId> - socket connection identifier** 　**1..6** **The response format is:** **#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>** where: **<connId>** - socket connection identifier, as before **<state>** - actual state of the socket: 　0 - Socket Closed. 　1 - Socket with an active data transfer connection. 　2 - Socket suspended. 　3 - Socket suspended with pending data. 　4 - Socket listening. 　5 - Socket with an incoming connection. Waiting for the user accept or shutdown command. 　6 - Scoket resolving DNS. 　7 - Socket connecting. **<locIP>** - IP address associated by the context activation to the socket. **<locPort>** - two meanings: 　-　the listening port if we put the socket in listen mode. 　-　the local port for the connection if we use the socket to connect to a remote

#SS - Socket Status	
	machine. **<remIP>** - when we are connected to a remote machine this is the remote IP address. **<remPort>** - it is the port we are connected to on the remote machine. Note: issuing **#SS<CR>** causes getting information about status of all the sockets; the response format is: **#SS: <connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1>** **<CR><LF>** … **#SS: <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6>**
AT#SS=?	Test command reports the range for parameter **<connId>**.
Example	AT#SS #SS: 1,3,91.80.90.162,61119,88.37.127.146,10510 #SS: 2,4,91.80.90.162,1000 #SS: 3,0 #SS: 4,0 #SS: 5,3,91.80.73.70,61120,88.37.127.146,10509 #SS: 6,0 OK Socket 1: opened from local IP 91.80.90.162/local port 61119 to remote IP 88.37.127.146/remote port 10510 is suspended with pending data Socket 2: listening on local IP 91.80.90.162/local port 1000 Socket 5: opened from local IP 91.80.73.70/local port 61120 to remote IP 88.37.127.146/remote port 10509 is suspended with pending data AT#SS=2 #SS: 2,4,91.80.90.162,1000 OK We have information only about socket number 2

5.6.2.2.   Socket Info - #SI

#SI - Socket Info	
AT#SI[=<connId>]	Execution command is used to get information about socket data traffic. Parameters: **<connId>** - socket connection identifier 1..6

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

5.6.2.3.   Socket Type- #ST

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

#ST – Socket Type	
	#ST: 5,1,1 #ST: 6,1,2 OK *Socket 1 is closed.* *Socket 2 is closed.* *Socket 3 is an UDP dialer.* *Socket 4 is an UDP listener.* *Socket 5 is a TCP dialer.* *Socket 6 is a TCP listener.*

5.6.2.4.   Context Activation - #SGACT

#SGACT - Context Activation	

AT#SGACT=<cid>, <stat>[,<userId>,<pwd>]	Execution command is used to activate or deactivate the specified PDP context.
	
	Parameters:
	<cid> - PDP context identifier
	  1..5 - numeric parameter which specifies a particular PDP context definition
	  (see +CGDCONT command)
	<stat>
	  0 - deactivate the context
	  1 - activate the context
	<userId> - string type, used only if the context requires it
	<pwd> - string type, used only if the context requires it
	
	Note: context activation/deactivation returns ERROR if there is not any socket associated to it (see AT#SCFG).
	
	Note: if the cid was activated already by +CGACT, Activation/ Deactivation with same cid returns error .
	
	Note: It is strongly recommended to use the same command (e.g. **#SGACT**) to activate the context, deactivate it and interrogate about its status.

AT#SGACT?	Returns the state of all the five contexts, in the format:
	
	#SGACT: <cid1>,<Stat1><CR><LF>
	…
	#SGACT: <cid5>,<Stat5>
	
	where:
	<cid*n*> - as **<cid>** before
	<stat*n*> - context status
	  0 - context deactivated
	  1 - context activated

AT#SGACT=?	Reports the range for the parameters **<cid>** and **<stat>**

5.6.2.5.   Socket Shutdown - #SH

#SH - Socket Shutdown	
AT#SH=<connId>	This command is used to close a socket. Parameter: <connId> - socket connection identifier 1..6 Note: socket cannot be closed in states "resolving DNS" and "connecting" (see AT#SS command)
AT#SH=?	Test command reports the range for parameter <connId>.

5.6.2.6.   Socket Configuration - #SCFG

#SCFG - Socket Configuration	

AT#SCFG=
<connId>,<cid>,
<pktSz>,<maxTo>,
<connTo>,<txTo>
	Set command sets the socket configuration parameters.
	
	Parameters:
	<connId> - socket connection identifier
	  1..6
	<cid> - PDP context identifier
	  1..5 - numeric parameter which specifies a particular PDP context definition.
	  (see +CGDCONT command)
	<pktSz> - packet size to be used by the TCP/UDP/IP stack for data sending.
	  0 - automatically chosen by the device(300).
	  1..1500 - packet size in bytes.
	<maxTo> - exchange timeout(or socket inactivity time); if there's no data exchange within this timeout period the connection is closed
	  0 - no timeout
	  1..65535 - timeout value in seconds (default 90 s.)
	<connTo> - connection timeout; if we can't establish a connection to the remote within this timeout period, an error is raised.
	  10..1200 - timeout value in hundreds of milliseconds (default 600)
	<txTo> - data sending timeout; data are sent even if they're less than max packet size , after this period.
	  0 - no timeout
	  1..255 - timeout value in hundreds of milliseconds (default 50)
	  256 – set timeout value in 10 milliseconds
	  257 – set timeout value in 20 milliseconds
	  258 – set timeout value in 30 milliseconds
	  259 – set timeout value in 40 milliseconds
	  260 – set timeout value in 50 milliseconds
	  261 – set timeout value in 60 milliseconds
	  262 – set timeout value in 70 milliseconds
	  263 – set timeout value in 80 milliseconds
	  264 – set timeout value in 90 milliseconds

#SCFG - Socket Configuration	
	Note: these values are automatically saved in NVM.
	Note: if DNS resolution is required, max DNS resolution time(20 sec) has to be considered in addition to **<connTo>**
AT#SCFG?	Read command returns the current socket configuration parameters values for all the six sockets, in the format: **#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1>** **<CR><LF>** **. . .** **#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>** **<CR><LF>**
AT#SCFG=?	Test command returns the range of supported values for all the subparameters.
Example	at#scfg? #SCFG: 1,1,300,90,600,50 #SCFG: 2,2,300,90,600,50 #SCFG: 3,2,250,90,600,50 #SCFG: 4,1,300,90,600,50 #SCFG: 5,1,300,90,600,50 #SCFG: 6,1,300,90,600,50 OK

5.6.2.7.   Socket Configuration Extended – #SCFGEXT

#SCFGEXT - Socket Configuration Extended	

AT#SCFGEXT=
<connId>,
<srMode>,
<recvDataMode>,
<keepalive>
[,<ListenAutoRsp>
[,<sendDataMode>]]
	Set command sets the socket configuration extended parameters.
	
	Parameters:
	<connId> - socket connection identifier
	1..6
	
	<srMode> - SRing unsolicited mode
	0 - Normal (default):
	   SRING : <connId> where <connId> is the socket connection identifier
	1 – Data amount:
	   SRING : <connId>,<recData> where <recData> is the amount of data received on the socket connection number <connId>
	2 - Data view:
	   SRING : <connId>,<recData>,<data> same as before and <data> is data received displayed following <dataMode> value
	3 – Data view with UDP datagram informations:
	   SRING : <sourceIP>,<sourcePort><connId>,<recData>,
	<dataLeft>,<data> same as before with <sourceIP>,<sourcePort> and <dataLeft>

#SCFGEXT - Socket Configuration Extended	
	that means the number of bytes left in the UDP datagram **\<recvDataMode\>** - data view mode for received data in command mode(AT#SRECV or \<srMode\> = 2) 0- text mode (default) 1- hexadecimal mode **\<keepalive\> -** Set the TCP Keepalive value in minutes 0 – Deactivated (default) 1 – 240 – Keepalive time in minutes **\<ListenAutoRsp\>** - Set the listen auto-response mode, that affects the commands AT#SL and AT#SLUDP 0 - Deactivated (default) 1 – Activated **\<sendDataMode\> -** data mode for sending data in command mode(AT#SSEND) 0 - data represented as text (default) 1 - data represented as sequence of hexadecimal numbers (from 00 to FF) Each octet of the data is given as two IRA character long hexadecimal number Note: these values are automatically saved in NVM Note: Keepalive is available only on TCP connections. Note: for the behaviour of AT#SL and AT#SLUDP in case of auto-response mode or in case of no auto-response mode, see the description of the two commands.
AT#SCFGEXT?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT: \<connId1\>,\<srMode1\>,\<dataMode1\>,\<keepalive1\>,** **\<ListenAutoRsp1\>,0\<CR\>\<LF\>** **...** **#SCFGEXT: \<connId6\>,\<srMode6\>,\<dataMode6\>,\<keepalive6\>** **\< ListenAutoRsp6 \>,0**
AT#SCFGEXT=?	Test command returns the range of supported values for all the subparameters
Example	Socket 1 set with data view sring, text data mode and a keepalive time of 30 minutes. Socket 3 set with data amount sring, hex data mode and no keepalive. at#scfgext? #SCFGEXT: 1,2,0,30,0,0 #SCFGEXT: 2,0,0,0,0,0

#SCFGEXT - Socket Configuration Extended	
	#SCFGEXT: 3,1,1,0,0,0 #SCFGEXT: 4,0,0,0,0,0 #SCFGEXT: 5,0,0,0,0,0 #SCFGEXT: 6,0,0,0,0,0 OK

5.6.2.8.   Socket Configuration Extended 2 - #SCFGEXT2

#SCFGEXT2 - Socket Configuration Extended	
AT#SCFGEXT2= <connId>, <bufferStart> [,<abortConnAttempt > [, unused_B> [,<unused_C> [,<noCarrierMode>]]]]	Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command. Parameters: <connId> - socket connection identifier 1..6 <bufferStart> - Set the sending timeout method based on new data received from the serial port. (<txTo> timeout value is set by #SCFG command) Restart of transmission timer will be done when new data are received from the serial port. 0 – old behaviour for transmission timer (#SCFG command 6th parameter old behaviour, start only first time if new data are received from the serial port) 1 – new behaviour for transmission timer : Restart when new data received from serial port Note : is necessary to avoid overlapping of the two methods. Enabling new method, the old method for transmission timer (#SCFG) is automatically disabled to avoid overlapping. Note : check if new data have been received from serial port is done with a granularity that is directly related to #SCFG <txTo> setting with a maximum period of 1 sec. <abortConnAttempt> - Enable connection attempt(#SD / #SKTD) abort before CONNECT (online mode) or OK (command mode) 0 – Not possible to intterupt connection attempt 1 – It is possible to interrupt the connection attempt (<connTo> set by #SCFG or DNS resoultion running if required) And give back control to AT interface by reception of a character. As soon as the control has been given to the AT interface, the ERROR message will be received on the interface itself.

#SCFGEXT2 - Socket Configuration Extended	
	<noCarrierMode> - permits to choose NO CARRIER indication format when the socket is closed as follows 0 – NO CARRIER (default) Indication is sent as usual, without additional information 1 – NO CARRIER:<connId> Indication of current <connId> socket connection identifier is added 2 – NO CARRIER:<connId>,<cause> Indication of current <connId> socket connection identifier and closure <cause> are added For possible <cause> values, see also #SLASTCLOSURE Note: like #SLASTCLOSURE, in case of subsequent consecutive closure causes are received, the original disconnection cause is indicated. Note: in the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote. Note : values are automatically saved in NVM.
AT#SCFGEXT2?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT2: <connId1>,<bufferStart1>,<abortConnAttempt>,0,0,0** **<CR><LF>** **...** **#SCFGEXT2: <connId1>,<bufferStart1>,<abortConnAttempt>,0,0,0**
AT#SCFGEXT2=?	Test command returns the range of supported values for all the subparameters
Example	AT#SCFGEXT2=1,1 OK AT#SCFGEXT2=2,1 OK AT#SCFGEXT2? #SCFGEXT2: 1,1,0,0,0,0 #SCFGEXT2: 2,1,0,0,0,0 #SCFGEXT2: 3,0,0,0,0,0

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

5.6.2.9.   Socket configuration Extended 3 - #SCFGEXT3

#SCFGEXT3 - Socket Configuration Extended 3	
AT#SCFGEXT3= <connId >,<immRsp> [,<unused_A>[,<unus ed_B>[,<unused_C>[, <unused_D>]]]]]]	Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command nor in #SCFGEXT2 command Parameters: <connId> - socket connection identifier **1..6** <immRsp> - Enables AT#SD command mode immediate response 0 – factory default, means that AT#SD in command mode (see **AT#SD**) returns after the socket is connected 1 – means that AT#SD in command mode returns immediately. Then the state of the connection can be read by the AT command **AT#SS** Note: parameter is saved in NVM
AT#SCFGEXT3?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT3:<connId1>,<immRsp1>,0,0,0,0<CR><LF>** . . .

#SCFGEXT3 - Socket Configuration Extended 3	
	#SCFGEXT3:<connId6>,<immRsp6>,0,0,0,0<CR><LF>
AT#SCFGEXT3=?	Test command returns the range of supported values for all the parameters.

5.6.2.10.   Socket Dial – #SD

#SD - Socket Dial	
AT#SD=<connId>, <txProt>,<rPort>, <IPaddr> [,<closureType> [,<lPort> [,<connMode>]]]	Execution command opens a remote connection via socket. Parameters: **<connId>** - socket connection identifier 1..6 **<txProt>** - transmission protocol 0 - TCP 1 - UDP **<rPort>** - remote host port to contact 1..65535 **<IPaddr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query **<closureType>** - socket closure behaviour for TCP 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) **<lPort>** - UDP connections local port 1..65535 (factory default is 0) **<connMode>** - Connection mode 0 - online mode connection (default) 1 - command mode connection Note: **<closureType>** parameter is valid for TCP connections only and has no effect (if used) for UDP connections. Note: **<lPort>** parameter is valid for UDP connections only and has no effect (if used) for TCP connections. Note: if we set **<connMode>** to **online mode connection** and the command is successful we enter in **online data mode** and we see the intermediate result code **CONNECT**. After the **CONNECT** we can suspend the direct interface to the socket connection (nb the socket stays open) using the escape sequence (+++): the module moves back to **command mode** and we receive the final result code **OK** after the suspension. After such a suspension, it's possible to resume it in every moment (unless the socket inactivity timer timeouts, see **#SCFG**) by using the **#SO** command with the corresponding **<connId>**. Note: if we set **<connMode>** to **command mode connection** and the command is successful, the socket is opened and we remain in **command mode** and we see the result code **OK**.

#SD - Socket Dial	
	Note: if there are input data arrived through a connected socket and not yet read because the module entered **command mode** before reading them (after an escape sequence or after **#SD** has been issued with **<connMode>** set to **command mode connection**), these data are buffered and we receive the **SRING** URC (**SRING** presentation format depends on the last **#SCFGEXT** setting); it's possible to read these data afterwards issuing **#SRECV**. Under the same hypotheses it's possible to send data while in **command mode** issuing **#SSEND** Note: resume of the socket(#SO) after suspension or closure(#SH) has to be done on the same instance on which the socket was opened through #SD. In fact, suspension has been done on the instance itself.
AT#SD=?	Test command reports the range of values for all the parameters.
Example	*Open socket 1 in online mode* AT#SD=1,0,80,"www.google.com",0,0,0 CONNECT … *Open socket 1 in command mode* AT#SD=1,0,80,"www.google.com",0,0,1 OK

5.6.2.11.   Socket Restore - #SO

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

5.6.2.12.   Socket Listen - #SL

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

#SL - Socket Listen	
	0 - closes socket listening 1 - starts socket listening **\<listenPort>** - local listening port 1..65535 **\<closure type>** - socket closure behavior for TCP when remote host has closed 0 – local host closes immediately(factory default) 255 – local host closes after an escape sequence (+++) or immediately in case of an abortive disconnect from remote Note: if successful, commands returns a final result code **OK** . Then, when there's an incoming connection on the local port and if the sender is not filtered by internal firewall (see **#FRWL**), an URC is received: **SRING : \<connId>** Afterwards we can use **#SA** to accept the connection or **#SH** to refuse it. If the ListenAutoRsp flag has been set, then, when a TCP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**. If the socket is closed by the network the following URC is received: **#SL: ABORTED** Note: the command **#SCFGEXT** doesn't influence the presentation format of the URC **SRING** Note: when closing the listening socket \<listenPort> is a don't care parameter
AT#SL?	Read command returns all the actual listening sockets.
AT#SL=?	Test command returns the range of supported values for all the subparameters.
Example	Next command opens a socket listening for TCP on port 3500. AT#SL=1,1,3500 OK

5.6.2.13.   UDP SocketListen - #SLUDP

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

#SLUDP – UDP Socket Listen	
	0 - closes socket listening 1 - starts socket listening **<listenPort>** - local listening port 1..65535 Note: if successful, the command returns a final result code **OK**. If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall (see **#FRWL**), an URC is received: **SRING : <connId>** Afterwards it is possible to use **#SA** to accept the connection or **#SH** to refuse it. If the ListenAutoRsp flag has been set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**. If the socket is closed by the network the following URC is received: **#SLUDP: ABORTED** Note: when closing the listening socket <listenPort> is a don't care parameter
AT#SLUDP?	Read command returns all the actual listening sockets.
AT#SLUDP=?	Test command returns the range of supported values for all the subparameters.
Example	Next command opens a socket listening for UDP on port 3500 AT#SLUDP=1,1,3500 OK

5.6.2.14.   Socket Accept - #SA

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

#SA - Socket Accept	
AT#SA=?	Test command reports the range of values for all the parameters.

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

#SLASTCLOSURE – Detect the cause of a socket disconnection	
AT#SLASTCLOSURE= [<connId>]	Execution command reports socket disconnection cause Parameters: <connId> - socket connection identifier 1..6 The response format is: #SLASTCLOSURE: <connId>,<cause> where: <connId> - socket connection identifier, as before <cause> - socket disconnection cause: 0 – not available(socket has not yet been closed) 1.- remote host TCP connection close due to FIN/END: normal remote disconnection decided by the remote application 2 -.remote host TCP connection close due to RST, all others cases in which the socket is aborted without indication from peer (for instance because peer doesn't send ack after maximum number of retransmissions/peer is no more alive). All these cases include all the "FATAL" errors after recv or send on the TCP socket(named as different from EWOULDBLOCK) 3.- socket inactivity timeout 4.- network deactivation(PDP context deactivation from network) Note: any time socket is re-opened, last disconnection cause is reset. Command report 0(not available). Note: user closure cause(#SH) is not considered and if a user closure is performed after remote disconnection, remote disconnection cause remains saved and is not overwritten. Note: if more consecutive closure causes are received, the original disconnection cause is saved. (For instance: if a TCP FIN is received from remote

#SLASTCLOSURE – Detect the cause of a socket disconnection	
	and later a TCP RST because we continue to send data, FIN cause is saved and not overwritten) Note: also in case of **<closureType>**(#SD) set to 255, if the socket has not yet been closed by user after the escape sequence, **#SLASTCLOSURE** indicates remote disconnection cause if it has been received. Note: in case of UDP, cause 2 indicates abnormal(local) disconnection. Cause 3 and 4 are still possible. (Cause 1 is obviously never possible) Note: in case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.
AT#SLASTCLOSURE=?	Test command reports the supported range for parameter **<connId>**

5.6.2.16.   Receive Data In Command Mode - #SRECV

#SRECV – Received Data in Command Mode	

AT#SRECV=
<connId>,
<maxByte>
[,<UDPInfo>]
	Execution command permits the user to read data arrived through a connected socket, but buffered and not yet read because the module entered **command mode** before reading them; the module is notified of these data by a **SRING** URC, whose presentation format depends on the last **#SCFGEXT** setting.
	
	 Parameters:
	 <connId> - socket connection identifier
	 1..6
	 <maxByte> - max number of bytes to read
	 1..1500
	 <UDPInfo>
	  0 – UDP information disabled (default)
	  1 – UDP information enabled: data are read just until the end of the UDP datagram and the response carries information about the remote IP address and port and about the remaining bytes in the datagram.
	 AT#SRECV=<connId>,<maxBytes>,1
	 #SRECV: <sourceIP>,<sourcePort><connId>,<recData>,
	 <dataLeft>
	 data
	
	 Note: issuing **#SRECV** when there's no buffered data raises an error.

AT#SRECV=?	Test command returns the range of supported values for parameters **<connId> <maxByte>** and **<UDPInfo>**

#SRECV – Received Data in Command Mode	
Example	**SRING URC (<srMode> be 0, <dataMode> be 0)** *telling data have just come through connected socket identified by <connId>=1 and are now buffered* SRING: 1 *Read in text format the buffered data* AT#SRECV=1,15 #SRECV: 1,15 stringa di test OK *Or:* *if the received datagram, received from <IPaddr and <IPport> is of 60 bytes* AT#SRECV=1,15,1 #SRECV: <IPaddr>,<IPport>,1,15 stringa di test OK **SRING URC (<srMode> be 1, <dataMode> be 1)** *telling 15 bytes data have just come through connected socket identified by <connId>=2 and are now buffered* SRING: 2,15 *Read in hexadecimal format the buffered data* AT#SRECV=2,15 #SRECV: 2,15 737472696e67612064692074657374 OK *Or:* *if the received datagram, received from <IPaddr and <IPport> is of 60 bytes* AT#SRECV=2,15 #SRECV: <IPaddr>,<IPport>,2,15 737472696e67612064692074657374 OK **SRING URC (<srMode> be 2, <dataMode> be 0)** *displaying (in text format) 15 bytes data that have just come through connected socket identified by <connId>=3; it's no necessary to issue #SRECV to read the data; no data remain in the buffer after this URC* SRING: 3,15, stringa di test

5.6.2.17.   Send Data In Command Mode - #SSEND

#SSEND – Send Data in Command Mode	
AT#SSEND= <connId>	Execution command permits, while the module is in **command mode,** to send data through a connected socket.

#SSEND – Send Data in Command Mode	
	Parameters: **<connId>** - socket connection identifier 1..6 The device responds to the command with the prompt '>' and waits for the data to send. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported Note: the maximum number of bytes to send is 1024; trying to send more data will cause the surplus to be discarded and lost. Note: it's possible to use **#SSEND** only if the connection was opened by **#SD**, else the ME is raising an error Note: a byte corresponding to BS char(0x08) is treated with its corresponding meaning; therefore previous byte will be cancelled(and BS char itself will not be sent)
AT#SSEND=?	Test command returns the range of supported values for parameter **< connId >**
Example	*Send data through socket number 2* AT#SSEND=2 >Test<CTRL-Z> OK

5.6.2.18.   Send Data In Command Mode extended - #SSENDEXT

#SSENDEXT – Send Data in Command Mode extended	
AT#SSENDEXT= <connId>,<bytestosen d>	Execution command permits, while the module is in **command mode,** to send data through a connected socket including all possible octets(from 0x00 to 0xFF). Parameters: **<connId>** - socket connection identifier 1..6 **<bytestosend>** - number of bytes to be sent Please refer to test command for range The device responds to the command with the prompt '> ' <greater_than><space> and waits for the data to send. When <bytestosend> bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: it's possible to use **#SSENDEXT** only if the connection was opened by **#SD**,

#SSENDEXT – Send Data in Command Mode extended	
	else the ME is raising an error Note: all special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and don't behave like a BS, i.e. previous character is not deleted)
AT#SSENDEXT=?	Test command returns the range of supported values for parameters **<connId>** and **<bytestosend>**

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

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

#SSENDUDP – send UDP data to a specific remote host	
AT#SSENDUDP=<connId>,<remoteIP>,<remotePort>	This command permits, while the module is in command mode, to send data over UDP to a specific remote host. UDP connection has to be previously completed with a first remote host through **#SLUDP** / **#SA**. Then, if we receive data from this or another host, we are able to send data to it. Like command **#SSEND**, the device responds with '> ' and waits for the data to send. Parameters: **<connId>** - socket connection identifier 1..6 **<remoteIP>** - IP address of the remote host in dotted decimal notation, string type: "xxx.xxx.xxx.xxx" **<remotePort>** - remote host port 1..65535 Note: after SRING that indicates incoming UDP data and issuing **#SRECV** to receive data itself, through **#SS** is possible to check last remote host (IP/Port). Note: if successive resume of the socket to online mode Is performed(**#SO**), connection with first remote host

#SSENDUDP – send UDP data to a specific remote host	
	is restored as it was before.
AT#SSENDUDP=?	Test command reports the supported range of values for parameters **<connId>**,**<remoteIP>** and **<remotePort>**
Example	*Starts listening on <LocPort>(previous setting of firewall through #FRWL has to be done)* AT#SLUDP=1,1,<LocPort> OK SRING: 1 *// UDP data from a remote host available* AT#SA=1,1 OK SRING: 1 AT#SI=1 #SI: 1,0,0,23,0 *// 23 bytes to read* OK AT#SRECV=1,23 #SRECV:1,23 message from first host OK AT#SS=1 #SS: 1,2,<LocIP>,<LocPort>,<RemIP1>,<RemPort1> OK AT#SSENDUDP=1,<RemIP1>,<RemPort1> >response to first host OK SRING: 1 *// UDP data from a remote host available* AT#SI=1 #SI: 1,22,23,24,0 *// 24 bytes to read* OK AT#SRECV=1,24 #SRECV:1,24 message from second host OK AT#SS=1

#SSENDUDP – send UDP data to a specific remote host	
	#SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2> OK *Remote host has changed, we want to send* *a reponse:* AT#SSENDUDP=1,<RemIP2>,<RemPort2> >response to second host OK

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

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

5.6.2.21.   IP Easy Authentication Type - #SGACTAUTH

#SGACTAUTH – Easy GPRS Authentication Type	
AT#SGACTAUTH= <type>	Set command sets the authentication type for IP Easy This command has effect on the authentication mode used on AT#SGACT or AT#GPRS commands.

#SGACTAUTH – Easy GPRS Authentication Type	
	Parameter <type> 0 - no authentication 1 - PAP authentication (factory default) 2 - CHAP authentication Note: the parameter is not saved in NVM
AT#SGACTAUTH?	Read command reports the current Easy GPRS authentication type, in the format: **#SGACTAUTH: <type>**
AT#SGACTAUTH=?	Test command returns the range of supported values for parameter **<type>.**

5.6.2.22.   Context activation and configuration - #SGACTCFG

#SGACTCFG – Context Activation and Configuration	
AT#SGACTCFG= <cid>, <retry>, [,<delay> [,<urcmode>]]	Execution command is used to enable or disable the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every **GPRS Attach** or after a **NW PDP CONTEXT deactivation** if al least one IPEasy socket is configured to this context (see AT#SCFG). Parameters: <**cid**> - PDP context identifier 1..5 – numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) <**retry**> - numeric parameter which specifies the maximum number of context activation attempts in case of activation failure. The value belongs to the following range: 0 – 15 0 – disable the automatic activation/reactivation of the context (default) <**delay**> - numeric parameter which specifies the delay in seconds between an attempt and the next one. The value belongs to the following range: 180 – 3600 <**urcmode**> - URC presentation mode 0 – disable unsolicited result code (default) 1 – enable unsolicited result code, after an automatic activation/reactivation, of the local IP address obtained from the network. It has meaning only if <**auto**>=1(refer to AT#AUTOATT). The unsolicited message is in the format: **#SGACT: <ip_address>** Reporting the local IP address obtained from the network.

#SGACTCFG – Context Activation and Configuration	
	Note: the URC presentation mode <**urcmode**> is related to the current AT instance only. Last <**urcmode**> setting is saved for every instance as extended profile parameter, thus it is possible to restore it even if the multiplexer control channel is released and set up, back and forth. Note: <**retry**> and <**delay**> setting aer global parameter saved in NVM. Note: if the automatic activation is enabled on a context, then it is not allowed to modify by the command AT#SCFG the association between the context itself and the socket connection identifier all the other parameters of command AT#SCFG are modifiable while the socket is not connected.
AT#SGACTCFG?	Read command reports the state of all the six contexts, in the format: **#SGACTCFG: <cid1>,<retry1>,<delay1>,<urcmode><CR><LF>** **…** **#SGACTCFG: <cid6>,<retry6>,<delay6>,<urcmode>** where: <**cid***n*> - as <**cid**> before <**retry***n*> - as <**retry**> before <**delay***n*> - as <**delay**> before <**urcmode**> - as <**urcmode**> before
AT#SGACTCFG=?	Test command returns the range of supported values for parameters <**cid**>,<**retry**>,<**delay**> and <**urcmode**>

5.6.2.23.   Context activation and configuration extended - #SGACTCFGEXT

#SGACTCFGEXT – Context Activation and Configuration	
AT#SGACTCFGEXT= <**cid**>, <**abortAttemptEnable**>, [,<**unused**> [,<**unused**> [,<**unused**>]]]	Execution command is used to enable new features related to context activation. Parameters: <**cid**> - PDP context identifier 1..5 – numeric parameter which specifies a particular PDP context definition (see +CGDCONT command) <**abortAttemptEnable**> 0 – old behavior: no abort possible while attempting context activation 1 – abort during context activation attempt is possible by sending a byte on the serial port. It takes effect on successive GPRS context activation attempt through #SGACT command in the following manner. While waiting for AT#SGACT=<cid>,1 response (up to 150s), it is possible to abort attempt by sending a byte and get back AT interface control (NO CARRIER indication).

#SGACTCFGEXT – Context Activation and Configuration	
	Note: If we receive delayed CTXT ACTIVATION ACCEPT after abort, network will be automatically informed of our aborted attempt through relative protocol messages (SM STATUS) and will also close on its side. Otherwise, if no ACCEPT is received after abort, network will be informed later of our PDP state through other protocol messages (routing area update for instance). Note: values are automatically saved in NVM.
AT#SGACTCFGEXT?	Read command reports the state of all the six contexts, in the format: **#SGACTCFGEXT: <cid1>,<abortAttemptEnable1>,,0,0,0<CR><LF>** **…** **#SGACTCFGEXT: <cid6>,<abortAttemptEnable6>,,0,0,0** where: <**cid***n*> - as <**cid**> before <**abortAttemptEnable***n*> - as <**abortAttemptEnable**> before
AT#SGACTCFGEXT=?	Test command reports supported range of values for all parameters

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

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

#BASE64 – Base64 encoding/decoding of socket sent/received data	
	1 - MIME RFC2045 base64 decoding of data received from socket <connId> and sent to serial port. (Same rule as for <enc> regarding line feeds in the received file that has to be decoded) 2 - RFC3548 base64 decoding of data received from socket <connId> and sent to serial port. (Same rule as for <enc> regarding line feeds in the received file that has to be decoded) Note: it is possible to use command to change current <enc>/<dec> settings for a socket already opened in command mode or in online mode after suspending it. (In this last case obviously it is necessary to set AT#SKIPESC=1). Note: to use #BASE64 in command mode, if data to send exceed maximum value for #SSENDEXT command, they have to be divided in multiple parts. These parts have to be a multiple of 57 bytes, except for the last one, to distinguish EOF condition. (Base64 encoding rules) For the same reason if #SRECV command is used by the application to receive data, a multiple of 78 bytes has to be considered. Note: to use #SRECV to receive data with <dec> enabled, it is necessary to consider that: reading <maxByte> bytes from socket, user will get less due to decoding that is performed. Note: values are automatically saved in NVM.
AT#BASE64?	Read command returns the current <enc>/<dec> settings for all the six sockets, in the format: **#BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>** **. . .** **#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>**
AT#BASE64=?	Test command returns the range of supported values for all the subparameters.
Example	AT#SKIPESC=1 OK AT#SD=<connId>,<txProt>,<rPort>,<IPaddr> CONNECT //Data sent without modifications(default) ……… +++ (suspension)

#BASE64 – Base64 encoding/decoding of socket sent/received data	
	OK
	at#base64=<connId>,1,0
	OK
	AT#SO=<connId>
	CONNECT
	// Data received from serial port are encoded
	// base64 before to be sent on the socket
	………………
	+++ (suspension)
	OK
	at#base64=<connId>,0,1
	OK
	AT#SO=<connId>
	CONNECT
	// Data received from socket are decoded
	// base64 before to be sent on the serial port
	+++ (suspension)
	…………………

5.6.3.   SSL AT Commands

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

#SSLCFG – Configure general parameters of a SSL socket	
AT#SSLCFG=<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>[,<UNUSED_4>]]]]	This command allows configuration SSL connection parameters. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manages only one socket **<cid>** - PDP Context Identifier 1 – Until now only context one is supported **<pktSz>** - packet size to be used by the SSL/TCP/IP stack for data sending. 0 – select automatically default value(300). 1..1500 – packet size in bytes. **<maxTo>** - exchange timeout(or socket inactivity timeout); in online mode, if there's no data exchange within this timeout period the connection is closed. 0 – no timeout 1..65535 – timeout value in seconds(default 90 s).

#SSLCFG – Configure general parameters of a SSL socket	
	<defTo> - Timeout that will be used by default whenever the corresponding parameter of each command is not set. 10..5000 – Timeout in tenth of seconds(default 100). **<txTo>** - data sending timeout; in online mode after this period data are sent also if they're less than max packet size. 0 – no timeout 1..255 – timeout value in hundreds of milliseconds(default 50). Note: if secure socket is not enabled using **#SSLEN** only test requests can be made. Read command can be issued if at least a <SSId> is enabled. Note: these values are automatically saved in NVM.
AT#SSLCFG?	Read command reports the currently selected parameters in the format: **#SSLCFG: <SSId1>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>,0,0,0,0**
AT#SSLCFG=?	Test command returns the range of supported values for all the parameters. **#SSLCFG: (1),(1),(0-1500),(0-65535),(10-5000),(0-255),(0),(0),(0),(0)**

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

#SSLD – Opens a socket SSL to a remote server	
AT#SSLD=<SSId>,<rPort>,<IPAddress>,<ClosureType>[,<connMode>[,<Timeout>]]	Execution command opens a remote connection via socket secured through SSL. Both command and online modes can be used. In the first case '**OK**' is printed on success, and data exchange can be performed by means of **#SSLSEND** and **#SSLRECV** commands. In online mode '**CONNECT**' message is printed, and data can be sent/received directly to/by the serial port. Communication can be suspended by issuing the escape sequence(by default +++) and restored with **#SSLO** command. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket **<rPort>** - Remote TCP port to contact 1..65535 **<IPAddress>** - string type, address of SSL server **<ClosureType>** - how to close SSL socket 0 – only value 0 is supported **<connMode>** - connection mode 0 – online mode connection

#SSLD – Opens a socket SSL to a remote server	
	1 – command mode connection(factory default).
	<Timeout> - time-out in 100 ms units. It represents the TCP inter-packet delay.
	Note: it **DOES NOT** represent the total handshake timeout.
	10..5000 – hundreds of ms(factory default is 100)
	Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made.
	Note: if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used.
	Note: in online mode the socket is closed after an inactivity period(configurable with **#SSLCFG**, with a default value of 90 seconds), and the '**NO CARRIER**' message is printed.
	Note: Before opening a SSL connection the GPRS context must have been activated by AT#SGACT=x,1.
	Note: in online mode data are transmitted as soon as the data packet size is reached or as after a transmission timeout. Both these parameters are configurable by using **#SSLCFG**.
	Note: Before opening a SSL connection, make sure to have stored the needed secure data(CA certificate), using **AT#SSLSECDATA**.
	Note: if connMode is 1 and there are some receiving data from server, URC "SRING: SS_id" will be shown.
AT#SSLD=?	Test command returns the range of supported values for all the parameters: **#SSLD: (1),(1-65535),,(0),(0,1),(10-5000)**

5.6.3.3.   Enabling a SSL socket - #SSLEN

#SSLEN – Enable a SSL socket	
AT#SSLEN=<SSId>, <Enable>	This command enables a socket secured by SSL
	Parameters:
	<SSId> - Secure Socket Identifier
	1 – Until now SSL block manages only one socket
	<Enable>
	0 – deactivate secure socket [default]
	1 – activate secure socket
	Note: if secure socket is not enabled only test requests can be made for every SSL command except #SSLS(SSL Status) which can be issued also if the

#SSLEN – Enable a SSL socket	
	socket is disabled. Read commands can be issued if at least a <SSId> is enabled. Note: these values are automatically saved in NVM. Note: an error is raised if #SSLEN=X,1 is issued when the socket 'X' is already enabled and if #SSLEN=X,0 is issued when the socket 'X' is already disabled. Note: a SSL socket cannot be disabled by issuing #SSLEN=1 if it is connected.
AT#SSLEN?	Read command reports the currently enable status of secure socket in the format: **#SSLEN: <SSId>,<Enable><CR><LF>** **<CR><LF>** **OK**
AT#SSLEN=?	Test command returns the range of supported values for all the parameters: **#SSLEN: (1),(0,1)**

5.6.3.4.   Closing a SSL socket - #SSLH

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

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

#SSLO – Restore a SSL socket after a +++	
AT#SSLO=<SSId>	This command allows to restore a SSL connection(online mode) suspended by an escape sequence(+++). After the connection restore, the **CONNECT** message is printed.

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

5.6.3.6.   Reading data from a SSL socket - #SSLRECV

#SSLRECV – Read data from a SSL socket	
AT#SSLRECV=<SSId>,<MaxNumByte>[, <TimeOut>]	This command allows receiving data from a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket **<MaxNumByte>** - max number of bytes to read 1..1000 **<Timeout>** - time-out in 100 ms units 10..5000 – hundreds of ms(factory default is 100) If no data are received the device respondes: **#SSLRECV: 0<CR><LF>** **TIMEOUT<CR><LF>** **<CR><LF>** **OK** If the remote host closes the connection the device respondes: **#SSLRECV: 0<CR><LF>** **DISCONNECTED<CR><LF>** **<CR><LF>** **OK** If data are received the device respondes: **#SSLRECV: NumByteRead<CR><LF>** **…(Data read)…<CR><LF>** **<CR><LF>** **OK**

#SSLRECV – Read data from a SSL socket	
	Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set through **AT#SSLCFG**, is used. Note: before receiving data from the SSL connection it has to be established using **AT#SSLD**.
AT#SSLRECV=?	Test command returns the range of supported values for all the parameters: **#SSLRECV: (1),(1-1000),(10-5000)**

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

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

5.6.3.8. Managing the security data - #SSLSECDATA

#SSLSECDATA – Manage the security data	
AT#SSLSECDATA= <SSId>,<Action>,<Da taType>[,<Size>]	This command allows to store, delete and read security data(Certificate, CACertificate, Private key) into NVM. Parmaters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manages only one socket. **<Action>** - Action to do. 0 – Delete data from NVM 1 – Store data into NVM 2 – Read data from NVM **<DataType>** 0 – Certificate 1 – CA Certificate 2 – RSA Private key **<Size>** - Size of security data to be stored 1..2047 If the <Action> parameter si 1(store data into NVM) the device responds to the command with the prompt '>' and waits for the data to store. To complete the operation send CTRL-Z char(0x1A hex); to exit without writing the message send ESC char(0x1B hex). If data are successfully stored, then the response is OK; if it fails for some reason, an error code is reported. If the <Action> parameter is 2(read data from NVM), data specified by <DataType> parameter is shown in the following format: **#SSLSECDATA: <connId>,<DataType>** **<DATA>** **OK** If <DataType> data has not been stored (or it has been delete) the response has the following format: **#SSLSECDATA: <connId>,<DataType>** **No data sotred** **OK** Note: Private keys with password ARE NOT supported. Note: <size> parameter is mandatory if the <write> action is issued, but it has

#SSLSECDATA – Manage the security data	
	to be omitted for <delete> or <read> actions are issued. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: If socket is connected an error code is reported.
AT#SSLSECDATA?	Read command reports what security data are stored in the format: **#SSLSECDATA: <SSId1>,<CertIsSet>,<CAcertIsSet>,<PrivKeyIsSet>** <CertIsSet>, <CAcertIsSet>, <PrivKeyIsSet> are 1 if related data are stored into NVM otherwise 0.
AT#SSLSECDATA=?	Test command returns the range of supported values for all the parameters: **#SSLSECDATA: (1),(0-2),(0-2),(1-2047)**

5.6.3.9.   Sending data through a SSL socket - #SSLSEND

#SSLSEND – Send data to SSL Socket	
AT#SSLSEND=<SSId>[,<Timeout>]	This command allows sending data throught a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 – Until now SSL block manage only one socket. **<Timeout>** - socket send timeout, in 100 ms units 10..5000 – hundreds of ms(factory default is 100) The device responds to the command with the prompt '>' and waits for the data to send. To complete the operation send CTRL-Z char(0x1A hex); to exit without writing the message send ESC char(0x1B hex). If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: the maximum number of bytes to send is 1500; trying to send more data will cause the surplus to be discarded and lost. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used. Note: Before sending data through the SSL connection it has to be established using **AT#SSLD**.

#SSLSEND – Send data to SSL Socket	
	Note: all special characters are not sent like a general byte. (For instance: 0x08 is not sent and behave like a BS, i.e. previous character is deleted)
AT#SSLSEND=?	Test command returns the range of supported values for all the parameters: **#SSLSEND: (1),(10-5000)**

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

#SSLSENDEXT – Send data through a secure socket in Command Mode extended	
AT#SSLSENDEXT= <SSId>,<bytestosend >[,<Timeout>]	This command allows sending data through a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. **<bytestosend>** - number of bytes to be sent Please refer to test command for range **<Timeout>** - time-out in 100 ms units 10..5000 - hundreds of ms (factory default is 100) The device responds to the command with the prompt '>' <greater_than><space> and waits for the data to send. When <bytestosend> bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: if secure socket is not enabled using AT#SSLEN only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set by AT#SSLCFG, is used. Note: Before sending data through the SSL connection it has to be established using AT#SSLD. Note: all special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and don't behave like a BS, i.e. previous character is not deleted)
AT#SSLSENDEXT=?	Test command returns the range of supported values for parameters <SSId> , <bytestosend> and <Timeout>. **#SSLSENDEXT: (1),(1-1500),(10-5000)**

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

#SSLSECCFG – Configure security parameters of a SSL socket	
AT#SSLSECCFG= <SSId>, <CipherSuite>, <auth_mode> [,<cert_format>]	This command allows configuring SSL connection parameters. Parameters: <SSId> - Secure Socket Identifier 1 - Until now SSL block manage only one socket <CipherSuite> 0 - Chiper Suite is chosen by remote Server [default] 1 - TLS_RSA_WITH_RC4_128_MD5 2 - TLS_RSA_WITH_RC4_128_SHA 3 - TLS_RSA_WITH_AES_128_CBC_SHA 4 - TLS_RSA_WITH_NULL_SHA (Not supported, Dummy) <auth_mode> 0 – SSL Verify None[default] 1 – Manage server authentication 2 – Server/Client authentication: CA Certificate(server), Certificate(client) and Private Key(client) are needed(Not supported,Dummy) <cert_format> is an optional parameter. It selects the format of the certificate to be stored via #SSLSECDATA command 0 - DER format 1 - PEM format[default] Note - it is supposed that the module is just powered on and the AT#SSLSECCFG command is entered without <cert_format> parameter, the default format is PEM. In this case the AT#SSLSECCFG? read command doesn't return the setting of the format in order to meet retro compatibility with other families. Now, let's assume that AT#SSLSECCFG command is entered again, but using the <cert_format> parameter for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the <cert_format> is omitted, the AT#SSLSECCFG? read command reports the parameter value entered the last time. Note: Server CA certificate has to be stored through AT#SSLSECDATA. Note: if secure socket is not enabled using #SSLEN only test requests can be made. Read command can be issued if at least a <SSId> is enabled. Note: these values are automatically saved in NVM.
AT#SSLSECCFG?	Read command reports the currently selected parameters in the format: #SSLSECCFG: <SSId1>,<CipherSuite>,<auth_mode>[,<cert_format>]
AT#SSLSECCFG=?	Test command returns the range of supported values for all the parameters.

5.6.4.   FTP AT Commands

5.6.4.1.   FTP Time-Out - #FTPTO

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

5.6.4.2.   FTP Open - #FTPOPEN

#FTPOPEN - FTP Open	

AT#FTPOPEN=
[<server:port>,
<username>,
<password>
[,<mode>]]
	Execution command opens an FTP connection toward the FTP server.
	
	Parameters:
	<server:port> - string type, address and port of FTP server (factory default port 21).
	<username> - string type, authentication user identification string for FTP.
	<password> - string type, authentication password for FTP.
	<mode>
	   0 - active mode (factory default)
	   1 - passive mode
	
	Note : In FTP Open case, the solution dependency limits the maximum time out to 1200 (120 seconds). The FTPTO value that exceed 1200 is considered as 1200.
	
	Note: Before opening FTP connection the GPRS must been activated with **AT#GPRS=1** or **AT# SGACT**

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

5.6.4.3.   FTP Close - #FTPCLOSE

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

5.6.4.4.   FTP Config - #FTPCFG

#FTPCFG – FTP Config	
AT#FTPCFG=	<tout> - time-out in 100 ms units

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

5.6.4.5.　　FTP Put - #FTPPUT

#FTPPUT - FTP Put	
AT#FTPPUT= [[<filename>] [,<connMode>]]	Execution command, issued during an FTP connection, opens a data connection and starts sending **<filename>** file to the FTP server. If the data connection succeeds, a **CONNECT** indication is sent, otherwise a **NO CARRIER** indication is sent. Note: if we set **<connMode>** to 1, the data connection is opened and we remain in command mode and we see the result code **OK** (instead of **CONNECT**) Parameter: **<filename>** - string type, name of the file (maximum length 200 characters) **<connMode>** 0 – online mode 1 – command mode Note: use the escape sequence +++ to close the data connection. Note: The command causes an **ERROR** result code to be returned if no FTP

#FTPPUT - FTP Put	
	connection has been opened yet.

AT#FTPPUT=?	Test command reports the maximum length of <**filename**> and the supported range of values of <**connMode**>. The format is:
	
	#FTPPUT:<length>,(list of supported <connMode>s)
	  where:
	   <length> - integer type value indicating the maximum length of <**filename**>

5.6.4.6.   FTP Get - #FTPGET

#FTPGET - FTP Get	
AT#FTPGET= [<filename>]	Execution command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server. If the data connection succeeds a **CONNECT** indication is sent, otherwise a **NO CARRIER** indication is sent. The file is received on the serial port. Parameter: **<filename>** - file name, string type. Note: The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet. Note: Command closure should always be handled by application. In order to avoid download stall situations a timeout should be implemented by the application.
AT#FTPGET=?	Test command returns the **OK** result code.

5.6.4.7.   FTP GET in command mode - #FTPGETPKT

#FTPGETPKT - FTP Get in command mode	

AT#FTPGETPKT= <filename> [,<viewMode>]	Execution command issued during an FTP connection, opens a data connection and starts getting a file from the FTP server while remaining in **command mode**.
	
	The data port is opened and we remain in **command mode** and we see the result code **OK**.
	Retrieval from FTP server of "remotefile" is started, but data are only buffered in the module.
	It's possible to read data afterwards issuing **#FTPRECV** command.
	
	Parameter:
	<filename> - file name, string type. (maximum length: 200 characters).
	<viewMode> - permit to choose view mode (text format or Hexadecimal)
	  0 – text format (default)
	  1 – hexadecimal format
	
	Note: The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet.

#FTPGETPKT - FTP Get in command mode	
	Note: Command closure should always be handled by application. In order to avoid download stall situations a timeout should be implemented by the application.

AT#FTPGETPKT?	Read command reports current download state for <filename> with <viewMode> chosen, in the format:
	
	#FTPGETPKT: <**remotefile**>,<**viewMode**>,<**eof**>
	<**eof**>
	  0 – file currently being transferred
	  1 – complete file has been transferred to FTP client

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

5.6.4.8.   FTP Type - #FTPTYPE

#FTPTYPE - FTP Type	

AT#FTPTYPE= [<type>]	Set command, issued during an FTP connection, sets the file transfer type.
	
	Parameter:
	<type> - file transfer type:
	  0 - binary
	  1 - ascii
	
	Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

AT#FTPTYPE?	Read command returns the current file transfer type, in the format: **#FTPTYPE: <type>**
AT#FTPTYPE=?	Test command returns the range of available values for parameter **<type>**: **#FTPTYPE: (0,1)**

5.6.4.9.   FTP Read Message - #FTPMSG

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

5.6.4.10.   FTP Delete - #FTPDELE

#FTPDELE - FTP Delete	
AT#FTPDELE= [<filename>]	Execution command, issued during an FTP connection, deletes a file from the remote working directory. Parameter: **<filename>** - string type, it's the name of the file to delete. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

#FTPDELE - FTP Delete	
AT#FTPDELE=?	Test command returns the **OK** result code.

5.6.4.11.   FTP Print Working Directory - #FTPPWD

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

5.6.4.12.   FTP Change Working Directory - #FTPCWD

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

5.6.4.13.   FTP List - #FTPLIST

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

5.6.4.14.   Get file size - #FTPFSIZE

#FTPFSIZE – Get file size from FTP server	
AT#FTPFSIZE= <filename>	Execution command, issued during an FTP connection, permits to get file size of <**filename**> file.

#FTPFSIZE – Get file size from FTP server	
	Note: **#FTPTYPE=0** command has to be issued before **#FTPFSIZE** command, to set file transfer type to binary mode.
AT#FTPFSIZE=?	Test command returns the **OK** result code.

5.6.4.15.   FTP Append - #FTPAPP

#FTPAPP – FTP Append	

AT#FTPAPP= [<**filename**> [,<**connMode**>]]	Execution command, issued during an FTP connection, opens a data connection and append data to existing <**filename**> file.
	
	If the data connection succedds, a **CONNECT** indication is sent,
	Afterward a **NO CARRIER** indication is sent when the socket is closed.
	
	Note: if we set <**connMode**> to 1, the data connection is opened and we remain in **command mode** and we see the result code **OK** (instead of **CONNECT**)
	
	Parameters:
	<filename> – string type, name of the file.
	<**connMode**>
	  0 – online mode
	  1 – command mode
	
	Note: use the escape sequence +++ to close the data connection
	
	Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

AT#FTPAPP=?	Test command reports the maximum length of <**filename**> and the supported range of values of <**connMode**>. The format is: **#FTPAPP:<length>,(list of supported <connMode>s)** where: <**length**> – integer type value indicating the maximum length of <**filename**>

5.6.4.16.   Set restart position - #FTPREST

#FTPREST – Set restart position for FTP GET	
AT#FTPREST= <**restartposition**>	Set command sets the restart position for successive **#FTPGET** (or **#FTPGETPKT**) command. It permits to restart a previously interrupted FTP download from the selected position in byte. Parameters: <**restartposition**> – position in byte of restarting for successive **#FTPGET** (or **#FTPGETPKT**) Note: It's necessary to issue **#FTPTYPE=0** before successive **#FTPGET** (or

#FTPREST – Set restart position for FTP GET	
	#FTPGETPKT) to set binary file transfer type. Note: Setting <**restartposition**> has effect on successive FTP download. After successive successfully initiated **#FTPGET** (or **#FTPGETPKT**) command, <**restartposition**> is automatically reset. Note: value set for <**restartposition**> has effect on next data transfer (data port opened by **#FTPGET** or **#FTPGETPKT**). Then <**restartposition**> value is automatically assigned to 0 for next download.
AT#FTPREST?	Read command returns the current <restartposition> **#FTPREST:<restartposition>**
AT#FTPREST=?	Test command returns the OK result code.

5.6.4.17.   Receive Data In Command Mode - #FTPRECV

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

#FTPRECV – Receive Data In Command Mode
AT#FTPRECV=400 #FTPRECV:400 Text row number 1 * 11111111111111111111111111 * Text row number 2 * 22222222222222222222222222 * Text row number 3 * 33333333333333333333333333 * Text row number 4 * 44444444444444444444444444 * Text row number 5 * 55555555555555555555555555 * Text row number 6 * 66666666666666666666666666 * Text row number 7 * 77777777777777777777777777 * Text row number 8 * 888888888888888888888 OK AT#FTPRECV=200 #FTPRECV:200 88888 * Text row number 9 * 99999999999999999999999999 * Text row number 10 * AAAAAAAAAAAAAAAAAAAAAAAAAA* Text row number 11 * BBBBBBBBBBBBBBBBBBBBBBBBBB * Text row number 12 * CCCCCCCCCCCCCCCC OK *Note: to check when you have received complete file it's possible to use* **AT#FTPGETPKT** *read command:* AT#FTPGETPKT? #FTPGETPKT:sample.txt,0,1 OK *(you will get <eof> set to 1)*

5.6.4.18.   FTP Append Extended - #FTPAPPEXT

#FTPAPPEXT - FTP Append Extended	
AT#FTPAPPEXT= <bytestosend>[,<eof>]	This command permits to send data on a FTP data port while the module is in command mode. FTP data port has to be previously opened through **#FTPPUT** (or **#FTPAPP**) with <connMode> parameter set to **command mode** connection. Parameters: <bytestosend> - number of bytes to be sent 1..1500 <eof> - data port closure

#FTPAPPEXT - FTP Append Extended	
	0 – normal sending of data chunk 1 – close data port after sending data chunk The device responds to the command with the prompt <**greater_than**><**space**> and waits for the data to send. When <**bytestosend**> bytes have been sent, operation is automatically completed. If (all or part of the) data are successfully sent, then the response is: #FTPAPPEXT:<sentbytes> OK Where <**sentbytes**> are the number of sent bytes. Note: <**sentbytes**> could be less than <**bytestosend**> If data sending fails for some reason, an error code is reported.
AT#FTPAPPEXT=?	Test command reports the supported range of values for parameters <**bytestosend**> and <**eof**>
Example	AT#FTPOPEN="IP",username,password OK AT#FTPPUT=<filename>,1 *(the new param 1 means that we open the connection in command mode)* OK *Here data socket will stay opened, but interface will be available (command mode)* AT#FTPAPPEXT=Size >… *write here the binary data. As soon Size byte are written, data are sent and OK is returned* #FTPAPPEXT:<SentBytes> OK …….. *Last #FTPAPPEXT will close the data socket, because second (optional) parameter has this meaning:* AT#FTPAPPEXT=Size,1 >… *write here the binary data. As soon Size byte are written, data are sent and OK is returned* #FTPAPPEXT:<SentBytes> OK *If the user has to reopen the data port to send another (or append to the same) file, he can restart with the FTPPUT (or FTPAPP).* *Then FTPAPPEXT, … to send the data chunks on the reopened data port.*

#FTPAPPEXT - FTP Append Extended	
	Note: if while sending the chunks the data port is closed from remote, user will be aware of it because #FTPAPPEXT will indicatd ERROR and cause (available if previously issued the command AT+CMEE=2) will indicate that socket has been closed. *Also in this case obviously, data port will have to be reopened with FTPPUT and so on...(same sequence)*

5.6.5.   Enhanced Easy GPRS® Extension AT Commands

5.6.5.1.   Authentication User ID - #USERID

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

5.6.5.2.   Authentication Password - #PASSW

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

5.6.5.3. Packet Size - #PKTSZ

#PKTSZ - Packet Size	

AT#PKTSZ= [<size>]	Set command sets the default packet size to be used by the TCP/UDP/IP stack for data sending.
	
	Parameter:
	<size> - packet size in bytes
	  0 - automatically chosen by the device
	  1..1500 - packet size in bytes (factory default is 300)

AT#PKTSZ?	Read command reports the current packet size value. Note: after issuing command **AT#PKTSZ=0**, the Read command reports the value automatically chosen by the device.
AT#PKTSZ=?	Test command returns the allowed values for the parameter **<size>**.
Example	AT#PKTSZ=100 OK AT#PKTSZ? #PKTSZ: 100 OK AT#PKTSZ=0 OK AT#PKTSZ? #PKTSZ: 300 OK ->*value automatically chosen by device*

5.6.5.4. Data Sending Time-Out - #DSTO

#DSTO -Data Sending Time-Out	

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

AT#DSTO?	Read command reports the current data sending time-out value.
AT#DSTO=?	Test command returns the allowed values for the parameter **<tout>**.
Example	AT#DSTO=10 ->*1 sec. time-out*

#DSTO -Data Sending Time-Out	
	OK AT#DSTO? #DSTO: 10 OK

5.6.5.5. Socket Inactivity Time-Out - #SKTTO

#SKTTO - Socket Inactivity Time-Out	

AT#SKTTO=
[<tout>]
	Set command sets the maximum time with no data exchanging on the socket that the module awaits before closing the socket and deactivating the GPRS context.
	
	Parameter:
	<tout> - socket inactivity time-out in seconds units
	  0 - no time-out.
	  1..65535 - time-out in sec. units (factory default is 90).
	
	Note: this time-out applies when no data is exchanged in the socket for a long time and therefore the socket connection has to be automatically closed and the GPRS context deactivated.

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

5.6.5.6. Socket Definition - #SKTSET

#SKTSET - Socket Definition	

AT#SKTSET=
[<socket type>,
<remote port>,
<remote addr>,
[<closure type>],
[<local port>]]
	Set command sets the socket parameters values.
	Parameters:
	<socket type> - socket protocol type
	  0 - TCP (factory default)
	  1 - UDP
	<remote port> - remote host port to be opened
	  1..65535 - port number (factory default is 3333)
	<remote addr> - address of the remote host, string type. This parameter can be either:
	  - any valid IP address in the format: xxx.xxx.xxx.xxx
	  - any host name to be solved with a DNS query in the format: <host name> (factory default is the empty string "")
	<closure type> - socket closure behaviour for TCP
	  0 - local host closes immediately when remote host has closed (default)
	  255 - local host closes after an escape sequence (+++)

#SKTSET - Socket Definition	

	<local port> - local host port to be used on UDP socket
	  1..65535 - port number (factory default is 0)
	
	Note: **<closure type>** parameter is valid only for TCP socket type, for UDP sockets shall be left unused.
	
	Note: **<local port>** parameter is valid only for UDP socket type, for TCP sockets shall be left unused.
	
	Note: The resolution of the host name is done when opening the socket, therefore if an invalid host name is given to the **#SKTSET** command, then an error message will be issued.
	
	Note: the DNS Query to be successful requests that:
	  - the GPRS context 1 is correctly set with +**CGDCONT**
	  - the authentication parameters are set (**#USERID**, **#PASSW**)
	  - the GPRS coverage is enough to permit a connection.

AT#SKTSET?	Read command reports the socket parameters values, in the format: **AT#SKTSET: <socket type>,<remote port>,<remote addr>,<closure type>,<local port>**
AT#SKTSET=?	Test command returns the allowed values for the parameters.
Example	AT#SKTSET=0,1024,"www.telit.net" OK
Note	Issuing command #QDNS will overwrite <remote addr> setting.

5.6.5.7.   Query DNS - #QDNS

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

5.6.5.8.   DNS Response Caching - #CACHEDNS

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

5.6.5.9.   Manual DNS Selection - #DNS

#DNS – Manual DNS Selection	
AT#DNS=<cid>, <primary>, <secondary>	Set command allows to manually set primary and secondary DNS servers for a PDP context defined by +**CGDCONT** Parameters: **<cid>** - context identifier 1..5 - numeric parameter which specifies a particular PDP context definition. (see +CGDCONT command) **<primary>** - **manual primary DNS server**, string type, in the format "**xxx.xxx.xxx.xxx**" used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0") **<secondary>** - **manual secondary DNS server**, string type, in the format "**xxx.xxx.xxx.xxx**" used for the specified cid; we're using this value instead of the **secondary DNS server** come from the network (default is "0.0.0.0"). Note: if **<primary> is "0.0.0.0.0"** and **<secondary> is not "0.0.0.0"**, then issuing **AT#DNS=…** raises an error.

#DNS – Manual DNS Selection	
	Note: if **\<primary\> is "0.0.0.0"** we're using the **primary DNS server** come from the network as consequence of a context activation. Note: if **\<primary\> is not "0.0.0.0"** and **\<secondary\> is "0.0.0.0"**, then we're using only the **manual primary DNS server.** Note: the context identified by **\<cid\>** has to be previously defined, elsewhere issuing **AT#DNS=…** raises an error. Note: the context identified by **\<cid\>** has to be not activated yet, elsewhere issuing **AT#DNS=…** raises an error.
AT#DNS?	Read command returns the manual DNS servers set either for every defined PDP context and for the single GSM context (only if defined), in the format: **[#DNS: \<cid\>,\<primary\>,\<secondary\>[\<CR\>\<LF\>** **#DNS: \<cid\>,\<primary\>,\<secondary\>]]**
AT#DNS=?	Test command reports the supported range of values for the **\<cid\>** parameter.only, in the format: **#DNS: (1,5),,**

5.6.5.10.   Socket TCP Connection Time-Out - #SKTCT

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

5.6.5.11. Socket Parameters Save - #SKTSAV

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

5.6.5.12.   Socket Parameters Reset - #SKTRST

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

5.6.5.13.   GPRS Context Activation - #GPRS

#GPRS - GPRS Context Activation	

AT#GPRS=
[<mode>]
	Execution command deactivates/activates the **PDP context #1**, eventually proceeding with the authentication with the parameters given with **#PASSW** and **#USERID.**
	
	Parameter:
	<mode> - **PDP context** activation mode
	  0 - **PDP context #1** deactivation request
	  1 - **PDP context #1** activation request
	
	In the case that the **PDP context #1** has been activated, the result code **OK** is preceded by the intermediate result code:
	
	+IP: <ip_address_obtained>
	
	reporting the local IP address obtained from the network.
	
	Note: at least a **socket identifier** needs to be associated with **PDP context #1** in order to every **#GPRS** action be effective; by default the **PDP context #1** is associated with socket **identifiers 1, 2** and **3**, but it is possible to modify these associations through **#SCFG**. Trying to issue a **#GPRS** action when **no socket identifier** is associated **with PDP context #1** raises an error.
	
	Note: if the **PDP context #1** has been activated issuing **AT#GPRS=1**, then
	• if you request to deactivate the **PDP context #1** during a call issuing

#GPRS - GPRS Context Activation	
	AT#GPRS=0 and then, after the call termination, you want to activate the **PDP context #1** again through **#GPRS**, you need to issue the following sequence of three commands **AT#GPRS=1** **OK** **AT#GPRS=0** **OK** **AT#GPRS=1** **OK**

AT#GPRS?	Read command reports the current status of the **PDP context #1**, in the format:
	
	#GPRS: <status>
	
	where:
	<status>
	  0 - **PDP context #1** deactivated
	  1 - **PDP context #1** activated
	  2 - **PDP context #1** activation pending.

AT#GPRS=?	Test command returns the allowed values for parameter **<mode>**.
Example	AT#GPRS=1 +IP: 129.137.1.1 OK *Now **PDP Context #1** has been activated and our IP is 129.137.1.1* AT#GPRS=0 OK *Now **PDP context #1** has been deactivated, IP is lost.*

5.6.5.14.   Socket Dial - #SKTD

#SKTD - Socket Dial	

AT#SKTD=
[<socket type>,
<remote port>,
<remote addr>,
[<closure type>],
[<local port>]]
	Set command opens the socket towards the peer specified in the parameters.
	
	Parameters:
	<socket type> - socket protocol type
	  0 - TCP (factory default)
	  1 - UDP
	<remote port> - remote host port to be opened
	  1..65535 - port number (factory default is 0)
	<remote addr> - address of the remote host, string type. This parameter can be either:
	    - any valid IP address in the format: xxx.xxx.xxx.xxx
	    - any host name to be solved with a DNS query in the format: **<host name>** (factory default is the empty string "")
	<closure type> - socket closure behaviour for TCP
	  0 - local host closes immediately when remote host has closed (default)

#SKTD - Socket Dial	

	255 - local host closes after an escape sequence (+++)
	<local port> - local host port to be used on UDP socket
	  1..65535 - port number (factory default is 0)
	
	Note: **<closure type>** parameter is valid only for TCP socket type, for UDP sockets shall be left unused.
	
	Note: **<local port>** parameter is valid only for UDP socket type, for TCP sockets shall be left unused.
	
	Note: the resolution of the host name is done when opening the socket, therefore if an invalid host name is given to the **#SKTD** command, then an error message will be issued.
	
	Note: the command to be successful requests that:
	  - the GPRS context 1 is correctly set with +CGDCONT
	  - the authentication parameters are set (#USERID, #PASSW) the GPRS coverage is enough to permit a connection
	  - the GPRS has been activated with **AT#GPRS=1**
	
	Note: If all parameters are omitted then the behaviour of Set command is the same as Read command.

AT#SKTD?	Read command reports the socket dial parameters values, in the format: **AT#SKTD: <socket type>,<remote port>,<remote addr>, <closure type>,<local port>**
AT#SKTD=?	Test command returns the allowed values for the parameters.
Example	AT#SKTD=0,1024,"123.255.020.001",255 CONNECT AT#SKTD=1,1024,"123.255.020.001", ,1025 CONNECT *In this way my local port 1025 is opened to the remote port 1024* AT#SKTD=0,1024,"www.telit.net", 255 CONNECT

5.6.5.15. Socket Listen - #SKTL

#SKTL - Socket Listen	

**AT#SKTL
=[<mode>,
<socket type>,
<input port>,
[<closure type>]]**
	Execution command opens/closes the socket listening for connection requests.
	
	Parameters:
	<mode> - socket mode
	  0 - closes socket listening
	  1 - starts socket listening
	<socket type> - socket protocol type
	  0 – TCP (default)

#SKTL - Socket Listen	

	1 - UDP
	\<input port> - local host input port to be listened
	  1..65535 - port number
	\<closure type> - socket closure behaviour for TCP
	  0 - local host closes immediately when remote host has closed (default)
	  255 - local host closes after an escape sequence (+++)
	
	Command returns the **OK** result code if successful.
	
	Note: the command to be successful requests that:
	- the GPRS context 1 is correctly set with +CGDCONT
	- the authentication parameters are set (#USERID, #PASSW)
	- the GPRS coverage is enough to permit a connection
	- the GPRS has been activated with **AT#GPRS=1**
	
	When a connection request comes on the input port, if the sender is not filtered by the internal firewall (see command #FRWL), an unsolicited code is reported:
	
	   +CONN FROM: \<remote addr>
	
	   Where:
	   \<remote addr> - host address of the remote machine that contacted the device.
	
	When the connection is established the **CONNECT** indication is given and the modem goes into data transfer mode.
	
	On connection close or when context is closed with **#GPRS=0** the socket is closed and no listen is anymore active.
	
	If the context is closed by the network while in listening, the socket is closed, no listen is anymore active and an unsolicited code is reported:
	
	   #SKTL: ABORTED
	
	Note: when closing the listening socket \<input port> is a don't care parameter

AT#SKTL?	Read command returns the current socket listening **status** and the last settings of parameters **\<socket type>**,**\<input port>** and **\<closure type>**, in the format:
	
	#SKTL: \<status>,\<socket type>,\<input port>,\<closure type>
	Where
	\<status> - socket listening status
	  0 - socket not listening
	  1 - socket listening

AT#SKTL=?	Test command returns the allowed values for parameters **\<mode>**, **\<socket type>**, **\<input port>** and **\<closure type>**.

#SKTL - Socket Listen	
Example	*Activate GPRS* AT#GPRS=1 +IP: ###.###.###.### OK *Start listening* AT#SKTL=1,0,1024 OK or AT#SKTL=1,0,1024,255 OK *Receive connection requests* +CONN FROM: 192.164.2.1 CONNECT *exchange data with the remote host* *send escape sequence* +++ NO CARRIER *Now listen is not anymore active* *to stop listening* AT#SKTL=0,0,1024, 255 OK
Note	The main difference between this command and **#SKTD** is that **#SKTL** does not contact any peer, nor does any interaction with the GPRS context status, leaving it **ON** or **OFF** according to the **#GPRS** setting, therefore when the connection made with **#SKTL** is closed the context (and hence the local IP address) is maintained.

5.6.5.16.   Socket Listen Ring Indicator - #E2SLRI

#E2SLRI - Socket Listen Ring Indicator	

AT#E2SLRI=[<n>]	Set command enables/disables the Ring Indicator pin response to a Socket Listen connect and, if enabled, the duration of the negative going pulse generated on receipt of connect.
	
	Parameter:
	<n> - **RI** enabling
	  0 - **RI** disabled for Socket Listen connect (factory default)
	  50..1150 - **RI** enabled for Socket Listen connect; a negative going pulse is generated on receipt of connect and **<n>** is the duration in ms of this pulse.

AT#E2SLRI?	Read command reports whether the Ring Indicator pin response to a Socket Listen connect is currently enabled or not, in the format: **#E2SLRI: <n>**
AT#E2SLRI=?	Test command returns the allowed values for parameter **<status>.**

5.6.5.17.   Firewall Setup - #FRWL

#FRWL - Firewall Setup	
AT#FRWL= [<action>, <ip_address>, <net mask>]	Execution command controls the internal firewall settings. Parameters: <action> - command action 0 - remove selected chain 1 - add an **ACCEPT** chain 2 - remove all chains (**DROP** everything); <ip_addr> and <net_mask> has no meaning in this case. <ip_addr> - remote address to be added into the **ACCEPT** chain; string type, it can be any valid IP address in the format: xxx.xxx.xxx.xxx <net_mask> - mask to be applied on the <ip_addr>; string type, it can be any valid IP address mask in the format: xxx.xxx.xxx.xxx Command returns **OK** result code if successful. Note: the firewall applies for incoming (listening) connections only. Firewall general policy is **DROP**, therefore all packets that are not included into an **ACCEPT** chain rule will be silently discarded. When a packet comes from the IP address **incoming_IP**, the firewall chain rules will be scanned for matching with the following criteria: **incoming_IP & <net_mask> = <ip_addr> & <net_mask>** If criteria is matched, then the packet is accepted and the rule scan is finished; if criteria is not matched for any chain the packet is silently dropped.
AT#FRWL?	Read command reports the list of all **ACCEPT** chain rules registered in the Firewall settings in the format: **#FRWL: <ip_addr>,<net_mask>** **#FRWL: <ip_addr>,<net_mask>** **….** **OK**
AT#FRWL=?	Test command returns the allowed values for parameter **<action>.**
Example	*Let assume we want to accept connections only from our devices which are on the IP addresses ranging from 197.158.1.1 to 197.158.255.255* *We need to add the following chain to the firewall:* AT#FRWL=1,"197.158.1.1","255.255.0.0" OK
Note	For outgoing connections made with #SKTD the remote host is dynamically inserted into the **ACCEPT** chain for all the connection duration. Therefore the **#FRWL** command shall be used only for defining the **#SKTL** behaviour, deciding which hosts are allowed to connect to the local device.

#FRWL - Firewall Setup	
	Rules are not saved in NVM, at startup the rules list will be empty.

5.6.5.18.   GPRS Data Volume - #GDATAVOL

#GDATAVOL - GPRS Data Volume	

AT#GDATAVOL= [<mode>]	Execution command reports, for every active PDP context, the amount of data the last GPRS session received and transmitted, or it will report the total amount of data received and transmitted during all past GPRS sessions, since last reset.
	
	Parameter:
	<mode>
	 0 - it resets the GPRS data counter for the all the available PDP contexts (1-16)
	 1 - it reports the last GPRS session data counter for the all the set PDP contexts (i.e. all the PDP contexts with APN parameter set using +CGDCONT), in the format:
	
	   #GDATAVOL: <cid*n*>,<tot*n*>,<sent*n*>,<received*n*>[<CR><LF>
	   #GDATAVOL: <cid*m*>,<tot*m*>,<sent*m*>,<received*m*>[…]]
	
	   where:
	   <cid*n*> - PDP context identifier
	     1..5 - numeric parameter which specifies a particular PDP context definition.
	    (see +CGDCONT command)
	   <tot*n*> - number of bytes either received or transmitted in the last GPRS session for **<cid*n*>** PDP context;
	   <sent*n*> - number of bytes transmitted in the last GPRS session for **<cid*n*>** PDP context;
	   <received*n*> - number of bytes received in the last GPRS session for **<cid*n*>** PDP context;
	 2 - it reports the total GPRS data counter, since last reset, for the all the set PDP contexts (i.e. all the PDP context with APN parameter set using **+CGDCONT**), in the format:
	
	   #GDATAVOL: <cid*n*>,<tot*n*>,<sent*n*>,<received*n*>[<CR><LF>
	   #GDATAVOL: <cid*m*>,<tot*m*>,<sent*m*>,<received*m*>[…]]
	
	   where:
	   <cid*n*> - PDP context identifier
	     1..5 - numeric parameter which specifies a particular PDP context definition.
	    (see +CGDCONT command)
	   <tot*n*> - number of bytes either received or transmitted, in every GPRS session since last reset, for **<cid*n*>** PDP context;
	   <sent*n*> - number of bytes transmitted, in every GPRS session since last reset, for **<cid*n*>** PDP context;
	   <received*n*> - number of bytes received, in every GPRS session since last reset, for **<cid*n*>** PDP context;

#GDATAVOL - GPRS Data Volume	
	Note: last GPRS session counters are not saved in NVM so they are loosen at power off. Note: total GPRS session counters are saved on NVM.
AT#GDATAVOL=?	Test command returns the range of supported values for parameter **<mode>.**

5.6.5.19.   ICMP Ping Support - #ICMP

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

5.6.5.20.   Ping Request - #PING

#PING – Ping Request	

AT#PING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>]]]]	Set command sends a Ping Echo Request messages and to receive the corresponding Echo Reply.
	
	Parameter:
	 <IPaddr> - Address of the remote host. This parameter can be either:
	        - any valid IP address in the format:
	          "xxx.xxx.xxx.xxx"
	        - any host name to be solved with a DNS query
	
	<retryNum> - Number of Ping Echo Request to be sent:
	1-64 (default 4)
	
	<len> - Length of Ping Echo Request message
	32-1460 (default 32)
	
	<timeout> - The timeout, in 100 ms units, waiting a single Echo Reply:
	1-600 (default 50)
	
	<ttl> - Time to live:
	1-255 (default 128)

#PING – Ping Request	
	Once the single Echo Reply is received a string like that this is displayed: **#PING:<replyId>,<IpAddress>,<replyTime><ttl>** **<replyId>** - Echo Reply number **<IpAddress>** - IP address of the remote host **<replyTime>** - Time, in 100ms units, required to receive the response **<ttl>** - Time to live of the Echo Reply message. Note1: when the Echo Request timeout expires (no reply received on time) the response will contain **<replyTime>** set to 600 and **<ttl>** set to 255 Note2: To receive the corresponding Echo Reply is not required to enable separately AT#ICMP Note3: Before send PING Request the GPRS context must have been activated by AT#SGACT=1,1
AT#PING=?	Test command reports the supported range of values for the **#PING** command parameters
Example	AT#PING=www.telit.com #PING: 01,"81.201.117.177",6,50 #PING: 02,"81.201.117.177",5,50 #PING: 03,"81.201.117.177",6,50 #PING: 04,"81.201.117.177",5,50 OK

5.6.5.21.   DNS from Network - #NWDNS

#NWDNS – DNS from Network	
AT#NWDNS= **[<cid>[,<cid>** **[,…]]]**	Execution command returns a list of primary and secondary DNS addresses for the specified PDP context identifiers Parameters: **<cid>** - Context identifier 1..5 - numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). Note: if no **<cid>** is specified, the DNS addresses for all **defined** contexts are returned. Note: issuing the command with more than 6 parameters raises an error.

#NWDNS – DNS from Network	
	Note: the command returns only one row of information for every specified **<cid>**, even if the same **<cid>** is present more than once. The command returns a row of information for every specified **<cid>** whose context has been already defined. No row is returned for a **<cid>** whose context has not been defined yet. Response format is: **#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress>[<CR><LF>** **#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress> […]]** where: **<cid>** - context identifier, as before **<PDNSaddress>,<SDNSaddress>** - primary and secondary DNS addresses set through AT#DNS command. If not set, they are the primary and secondary DNS addresses assigned during the PDP context activation.
AT#NWDNS=?	Test command returns a list of defined **<cid>**s.

5.6.6.   SMS AT Commands

5.6.6.1.   Move Short Message To Other Memory - #SMSMOVE

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

#SMSMOVE – Move Short Message To Other Memory	
AT#SMSMOVE=?	Test command reports the supported values for parameter **<index>**
Example	*AT+CPMS="ME"* *+CPMS: 3,100,0,20,0,20* *OK* *AT#SMSMOVE?* *#SMSMOVE: "ME",3,100,"SM",0,50* *OK* *//the current memory is ME where 3 SMs are stored; the destination memory is SIM that is empty* *AT+CMGL=ALL* *+CMGL: 1,"STO UNSENT","32XXXXXXX","",* *test 1* *+CMGL: 2,"STO UNSENT","32XXXXXXX","",* *test 2* *+CMGL: 3,"STO UNSENT","32XXXXXXX","",* *test 3* *OK* *//list the SMs to discover the memory index* *AT#SMSMOVE=1* *OK* *//move the SM in the first position of ME to SIM* *AT#SMSMOVE?* *#SMSMOVE: "ME",2,100,"SM",1,50* *OK* *//now we have 2 SMs in ME and 1 in SIM*

5.6.6.2.　　SMS Commands Operation Mode - #SMSMODE

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

5.6.7. E-mail Management AT Commands

5.6.7.1. E-mail SMTP Server - #ESMTP

#ESMTP - E-mail SMTP Server	

AT#ESMTP=
[<smtp>]
	Set command sets the SMTP server address, used for E-mail sending.
	SMTP server can be specified as IP address or as nick name.
	
	Parameter:
	<smtp> - SMTP server address, string type. This parameter can be either:
	   - any valid IP address in the format: xxx.xxx.xxx.xxx
	   - any host name to be solved with a DNS query in the format: **<host name>**
	(factory default is the empty string "")
	
	Note: the max length for **<smtp>** is the output of Test command.

AT#ESMTP?	Read Command reports the current SMTP server address, in the format: **#ESMTP: <smtp>**
AT#ESMTP=?	Test command returns the max length for the parameter **<smtp>.**
Example	AT#ESMTP="smtp.mydomain.com" OK
Note	The SMTP server used shall be inside the APN space (the smtp server provided by the network operator) or it must allow the Relay, otherwise it will refuse to send the e-mail.

5.6.7.2. E-mail Sender Address - #EADDR

#EADDR - E-mail Sender Address	

AT#EADDR=
[<e-add>]
	Set command sets the sender address string to be used for sending the e-mail.
	
	Parameter:
	<e-addr> - sender address, string type.
	  - any string value up to max length reported in the Test command.
	    (factory default is the empty string "")

AT#EADDR?	Read command reports the current sender address, in the format: **#EADDR: <e-addr>**
AT#EADDR=?	Test command returns the maximum allowed length of the string parameter **<e-addr>.**
Example	AT#EADDR="me@email.box.com" OK AT#EADDR? #EADDR: "me@email.box.com" OK

5.6.7.3. E-mail Authentication User Name - #EUSER

#EUSER - E-mail Authentication User Name	

AT#EUSER=
[<e-user>]
	Set command sets the user identification string to be used during the authentication step of the SMTP.
	
	Parameter:
	<e-user> - e-mail authentication User ID, string type.
	  - any string value up to max length reported in the Test command.
	     (factory default is the empty string "")
	
	Note: if no authentication is required then the **<e-user>** parameter shall be empty "".

AT#EUSER?	Read command reports the current user identification string, in the format: **#EUSER: <e-user>**
AT#EUSER=?	Test command returns the maximum allowed length of the string parameter **<e-user>**.
Example	AT#EUSER="myE-Name" OK AT#EUSER? #EUSER: "myE-Name" OK
Note	It is a different user field than the one used for GPRS authentication (see #USERID).

5.6.7.4. E-mail Authentication Password - #EPASSW

#EPASSW - E-mail Authentication Password	

AT#EPASSW=
[<e-pwd>]
	Set command sets the password string to be used during the authentication step of the SMTP.
	
	Parameter:
	<e-pwd> - e-mail authentication password, string type.
	  - any string value up to max length reported in the Test command.
	    (factory default is the empty string "")
	
	Note: if no authentication is required then the **<e-pwd>** parameter shall be empty "".

AT#EPASSW=?	Test command returns the maximum allowed length of the string parameter **<e-pwd>**.
Example	AT#EPASSW="myPassword" OK
Note	It is a different password field than the one used for GPRS authentication (see #PASSW).

5.6.7.5. E-mail Sending - #EMAILD

#EMAILD - E-mail Sending	
AT#EMAILD=[<da>, <subj>]	Execution command sends an e-mail message if GPRS context has already been activated with **AT#SGACT=1,1** or **AT#GPRS=1**. Parameters: **<da>** - destination address, string type. (maximum length 100 characters) **<subj>** - subject of the message, string type. (maximum length 100 characters) The device responds to the command with the prompt '>' and awaits for the message body text. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). If e-mail message is successfully sent, then the response is **OK**. If message sending fails for some reason, an error code is reported Note: Care must be taken to ensure that during the command execution, no other commands are issued. To avoid malfunctions is suggested to wait for the **OK** or **ERROR / +CMS ERROR:<err>** response before issuing further commands. Note: maximum length for message body is 1500 trying to send more data will cause the surplus to be discarded and lost.
AT#EMAILD=?	Test command returns the **OK** result code.

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

5.6.7.6.   E-mail Parameters Save - #ESAV

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

5.6.7.7.   E-mail Parameters Reset - #ERST

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

5.6.7.8.   SMTP Read Message - #EMAILMSG

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

5.6.7.9.   Send Mail with Attachment - #SMTPCL

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

#SMTPCL – Send Mail with Attachment	
	After sending message body text (as with #EMAILD), the command switch to online mode if attachment has to be sent. While in online mode data received on the serial port are transmitted on the SMTP socket as MIME attachment. The escape sequence has to be sent to close the SMTP connection. Encoding of data received on the serial port is performed if required (binary data), before transmission on the SMTP socket. Parameters: <da> - destination address, string type. (maximum length 100 characters) <subj> - subject of the message, string type. (maximum length 100 characters) <att> - attached file flag 0 – no attachment 1 – attach a txt file 2 – attach a binary file(jpg,bin,pdf,...) <filename> - attached file name (maximum length 50 characters) <encod> -Content-Transfer-Encoding used for attachment 0 – "7bit" means data all represented as short lines of US-ASCII data 1 – "base64" designed to represent arbitrary sequences of octets in a form that need not be humanly readable Note: if no attachment (<att> 0) has to be sent, the behavior is the same as with #EMAILD. OK after CTRL-Z is returned(if connection was successful), the switch to online mode is not performed. Note: If a txt file (<att>=1) is attached, only <encod>0("7bit") is possible. If a binary file (<att>=2) is attached, only <encod>1("base64") is possible. Note: if <att>=0 and <filename> is present and not empty, the attachment won't be considered Note: if <att> 1 or 2 and <filename> is not present, command will return an ERROR
AT# SMTPCL =?	Test command reports the supported range of values for parameters <da>,<subj>,<att>[,<filename>,<encod>]
Examples	at#smtpcl="me@myaddress.com","test1",1,"sample.txt",0

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

5.6.8.   HTTP AT Commands

5.6.8.1.   Configure HTTP parameters - #HTTPCFG

#HTTPCFG – configure HTTP parameters	
AT#HTTPCFG=<pr of_id>[,<server_addr ess>[,<server_port>[, <auth_type>[,<usern ame>[,<password>[,< ssl_enabled>[,<timeo ut> [,<cid>]]]]]]]]	This command sets the parameters needed to the HTTP connection Parameters: <**prof_id**> - Numeric parameter indicating the profile identifier. Range: 0-2 <**server_address**> - String parameter indicating the IP address of the HTTP server. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query Default: "" for first and second profile; "m2mlocate.telit.com" for third profile. <**server_port**> - Numeric parameter indicating the TCP remote port of the HTTP server to connect to. Default: 80 for first and second profile; 9978 for third profile. Range 1...65535. <**auth_type**> - Numeric parameter indicating the HTTP authentication type. 0 – no authentication (default) 1 – basic authentication

#HTTPCFG – configure HTTP parameters	

	\<username> - String parameter indicating authentication user identification string for HTTP.
	
	\<password> - String parameter indicating authentication password for HTTP.
	
	\<ssl_enabled> - Numeric parameter indicating if the SSL encryption is enabled.
	  0 – SSL encryption disabled (default)
	  1 – SSL encryption enabled (not yet implemented and not available for setting)
	
	\<timeout>: Numeric parameter indicating the time interval in seconds to wait for receiving data from HTTP server. Range: (1- 65535). Default: 120.
	
	\<cid> - Numeric parameter indicating the PDP Context Identifier. Range: (1-5). Default: 1
	
	Note: a special form of the Set command, **#HTTPCFG=\<prof_id>**, causes the values for profile number **\<prof_id>** to reset to default values.
	
	Note: if the SSL encryption is enabled, the **\<cid>** parameter has to be set to 1.
	
	Note: only one profile can use the SSL encryption.
	
	Note: values are automatically saved in NVM.

AT#HTTPCFG?	Read command returns the current settings for each defined profile in the format: **#HTTPCFG**: **\<prof_id>,\<server_address>,\<server_port>,\<auth_type>,\<username>,\<password>,\<ssl_enabled>,\<timeout>,\<cid>\<CR>\<LF>[\<CR>\<LF>#HTTPCFG:** **\<prof_id>,\<server_address>,\<server_port>,\<auth_type>,\<username>,\<password>,\<ssl_enabled>,\<timeout>,\<cid>]\<CR>\<LF>[…]]**

AT#HTTPCFG =?	Test command returns the supported range of parameters **\<prof_id>, \<server_port>, \<auth_type>, \<ssl_enabled>, \<timeout>** and **\<cid>** and the maximum length of **\<server_address>, \<username>** and **\<password>** parameters in the format:
	
	# HTTPCFG: (list of supported \<prof_id>s),\<s_length>,(list of supported \<server_port>s), (list of supported \<auth_type>s),\<u_length>,\<p_length>,(list of supported \<ssl_enabled>s),(list of supported \<timeout>s),(list of supported \<cid>s)
	
	where:
	\<s_length> - integer type value indicating the maximum length of parameter
	            \<server_address>.
	\<u_length> - integer type value indicating the maximum length of parameter
	            \<username>.

#HTTPCFG – configure HTTP parameters	
	\<p_length\> - integer type value indicating the maximum length of parameter **\<password\>**

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

#HTTPQRY – send HTTP GET, HEAD or DELETE request	
AT#HTTPQRY=\<prof_id\>,\<command\>,\<resource\>[,\<extra_header_line\>]	Execution command performs a GET, HEAD or DELETE request to HTTP server. Parameters: **\<prof_id\>** - Numeric parameter indicating the profile identifier. Range: 0-2 **\<command\>**: Numeric parameter indicating the command requested to HTTP server: 0 – GET 1 – HEAD 2 – DELETE **\<resource\>**: String parameter indicating the HTTP resource (uri), object of the request **\<extra_header_line\>**: String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported. Note: the HTTP request header sent with #HTTPQRY always contains the "Connection: close" line, and it can not be removed. When the HTTP server answer is received, then the following URC is put on the serial port: **#HTTPRING: \<prof_id\>,\<http_status_code\>,\<content_type\>,\<data_size\>** Where: **\<prof_id\>** is defined as above **\<http_status_code\>** is the numeric status code, as received from the server (see RFC 2616) **\<content_type\>** is a string reporting the "Content-Type" header line, as received from the server (see RFC 2616) **\<data_size\>** is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0. Note: if there are no data from server or the server doesn't answer within the time interval specified in **\<timeout\>** parameter of **#HTTPCFG** command, then the URC

#HTTPQRY – send HTTP GET, HEAD or DELETE request	
	#HTTPRING **<http_status_code>** parameter has value 0.
AT#HTTPQRY=?	Test command reports the supported range of values for the parameters **<prof_id>** and **<command>** and the maximum length of **<resource>** parameter in the format: **#HTTPQRY: (list of supported <prof_id>s),(list of supported <command>s),<r_length>,<m_length>** where: **<r_length>** - integer type value indicating the maximum length of parameter **<resource>**. **<m_length>** - integer type value indicating the maximum length of parameter **<extra_header_line>**.

5.6.8.3.   Send HTTP POST or PUT request - #HTTPSND

#HTTPSND – send HTTP POST or PUT request	
AT#HTTPSND=<pro f_id>,<command>,<r esource>,<data_len>[,<post_param>[,<ext ra_header_line>]]	Execution command performs a POST or PUT request to HTTP server and starts sending data to the server. The device shall prompt a three character sequence **<greater_than><greater_than><greater_than>** **(IRA 62, 62, 62)** after command line is terminated with <CR>; after that the data can be entered from TE, sized **<data_len>** bytes. Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<command>**: Numeric parameter indicating the command requested to HTTP server: 0 – POST 1 – PUT **<resource>**: String parameter indicating the HTTP resource (uri), object of the request **<data_len>**: Numeric parameter indicating the data length to input in bytes **<post_param>**: Numeric/string parameter indicating the HTTP Content-type identifier, used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier: "0[:extension]" – "application/x-www-form-urlencoded" with optional extension "1[:extension]" – "text/plain" with optional extension

#HTTPSND – send HTTP POST or PUT request	
	"2[:extension]" – "application/octet-stream" with optional extension "3[:extension]" – "multipart/form-data" with optional extension other content – free string corresponding to other content type and possible sub-types **<extra_header_line>**: String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported. Note: the HTTP request header sent with #HTTPSND always contains the "Connection: close" line, and it can not be removed. When the HTTP server answer is received, then the following URC is put on the serial port: **#HTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>** Where: **<prof_id>** is defined as above **<http_status_code>** is the numeric status code, as received from the server (see RFC 2616) **<content_type>** is a string reporting the "Content-Type" header line, as received from the server (see RFC 2616) **<data_size>** is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0. Note: if there are no data from server or the server doesn't answer within the time interval specified in **<timeout>** parameter of **#HTTPCFG** command, then the URC **#HTTPRING <http_status_code>** parameter has value 0.

AT#HTTPSND=?	Test command returns the supported range of parameters **<prof_id>, <command>** and **<data_len>** and the maximum length of **<resource>, <post_param>** and **<extra_header_line>** parameters in the format:
	
	# HTTPSND: (list of supported <prof_id>s),(list of supported <command>s), <r_length>, (list of supported <data_len>s),<p_length>,<m_length>
	
	where:
	<r_length> - integer type value indicating the maximum length of parameter
	        <resource>.
	<p_length> - integer type value indicating the maximum length of parameter
	        <post_param>.
	<m_length> - integer type value indicating the maximum length of parameter **<extra_header_line>**

Example	*Post 100 byte without "Content-type" header* **AT#HTTPSND=0,0,"/",100** **>>>**

#HTTPSND – send HTTP POST or PUT request	
	Post 100 byte with "application/x-www-form-urlencoded" **AT#HTTPSND=0,0,"/",100,0** **>>>** *Post 100 byte with "multipart/form-data" and extension* **AT#HTTPSND=0,0,"/",100,"3:boundary=----FormBoundary"** **>>>**

5.6.8.4.   Receive HTTP server data - #HTTPRCV

#HTTPRCV – receive HTTP server data	
AT#HTTPRCV=<prof_id>[,<maxByte>]	Execution command permits the user to read data from HTTP server in response to a previous HTTP module request. The module is notified of these data by the **#HTTPRING** URC. The device shall prompt a three character sequence **<less_than><less_than><less_than>** **(IRA 60, 60, 60)** followed by the data. If reading ends successfully, the response is OK; otherwise an error code is reported. Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 <maxByte> - Max number of bytes to read at a time Range:0,64-1500 (default is 0 which means infinite size) Note: if <maxByte> is unspecified, server data will be transferred all in once. Note: If the data are not present or the **#HTTPRING <http_status_code>** parameter has value 0, an error code is reported.
AT#HTTPRCV=?	Test command reports the supported range of values for **<prof_id>,<maxbyte>** parameter in the format: **# HTTPRCV: (list of supported <prof_id>s,<maxbyte>)**

5.6.9.   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.

Note : **<cellId>** can display valid information when UE910V2 gets the SIB3 Msg from network on the 2G. If UE910V2 doesn't get the SIB3 Msg, **<cellId>** displays to 0.

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 <div align=center>**(For BCCH-Carrier)**</div>**arfcn: <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[<arfcn64>]] [numChannels: <numChannels> array: [<ba1> ..[<ba32>]] [pbcch: <pbcch> [nom: <nom> rac: <rac> spgc: <spgc> pat: <pat> nco: <nco> t3168: <t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh: <pcMeasCh>]]]** **<CR><LF><CR><LF><CR><LF>** where: **<arfcn>** - C0 carrier assigned radio channel (BCCH - Broadcast Control Channel) **<bsic>** - base station identification code; if #CSURVF last setting is 0, **<bsic>** is only applicable for serving cell **<rxLev>** - decimal number; it is the reception level (in dBm) **<ber>** - decimal number; it is the bit error rate (in %). **<ber>** is not available in UE910 V2 family. it is always return 0.00. **<mcc>** - hexadecimal 3-digits number; it is the mobile country code **<mnc>** - hexadecimal 2-digits number; it is the mobile network code **<lac>** - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number **<cellId>** - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number. If **<cellId>** return 0 that means not available.

#CSURV - Network Survey	

	<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.
	(The following informations will be printed only for serving cell)
	<numArfcn> - number of valid channels in the Cell Channel Description
	<arfcn*n*> - arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**)
	<numArfcn> - decimal number; it is the number of valid channels in the Cell Channel Description
	<arfcn*n*> - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**)
	<numChannels> - decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last #CSURVEXT setting:
	   2. if **#CSURVEXT=0** this information is displayed only for serving cell
	   3. Not available about **#CSURVEXT=1** or **2**.
	<ba*n*> - decimal number; it is the arfcn of a valid channel in the BA list (*n* is in the range **1..<numChannels>**); the output of this information for non-serving cells depends on last #CSURVEXT setting:
	   1. if **#CSURVEXT=0** this information is displayed only for serving cell
	   2. Not available about #CSURVEXT=1 or 2.
	(The following informations will be printed only if GPRS is supported in serving cell)
	<pbcch> - packet broadcast control channel
	  0 - pbcch not activated on the cell
	  1 - pbcch activated on the cell
	<nom> - network operation mode
	  1
	  2
	  3
	<rac> - routing area code
	  0..255 -
	<spgc> - SPLIT_PG_CYCLE support
	..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell
	..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell
	<pat> - priority access threshold
	  0 -
	  3..6 -
	<nco> - network control order

#CSURV - Network Survey	

	0..2 -
	<t3168> - timer 3168
	<t3192> - timer 3192
	<drxmax> - discontinuous reception max time (in seconds)
	<ctrlAck> - packed control ack
	<bsCVmax> - blocked sequenc countdown max value
	<alpha> - alpha parameter for power control
	<pcMeasCh> - type of channel which shall be used for downlink measurements for power control
	  0 - BCCH
	  1 - PDCH
	
	               (For non BCCH-Carrier)
	arfcn: <arfcn> rxLev: <rxLev>
	
	where:
	<arfcn> - decimal number; it is the RF channel
	<rxLev> - decimal number; it is the receiption level (in dBm)
	
	In 3G
	
	uarfcn: <uarfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> scr code: <scrcode> cellId: <cellId> lac: <lac> cellStatus: <cellStatus> <CR><LF><CR><LF><CR><LF>
	
	where:
	<uarfcn> - The carrier frequency is designated by the UTRA Absolute Radio
	         Frequency Channel Number
	<rxLev> - decimal number; it is the receiption level (in dBm)
	<mcc> - hexadecimal 3-digits number; it is the mobile country code
	<mnc> - hexadecimal 2-digits number; it is the mobile network code
	<scrcode> - decimal number; it is the scrambling code
	<cellId> - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal
	         number, else it is a 4-digits hexadecimal number
	<lac> - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal
	         number, else it is a 4-digits hexadecimal number
	<cellStatus> - string type; it is the cell status
	..CELL_SUITABLE - C0 is a suitable cell.
	  CELL_LOW_PRIORITY - the cell is low priority based on the received system
	        information.
	  CELL_FORBIDDEN - the cell is forbidden.
	  CELL_BARRED - the cell is barred based on the received system information.
	  CELL_LOW_LEVEL - the cell **<rxLev>** is low.
	  CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH
	        available…etc.

#CSURV - Network Survey	
	Lastly, the **#CSURV** output ends in two ways, depending on the last **#CSURVF** setting: if **#CSURVF=0** or **#CSURVF=1** The output ends with the string: **Network survey ended** if **#CSURVF=2** the output ends with the string: **Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)** where **<NoARFCN>** - number of scanned frequencies **<NoBCCH>** - number of found BCCh
Example	(2G) AT#CSURV Network survey started… arfcn: 48 bsic: 24 rxLev: -52 ber: 0.00 mcc: 610 mnc: 1 lac: 33281 cellId: 3648 cellStatus: CELL_SUITABLE numArfcn: 2 arfcn: 30 48 numChannels: 5 array: 14 19 22 48 82 arfcn: 14 rxLev: 8 Network survey ended OK (wcdma) at#csurv Network survey started ... uarfcn: 10812 rxLev: -87 mcc: 450 mnc: 08 scr code: 6528 cellId: 10683976 lac: 5121 cellStatus: CELL_LOW_PRIORITY uarfcn: 10713 rxLev: -87 mcc: 450 mnc: 05 scr code: 1200 cellId: 2171648 lac: 8209 cellStatus: CELL_LOW_PRIORITY Network survey ended

#CSURV - Network Survey	
	OK
Note	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.
	Parameters:
	<s> - starting channel
	<e> - ending channel
	After issuing the command the device responds with the string:
	Network survey started…
	and, after a while, a list of informations, one for each received carrier, is reported, each of them in the format:
	In 2G
	(For BCCH-Carrier) **<arfcn>,<bsic>,<rxLev>,<ber>,<mcc>,<mnc>,<lac>,<cellId>, <cellStatus>,<numArfcn>[,<arfcn1> ..[<arfcn64>]] [,<numChannels>[,<ba1> ..[<ba32>]]][,<pbcch>[,<nom>,<rac>,<spgc> <pat> <nco> <t3168> <t3192> <drxmax> <ctrlAck> <bsCVmax>,<alpha>,<pcMeasCh>]]] <CR><LF><CR><LF><CR><LF>**
	where:
	<arfcn> - C0 carrier assigned radio channel (BCCH - Broadcast Control Channel)
	<bsic> - base station identification code; if #CSURVF last setting is 0, **<bsic>** is a decimal number, else it is a 2-digits octal number. **<bsic>** is only applicable for serving cell.
	<rxLev> - decimal number; it is the receiption level (in dBm)
	<ber> - decimal number; it is the bit error rate (in %). **<ber>** is not available in UE910 V2 family. it is always return 0.00.
	<mcc> - hexadecimal 3-digits number; it is the mobile country code
	<mnc> - hexadecimal 2-digits number; it is the mobile network code
	<lac> - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number
	<cellId> - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number. If **<cellId>** return 0 that means not available.

#CSURVC - Network Survey (Numeric Format)	

	<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).
	(The following informations will be printed only serving cell)
	<numArfcn> - decimal number; it is the number of valid channels in the Cell Channel Description
	<arfcn*n*> - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**)
	<numChannels> - decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last #CSURVEXT setting:
	    1. if **#CSURVEXT=0** this information is displayed only for serving cell
	    2. Not available about **#CSURVEXT=1** or **2**..
	<ba*n*> - decimal number; it is the arfcn of a valid channel in the BA list (*n* is in the range **1..<numChannels>**); the output of this information for non-serving cells depends on last #CSURVEXT setting:
	    1. if **#CSURVEXT=0** this information is displayed only for serving cell
	    2. Not available about **#CSURVEXT=1** or **2**..
	(The following informations will be printed only if GPRS is supported in serving cell)
	<pbcch> - packet broadcast control channel
	  0 - pbcch not activated on the cell
	  1 - pbcch activated on the cell
	<nom> - network operation mode
	  1
	  2
	  3
	<rac> - routing area code
	  0..255 -
	<spgc> - SPLIT_PG_CYCLE support
	..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell
	..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell
	<pat> - priority access threshold
	  0 -
	  3..6 -
	<nco> - network control order
	  0..2 -
	<t3168> - timer 3168

#CSURVC - Network Survey (Numeric Format)	
	<t3192> - timer 3192
	<drxmax> - discontinuous reception max time (in seconds)
	<ctrlAck> - packed control ack
	<bsCVmax> - blocked sequenc countdown max value
	<alpha> - alpha parameter for power control
	<pcMeasCh> - type of channel which shall be used for downlink measurements for power control
	0 - BCCH
	1 - PDCH
	(For non BCCH-Carrier)
	<arfcn>,<rxLev>
	where:
	<arfcn> - decimal number; it is the RF channel
	<rxLev> - decimal number; it is the receiption level (in dBm)
	In 3G
	<uarfcn>,<rxLev>,<mcc>,<mnc>,<scrcode>,<cellId>,<lac>,<cellStatus> **<CR><LF><CR><LF><CR><LF>**
	where:
	<uarfcn> - The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number
	<rxLev> - decimal number; it is the receiption level (in dBm)
	<mcc> - hexadecimal 3-digits number; it is the mobile country code
	<mnc> - hexadecimal 2-digits number; it is the mobile network code
	<scrcode> - decimal number; it is the scrambling code
	<cellId> - cell identifier; if #CSURVF last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number
	<lac> - location area code; if #CSURVF last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number
	<cellStatus> - string type; it is the cell status
	..CELL_SUITABLE - C0 is a suitable cell.
	CELL_LOW_PRIORITY - the cell is low priority based on the received system information.
	CELL_FORBIDDEN - the cell is forbidden.
	CELL_BARRED - the cell is barred based on the received system information.
	CELL_LOW_LEVEL - the cell **<rxLev>** is low.
	CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH available…etc.
	The last information from **#CSURVC** depends on the last **#CSURVF** setting:
	#CSURVF=0 or **#CSURVF=1**

#CSURVC - Network Survey (Numeric Format)	
	The output ends with the string: **Network survey ended** **#CSURVF=2** the output ends with the string: **Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)** where **<NoARFCN>** - number of scanned frequencies **<NoBCCH>** - number of found BCCh
Example	AT#CSURVC Network survey started… 48,24,-52,0.00,610,1,33281,3648,0,2,30 48,5,14 19 22 48 82 14,8 Network survey ended OK
Note	The command is executed within max. 2 minute. The information provided by **#CSURVC** is the same as that provided by #CSURV. The difference is that the output of **#CSURVC** is in numeric format only.

5.6.9.3.   Network Survey Of User Defined Channels - #CSURVU

#CSURVU - Network Survey Of User Defined Channels	
AT#CSURVU=[<ch1>[,<ch2>[,… [,<ch10>]]]]	Execution command allows to perform a quick survey through the given channels. The range of available channels depends on the last #BND issue. The result format is like command #CSURV. Parameters: **<chn>** - channel number (ARFCN (in case of 2G), UARFCN (in case of 3G)) Note: the <chn> must be selected in same RAT.
Example	AT#CSURVU=59,110 Network survey started… arfcn: 59 bsic: 16 rxLev: -76 ber: 0.00 mcc: 546 mnc: 1 lac: 54717 cellId: 21093 cellStatus: CELL_SUITABLE numArfcn 2 arfcn: 36 59

#CSURVU - Network Survey Of User Defined Channels	
	arfcn: 110 rxLev: -107 Network survey ended OK
Note	The command is executed within max. 2 minute.

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

#CSURVUC - Network Survey Of User Defined Channels (Numeric Format)	
AT#CSURVUC=[<ch1>[,<ch2>[,… [,<ch10>]]]]	Execution command allows to perform a quick survey through the given channels. The range of available channels depends on the last #BND issue. The result format is like command **#CSURVC**. Parameters: **<ch*n*>** - channel number (ARFCN (in case of 2G), UARFCN (in case of 3G)) Note: the <chn> must be selected in same RAT.
Example	AT#CSURVUC=59,110 Network survey started… 59,16,-76,0.00,546,1,54717,21093,0,2,36 59 110,-107 Network survey ended OK
Note	The command is executed within max. 2 minute. The information provided by **#CSURVUC** is the same as that provided by #CSURVU. The difference is that the output of **#CSURVUC** is in numeric format only.

5.6.9.5.   BCCH Network Survey - #CSURVB

#CSURVB - BCCH Network Survey	
AT#CSURVB=	Execution command performs a quick network survey through **M** (maximum

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

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

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

5.6.9.7. Network Survey Format - #CSURVF

#CSURVF - Network Survey Format	

AT#CSURVF= [<format>]	Set command controls the format of the numbers output by all the Easy Scan®
	
	 Parameter:
	 <format> - numbers format
	   0 - Decimal
	   1 - Hexadecimal values, no text
	   2 - Hexadecimal values with text

AT#CSURVF?	Read command reports the current number format, as follows: **#CSURVF: <format>**

#CSURVF - Network Survey Format	
AT#CSURVF=?	Test command reports the supported range of values for the parameter **<format>**.

5.6.9.8.   <CR><LF> Removing On Easy Scan® Commands Family – #CSURVNLF

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

AT#CSURVNLF= [<value>]	Set command enables/disables the automatic **<CR><LF>** removing from each information text line.
	
	Parameter:
	<value>
	  0 - disables **<CR><LF>** removing; they'll be present in the information text (factory default)
	  1 - remove **<CR><LF>** from imformation text

AT#CSURVNLF?	Read command reports whether automatic **<CR><LF>** removing is currently enabled or not, in the format: **<value>**
AT#CSURVNLF=?	Test command reports the range of values for parameter **<value>.**

5.6.9.9.   Extended Network Survey – #CSURVEXT

#CSURVEXT - Extended Network Survey	

AT#CSURVEXT [=<value>]	Set command enables/disables extended network survey.
	
	Parameter:
	<value>
	  0 - disables extended network survey (factory default)
	  1 - enables extended network survey; all the network survey execution commands (#CSURV, #CSURVC, #CSURVU, #CSURVUC, #CSURVB, #CSURVBC) display the BAList for every valid scanned BCCh carrier
	  2 - enables extended network survey; all the network survey execution commands (#CSURV, #CSURVC, #CSURVU, #CSURVUC, #CSURVB, #CSURVBC) display the BAList for every valid scanned BCCh carrier and, if GPRS is supported in the cell, they report some GPRS informations carried by the System Information 13 of the BCCh
	
	Note : this command is only available on serving cell in 2G network and for the other cell such as neighbour cell in 2G or 3G-RAT, the command is not available.

AT#CSURVEXT?	Read command reports whether extended network survey is currently enabled or not, in the format: **<value>**
AT#CSURVEXT=?	Test command reports the range of values for parameter **<value>.**

5.6.9.10.   PLMN Network Survey - #CSURVP

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

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

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

5.6.10.   SIM Toolkit AT Commands

5.6.10.1.   SIM Tookit Interface Activation - #STIA

#STIA - SIM Tookit Interface Activation	

AT#STIA=
[<mode>
[,<timeout>]]
	Set command is used to activate the SAT sending of unsolicited indications when a **proactive command** is received from SIM.
	
	Parameters:
	<mode>
	  0 - disable SAT (no **<timeout>** required, if given will be ignored)
	  1 - enable SAT without unsolicited indication **#STN** (default)
	  2 - enable SAT and extended unsolicited indication **#STN** (see #STGI)
	  3 - enable SAT and reduced unsolicited indication **#STN** (see #STGI)
	  17 - enable SAT without unsolicited indication #**STN** and 3GPP TS 23.038 alphabet used
	  18 - enable SAT and extended unsolicited indication #**STN** (see #STGI) . only GSM default alphaber is supported
	  19 - enable SAT and reduced unsolicited indication #**STN** (see #STGI). only GSM default alphabet is supported
	  33 - enable SAT without unsolicited indication #**STN** and UCS2 alphabet used
	  34 - enable SAT with extended unsolicited indication #**STN** (see #STGI). only

#STIA - SIM Tookit Interface Activation	

	UCS2 character set is supported
	  35 - enable SAT with reduced unsolicited indication **#STN** (see #STGI). only UCS2 character set is supported
	<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:
	
	  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.

#STIA - SIM Tookit Interface Activation	
	• **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 3GPP TS 31.111):
	#STN: \<cmdType>[,\<text>]
	where: **\<text>** - (optional) text to be displayed to user
	In these cases neither #STGI nor #STSR commands are required: • **AT#STGI** is accepted anyway. • **AT#STSR=\<cmdType>,0** will answer **OK** but do nothing.
	In case of SEND SHORT MESSAGE (**\<cmdType>**=19) command if sending to network fails an unsolicited notification will be sent
	#STN: 119
	if \<cmdType>=33 (DISPLAY TEXT)
	an unsolicited notification will be sent if allowed by SIM (see 3GPP TS 31.111):
	#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

#STIA - SIM Tookit Interface Activation

	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>=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 3GPP TS 31.111)
- '00' = MT call
- '01' = Call connected
- '02' = Call disconnected
- '03' = Location status
- '04' = User activity
- '05' = Idle screen available
- '06' = Card reader status (if class "a" is supported)
- '07' = Language selection
- '08' = Browser Termination (if class "c" is supported)
- '09' = Data available (if class "e" is supported)
- '0A' = Channel status (if class "e" is supported)

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

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

#STIA - SIM Tookit Interface Activation	
	All other commands:
	the unsolicited indication will report just the proactive command type:
	#STN: <cmdType>
	Note: if the **call control** or **SMS control facility in the SIM** is activated, when the customer application makes an outgoing call, or sends an SS or USSD, or an SMS, the following **#STN** unsolicited indication could be sent, according to 3GPP TS 31.111, 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: when the SIM Application enters its main menu again (i.e. not at startup) an unsolicited result code
	#STN: 254
	is sent.
	The TA does not need to respond directly, i.e. **AT#STSR** is not required. It is possible to restart the SAT session from the main menu again with the command **AT#STGI=37**.
	Note: The settings are saved on user profile and available on following reboot. SIM Toolkit activation/deactivation is only performed at power on.
AT#STIA?	Read command can be used to get information about the SAT interface in the format:

#STIA - SIM Tookit Interface Activation	
	#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 3GPP TS 31.111, 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)**

5.6.10.2.　SIM Tookit Get Information – #STGI

#STGI - SIM Tookit Get Information	
AT#STGI= [<cmdType>]	**#STGI** set command is used to request the parameters of a **proactive command** from the ME. Parameter: **<cmdType>** - **proactive command** ID according to 3GPP TS 102.223 (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 ENENT LIST 16 - SET UP CALL 17 - SEND SS

#STGI - SIM Tookit Get Information	
	18 - SEND USSD 19 - SEND SHORT MESSAGE 20 - SEND DTMF 32 - PLAY TONE 33 - DISPLAY TEXT 34 - GET INKEY 35 - GET INPUT 36 - SELECT ITEM 37 - SET UP MENU 40 - SET UP IDLE MODE TEXT Requested command parameters are sent using an **#STGI** indication: **#STGI: <parameters>** where **<parameters>** depends upon the ongoing **proactive command** as follows: *if <cmdType>=1 (REFRESH)* **#STGI: <cmdType>,<refresh type>** where: **<refresh type>** 0 - SIM Initialization and Full File Change Notification; 1 - File Change Notification; 2 - SIM Initialization and File Change Notification; 3 - SIM Initialization; 4 - SIM Reset *if <cmdType>=5 (SET UP EVENT LIST)* **#STGI: <cmdType>,<event list mask>** where: **<event list mask>** - hexadecimal number representing the list of events to monitor (see 3GPP TS 31.111): - '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

#STGI - SIM Tookit Get Information	

	that the corresponding event has to be monitored (e.g.,
	
	 if <cmdType>=16 (SET UP CALL)
	
	 #STGI: <cmdType>,<cmdDetails>,[<confirmationText>], <calledNumber>
	
	 where:
	 <cmdDetails> - unsigned integer, used as an enumeration
	  0 - Set up call, but only if not currently busy on another call
	  1 - Set up call, but only if not currently busy on another call, with redial
	  2 - Set up call, putting all other calls (if any) on hold
	  3 - Set up call, putting all other calls (if any) on hold, with redial
	  4 - Set up call, disconnecting all other calls (if any)
	  5 - Set up call, disconnecting all other calls (if any), with redial
	 <confirmationText> - string for user confirmation stage
	 <calledNumber> - string containing called number
	
	      if <cmdType>=17 (SEND SS)
	      if <cmdType>=18 (SEND USSD)
	      if <cmdType>=19 (SEND SHORT MESSAGE)
	      if <cmdType>=20 (SEND DTMF)
	      if <cmdType>=32 (PLAY TONE)
	      if <cmdType>=40 (SET UP IDLE MODE TEXT)
	
	 #STGI: <cmdType>[,<text>]
	
	 where:
	 <text> - text to be displayed to user
	
	 if <cmdType>=33 (DISPLAY TEXT)
	
	 #STGI: <cmdType>,<cmdDetails>[,<text>]
	
	 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

#STGI - SIM Tookit Get Information

	if <cmdType>=34 (GET INKEY)
	
	#STGI: <cmdType>,<cmdDetails>,<text>
	
	where:
	<cmdDetails> - 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 3GPP TS 31.111) is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.
	    bit 4:

#STGI - SIM Tookit Get Information	
	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>**

#STGI - SIM Tookit Get Information	

	<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:

#STGI - SIM Tookit Get Information	
	<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**.

5.6.10.3. SIM Tookit Send Response - #STSR

#STSR - SIM Tookit Send Response	

AT#STSR=
 [<cmdType>,
 <userResponse>
 [,<data>]]
	The write command is used to provide to SIM user response to a command and any required user information, e.g. a selected menu item.
	
	 Parameters:
	 <cmdType> - integer type; **proactive command** ID according to 3GPP TS 31.111 (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

#STSR - SIM Tookit Send Response	
	<data> - data entered by user, depending on **<cmdType>**, only required if **<Result>** is 0: ***Get Inkey*** **<data>** contains the key pressed by the user; used character set should be the one selected with +**CSCS** Note: if, as a user response, a binary choice (Yes/No) is requested by the SIM application using bit 3 of the **<commandDetails>** parameter the valid content of the **<inputString>** is: a) "IRA", "8859-1", "PCCP437" charsets: "Y" or "y" (positive answer) and "N" or "n" (negative answer) b) UCS2 alphabet "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer) ***Get Input*** **<data>** - contains the string of characters entered by the user (see above) ***Select Item*** **<data>** - contains the item identifier selected by the user Note: Use of icons is not supported. All icon related actions will respond with no icon available.
AT#STSR?	The read command can be used to request the currently ongoing **proactive command** and the SAT state in the format **#STSR: <state>,<cmdType>** where: **<state>** - SAT interface state (see **#STIA)** **<cmdType>** - ongoing proactive command 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>**.

5.6.10.4.   SIM Tookit Terminal Attach - #STTA

#STTA – SIM Toolkit Terminal Attach	
AT#STTA=<state>	This command attaches/detaches the SIM Toolkit application to the AT instance reserved for this use. Parameters: **<state>:** attached state 0 – SIM Toolkit detaches 1 – SIM Toolkit attaches If SIM Toolkit application has been already attached/detached the command does nothing and returns OK.
AT#STTA?	Read command reports the current **<state>** in the format:

#STTA – SIM Toolkit Terminal Attach	
	#STTA: <state>
AT#STTA=?	Test command reports the supported range of values for parameter **<state>**

5.6.11.   Jammed Detect & Report AT Commands

5.6.11.1.   Jammed Detect & Report - #JDR

#JDR - Jammed Detect & Report	

AT#JDR= [<mode> [,<MNPL>, <DCMN>]]	Set command allows to control the Jammed Detect & Report feature.
	
	The MODULE can detect if a communication Jammer is active in its range and give indication to the user of this condition either on the serial line with an unsolicited code or on a dedicated GPIO by rising it.
	
	The MODULE can also report to the network the Jammed status condition, even if normal communications are inhibited by the Jammer, by using a unique message.
	
	Parameters:
	<mode> - behaviour mode of the Jammed Detect & Report
	  0 - disables Jammed Detect & Report (factory default)
	  1 - enables the Jammed Detect; the Jammed condition is reported on pin GPIO2/JDR
	      GPIO2/JDR **Low** - Normal Operating Condition
	      GPIO2/JDR **High** - Jammed Condition.
	  2 - enables the Jammed Detect; the Jammed condition is reported with a single unsolicited result code on serial line, in the format:
	
	   #JDR: <status>
	   where:
	   <status>
	     JAMMED - Jammed condition detected
	     OPERATIVE - Normal Operating condition restored. This code will be shown only after a jammed condition has occurred.
	  3 - enables the Jammed Detect; the MODULE will make both the actions as for **<mode>=1** and **<mode>=2**.
	  4 - enables the Jammed Detect; the Jammed condition is reported with an unsolicited code every 3s on serial line, in the format:
	
	   #JDR: <status>
	   where:
	   <status>
	     JAMMED - Jammed condition detected
	     OPERATIVE - Normal Operating condition restored. This code will be shown only after a jammed condition has occurred.

#JDR - Jammed Detect & Report	

	5 - enables the Jammed Detect; the MODULE will make both the actions as for **<mode>=1** and **<mode>=4**.
	
	6 - enables the Jammed Detect; the Jammed condition is reported in the format:
	  #JDR: <status>
	  where:
	  <status>
	  JAMMED - Jammed condition detected
	  OPERATIVE - Normal Operating condition restored. This code will be shown only after a jammed condition has occurred
	  UNKNOWN – default state before first successful PLMN searching
	
	<MNPL> - Maximum Noise Power Level
	0..127(factory default is 70)
	
	<DCMN> - Disturbed Channel Minimum Number
	0..254(factory default is 5)

AT#JDR?	Read command reports the current behaviour mode, Maximum Noise Power Level and Disturbed Channel Minimum Number, in the format: **#JDR: <mode>,<MNPL>,<DCMN>**
AT#JDR=?	Test command reports the supported range of values for the parameters **<mode>**,**<MNPL>** and **<DCMN>**
Example	AT#JDR=2 OK *…jammer enters in the range…* #JDR: JAMMED *…jammer exits the range…* #JDR: OPERATIVE AT#JDR=6 #JDR: JAMMED //when jammed OK AT#JDR=6 #JDR: OPERATIVE //when in normal operating mode OK AT#JDR=6 #JDR: UNKNOWN // default state before 1st PLMN searching OK
Note	It is suggested not to change the default setting for Maximum Noise Power Level and Disturbed Channel Minimum Number. If the device is installed in a particular environment where the default values are not satisfactory the two parameters **<MNPL>** and **<DCMN>** permit to adapt the detection to all conditions.

5.6.12.   SAP AT Commands Set

5.6.12.1.   Remote SIM Enable - #RSEN

#RSEN – Remote SIM Enable	
AT#RSEN=<mode>[, <sapformat>[, <role>[, <muxch>[, <beacon>]]]]	Set command is used to enable/disable the Remote SIM feature. Parameters: **<mode>** 0 - disable 1 - enable **<sapformat>** 1 - binary SAP (default) **<role>** 0 - remote SIM Client (default) 1 - remote SIM Server (unsupported) **<muxch>** - MUX Channel Number; mandatory if **<mode>=1** and **<sapformat>=1** 1..3 - dummy value **<beacon>** - retransmition timer of SAP Connection Request 0 - only one transmition (default) 1..100 - timer interval in seconds. NOTES: If the module has a SIM inserted, when it receives the enable Command: - de-register from the actual network - de-initialize the current SIM. NOTE for **<sapformat>=1** (binary SAP): while RSEN is activate SAP connection status is signalled with following URC: **#RSEN: <conn>** where **<conn>** - connection status 0 - disconnected 1 - connected
AT#RSEN?	Read command returns the connection status of Remote SIM feature
AT#RSEN=?	Test command returns all supported values of Remote SIM Enable command

5.6.13. Audio AT commands

5.6.13.1. Audio Basic configuration

5.6.13.1.1. Change Audio Path - #CAP

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

5.6.13.1.2. Select Ringer Sound - #SRS

#SRS - Select Ringer Sound	

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

AT#SRS?	Read command reports current selected ringing and its status in the form:

#SRS - Select Ringer Sound	

	#SRS: <n>,<status>
	
	where:
	<n> - ringing tone number
	  1..*max*
	<status> - ringing status
	  0 - selected but not playing
	  1 - currently playing

AT#SRS=?	Test command reports the supported values for the parameters **<n>** and **<tout>**

5.6.13.1.3. Select Ringer Path – #SRP

#SRP - Select Ringer Path	
AT#SRP=<n>	It has no effect and is included only for backward compatibility. Parameter: **<n>**: (0-3)
AT#SRP?	Read command reports the selected ringer path in the format: **#SRP: <n>**.
AT#SRP=?	Test command reports the supported values for the parameter **<n>**.
Example	AT#SRP=? #SRP: (0-3) OK AT#SRP=3 OK

5.6.13.1.4. Handsfree Microphone Gain – #HFMICG

#HFMICG - Handsfree Microphone Gain	
AT#HFMICG= <level>	Set command sets the handsfree microphone input gain Parameter: **<level>**: handsfree microphone input gain 0..7 - handsfree microphone gain (+6dB/step) Factory default: UE910-V2 NAx : 6 by default UE910-V2 EUx : 4 by default
AT#HFMICG?	Read command returns the current handsfree microphone input gain, in the format: **#HFMICG: <level>**
AT#HFMICG=?	Test command returns the supported range of values of parameter **<level>**.

5.6.13.1.5. Handset Microphone Gain – #HSMICG

#HSMICG - Handset Microphone Gain	

AT#HSMICG= <level>	Set command sets the handset microphone input gain
	
	Parameter:
	<level>: handset microphone input gain
	  0..7 - handset microphone gain (+6dB/step)
	
	Factory default:
	UE910-V2 NAx : 6 by default
	  UE910-V2 EUx : 4 by default

AT#HSMICG?	Read command returns the current handset microphone input gain, in the format: **#HSMICG: <level>**
AT#HSMICG=?	Test command returns the supported range of values of parameter **<level>**.

5.6.13.1.6.   Handsfree Receiver Gain - #HFRECG

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

5.6.13.1.7.   Handset Receiver Gain - #HSRECG

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

5.6.13.1.8.   DVI Microphone Gain - #PCMTXG

#PCMTXG – DVI Microphone Gain

AT#PCMTXG=<TX_VOL>	Set command sets the DVI (PCM) Audio TX gain Parameter: **<TX_VOL>** : PCM TX volume in TX path (factory default : 0) TX VOL RANGE : -5000(-50 dB) ~ 1200(+12 dB) Note: meaning of a TX_VOL is 1/100 dB step. Note: meaning of -50 dB is mute
AT#PCMTXG?	Read command returns the current PCM Audio TX value: **#PCMTXG: <TX_VOL>**
AT#PCMTXG=?	Test command returns the supported range of values of parameter **<TX_VOL>**

5.6.13.1.9.   DVI Speaker Volume Level - #PCMRXG

#PCMRXG – DVI Speaker Volume Level

AT#PCMRXG=<RX_VOL>	Set command sets the PCM Audio RX value Parameter: **<RX_VOL>** : PCM RX volume in RX path (factory default : 0) RX_VOL RANGE : -5000(-50 dB) ~ 1200(+12 dB) Note: meaning of a RX_VOL is 1/100 dB step. Note: meaning of -50 dB is mute
AT#PCMRXG?	Read command returns the current PCM Audio RX value: **#PCMRXG: <RX VOL>**
AT#PCMRXG=?	Test command returns the supported range of values of parameter **<RX VOL>**

5.6.13.1.10.   Set Headset Sidetone - #SHFSD

#SHFSD - Set Headset Sidetone

AT#SHFSD=
<mode>
	Set command enables/disables the sidetone on headset audio output.
	
	Parameter:
	<mode>
	  0 - disables the headset sidetone (factory default)
	  1 - enables the headset sidetone.
	
	Note: This setting returns to default after power off.

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

5.6.13.1.11.   Set Handset Sidetone – #SHSSD

#SHSSD - Set Handset Sidetone	

AT#SHSSD= \<mode>	Set command enables/disables the sidetone on handset audio output.
	
	Parameter:
	\<mode>
	  0 - disables the handset sidetone (factory default)
	  1 - enables the handset sidetone
	
	Note: This parameter is saved in NVM issuing AT&W command.

AT#SHSSD?	Read command reports whether the headset sidetone is currently enabled or not, in the format: **#SHSSD: \<mode>**
AT#SHSSD=?	Test command returns the supported range of values of parameter **\<mode>**.

5.6.13.1.12.   Speaker Mute Control – #SPKMUT

#SPKMUT - Speaker Mute Control	

AT#SPKMUT=\<n>	Set command enables/disables the global muting of the speaker audio line, for every audio output (ring, incoming sms, voice, Network coverage)
	
	Parameter:
	\<n>
	  0 - mute off, speaker active (factory default)
	  1 - mute on, speaker muted.
	
	Note: this command mutes/activates both speaker audio paths, internal speaker and external speaker.

AT#SPKMUT?	Read command reports whether the muting of the speaker audio line during a voice call is enabled or not, in the format: **#SPKMUT: \<n>**
AT#SPKMUT=?	Test command reports the supported values for **\<n>** parameter.

5.6.13.1.13.   Open Audio Loop – #OAP

#OAP – Open Audio Loop	
AT#OAP= \<mode>	Set command sets Open Audio Path. Parameter:

	0 - disables Open Audio Path (factory default) 1 - enables Open Audio Path *Note: This parameter is not saved in NVM*
AT#OAP?	Read command returns the current Open Audio Path, in the format: **#OAP: <mode>**
AT#OAP =?	Test command returns the supported range of values of parameter **<mode>**.

5.6.13.2.   Tones configuration

5.6.13.2.1.   *Signalling Tones Mode - #STM*

#STM - Signalling Tones Mode	

AT#STM=
<mode>
	Set command enables/disables the signalling tones output on the audio path selected with **#SRP** command
	
	Parameter:
	<mode> - signalling tones status
	  0 - signalling tones disabled
	  1 - signalling tones enabled (factory default)
	  2 – all tones disabled
	
	Note: **AT#STM=0** has the same effect as **AT+CALM=2**; **AT#STM=1** has the same effect as AT+CALM=**0**.

AT#STM?	Read command reports whether the current signaling tones status is enabled or not, in the format: **#STM: <mode>**
AT#STM=?	Test command reports supported range of values for parameter **<mode>**.

5.6.13.2.2.   *Tone Playback - #TONE*

#TONE - Tone Playback	

AT#TONE=<tone>
[,<duration>]
	Execution command allows the playback of either a single DTMF tone or a dial tone for a specified period of time.
	
	Parameters:
	<tone> - tone to be reproduced
	  (0-9), #, *, (A-D) - dtmf tone
	  (G-L) - user defined tones
	  Y - free tone
	  Z - busy tone
	<duration> - playback duration in 1/10 sec.
	  1..300 - tenth of seconds (default is 30)

AT#TONE=?	Test command returns the supported range of values for parameters **<tone>** and **<duration>**.

5.6.13.2.3.   Extended tone generation – #TONEEXT

#TONEEXT – Extended tone generation	

AT# TONEEXT= <toneId>,<act>	Execution command allows the reproduction of DTMF tones, standard free tone, standard busy tone and a set of user defined tones for a infinite time, or stop the running tone
	
	Parameters:
	< toneId > - ASCII characters in the set **(0-9), #,*,(A-D),(G-L),Y,Z** ;
	   - (0-9), #,*,(A-D) : DTMF tone
	   - (G-L) : User Defined Tones[5].
	   - y : free tone
	   - z: busy tone
	< act > - Action to be performed.
	   - 0: Stop the <toneId> if running.
	   - 1: Start the <toneId>.

AT#TONEEXT=?	Test command returns the range of supported values for parameter **<toneId>,<act>.**

5.6.13.2.4.   Tone Classes Volume #TSVOL

#TSVOL – Tone Classes Volume	
AT#TSVOL= <class>, <mode> [,<volume>]	Set command is used to select the volume mode for one or more tone classes. Parameters: **<class>** -sum of integers each representing a class of tones which the command refers to 1 - GSM tones 2 - ringer tones 4 - alarm tones 8 - signaling tones 16 - DTMF tones 32 - SIM Toolkit tones 64 - user defined tones 128 - Dial tones 255 - all classes **<mode>** - it indicates which volume e're using for the classes of tones represented by **<class>** 0 - we're using default volume 1 - we're using the volume **<volume>**. **<volume>** - volume to be applied to the set of classes of tones represented by **<class>**; it is mandatory if **<mode>** is **1**. 0..*max* - the value of *max* can be read issuing the Test command **AT#TSVOL=?**
AT#TSVOL?	Read command returns for each class of tones the last setting of **<mode>**

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[5] See also AT#UDTSET, AT#UDTRST and AT#UDTSAV command description following in this document.

#TSVOL – Tone Classes Volume	
	and, if **<mode>** is not **0**, of **<volume>** too, in the format: **#TSVOL:1,<mode1>[,<volume1>]<CR><LF>** **…** **#TSVOL:64,<mode64>[,<volume64>]** Note: no info is returned for class 128.
AT#TSVOL=?	Test command returns the supported range of values of parameters **<class>**, **<mode>** and **<volume>**.
Example	at#tsvol=84,1,5 OK at#tsvol? #TSVOL:1,0 #TSVOL:2,0 #TSVOL:4,1,5 #TSVOL:8,0 #TSVOL:16,1,5 #TSVOL:32,0 #TSVOL:64,1,5 OK

5.6.13.2.5.   User Defined Tone SET - #UDTSET

# UDTSET – User Defined Tone SET	
AT#UDTSET= **<tone>** **,<F1>,<A1>** **[,<F2>,<A2>** **[,<F3>,<A3>]]**	Set command sets frequency and amplitude composition for a User Defined Tone. Parameters: **<tone>** - tone index (G,L) **<Fi >** - frequency in Hz (300,3000) **<Ai >** - amplitude in dB (10,100)
AT# UDTSET?	Read command returns the current settings for the tones: #UDTSET: G,F1,A1,F2,A2,F3,A3 #UDTSET: H,F1,A1,F2,A2,F3,A3 #UDTSET: I,F1,A1,F2,A2,F3,A3 #UDTSET: J,F1,A1,F2,A2,F3,A3 #UDTSET: K,F1,A1,F2,A2,F3,A3 #UDTSET: L,F1,A1,F2,A2,F3,A3
AT# UDTSET =?	Test command returns the supported range of values for tones indexes, frequency and amplitude.

5.6.13.2.6.   Save User Defined Tones - #UDTSAV

#UDTSAV – Save User Defined Tones	
AT#UDTSAV	Execution command save the actual values of frequency and amplitude for the user defined tones to the default set. The parameters to reset are :

#UDTSAV – Save User Defined Tones	
	- G F1 A1 F2 A2 F3 A3 - H F1 A1 F2 A2 F3 A3 - I F1 A1 F2 A2 F3 A3 - J F1 A1 F2 A2 F3 A3 - K F1 A1 F2 A2 F3 A3 - L F1 A1 F2 A2 F3 A3
AT#UDTSAV=?	Test command returns the **OK** result code.
Example	AT#UDTSAV OK *Current tones are saved in NVM*

5.6.13.2.7. *User Defined Tone Reset - #UDTRST*

#UDTRST – User Defined Tone Reset	
AT#*UDTRST*	Execution command resets the actual values of frequency and amplitude for the user defined tones to the default set. The parameters to reset are : - G F1 A1 F2 A2 F3 A3 - H F1 A1 F2 A2 F3 A3 - I F1 A1 F2 A2 F3 A3 - J F1 A1 F2 A2 F3 A3 - K F1 A1 F2 A2 F3 A3 - L F1 A1 F2 A2 F3 A3
AT#*UDTRST* =?	Test command returns the **OK** result code.

5.6.13.3. Audio profiles

5.6.13.3.1. *Audio Profile* Factory *Configuration - #PRST*

#PRST - Audio Profile Factory Configuration	
AT#PRST	Execution command resets the actual audio parameters in the NVM of the device to the default set. It is not allowed if active audio profile is 0. The audio parameters to reset are: - Uplink path biquad filters - Downlink path biquad filters
AT#PRST=?	Test command returns the **OK** result code.
Example	AT#PRST OK *Current audio profile is reset*

5.6.13.3.2. Audio Profile Configuration Save – #PSAV

#PSAV - Audio Profile Configuration Save	

AT#PSAV	Execution command saves the actual audio parameters in the NVM of the device. It is not allowed if active audio profile is 0.
	
	The audio parameters to store are:
	
	    - Uplink path biquad filters
	    - Downlink path biquad filters

AT#PSAV=?	Test command returns the **OK** result code.
Example	AT#PSAV OK *Current audio profile is saved in NVM*

5.6.13.3.3. Audio Profile Selection – #PSEL

#PSEL - Audio Profile Selection	

AT#PSEL=<prof>	Set command selects the active audio profile
	
	Parameter:
	<prof>: current profile
	  0 - standard profile
	  1..3 - extended profile, modifiable.
	
	Note: This parameter is saved in NVM issuing AT&W command.

AT#PSEL?	The read command returns the active profile in the format: **#PSEL:<prof>**
AT#PSEL=?	Test command returns the supported range of values of parameter **<prof>**.

5.6.13.4. Audio Filters

5.6.13.4.1. Uplink Path Biquad Filters – #BIQUADIN

#BIQUADIN - Uplink Path Biquad Filters	
AT#BIQUADIN= **<a$_{F0}$>** **[,<a$_{F1}$>** **[,<a$_{F2}$>** **[,<b$_{F1}$>** **[,<b$_{F2}$>** **[,<a$_{S0}$>** **[,<a$_{S1}$>** **[,<a$_{S2}$>** **[,<b$_{S1}$>** **[,<b$_{S2}$>**	Set command allows to configure the parameters of the two cascaded digital **biquad filters** $H_{First}(z) \cdot H_{Second}(z)$ in Uplink path (sending). It is not allowed if active audio profile is 0. Parameters: **<a$_{Fn}$>,<b$_{Fn}$>,<a$_{Sn}$>,<b$_{Sn}$>** - they all are specific parameters for the calculation of digital **biquad filters** as follows: $$H_F(z) = \frac{a_{F0} + a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

]]]]]]]]]]	$$H_S(z) = \frac{a_{S0} + a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ 0.. FFFFFFFF - each value has to be interpreted as signed fixed point number in two's complement format with 31 fractional bits in a 32 bit word (Q31) Note: Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.
AT#BIQUADIN?	Read command returns the parameters for the active profile in the format: **#BIQUADIN:** **<a_{F0}>,<a_{F1}>,<a_{F2}>,<b_{F1}>,<b_{F2}>,<a_{S0}>,<a_{S1}>,<a_{S2}>,<b_{S1}>,<b_{S2}>** It is not allowed if active audio profile is 0.
AT#BIQUADIN=?	Test command returns the supported range of values for parameters **<a_{F0}>**, **<a_{F1}>**, **<a_{F2}>**, **<b_{F1}>**, **<b_{F2}>**, **<a_{S0}>**, **<a_{S1}>**, **<a_{S2}>**, **<b_{S1}>**, **<b_{S2}>**

5.6.13.4.2.   Extended Uplink Biquad Filters - #BIQUADINEX

#BIQUADINEX – Extended Uplink Biquad Filters	
AT#BIQUADINEX= **<a_{F0}>** **[,<a_{F1}>** **[,<a_{F2}>** **[,<b_{F1}>** **[,<b_{F2}>** **[,<a_{S0}>** **[,<a_{S1}>** **[,<a_{S2}>** **[,<b_{S1}>** **[,<b_{S2}>** **]]]]]]]]]]**	Set command allows to configure the parameters of the two extended digital **biquad filters** $H_{First}(z) \cdot H_{Second}(z)$ in Uplink path (sending). It is not allowed if active audio profile is 0. Parameters: **<a_{Fn}>,<b_{Fn}>,<a_{Sn}>,<b_{Sn}>** - they all are specific parameters for the calculation of digital **biquad filters** as follows: $$H_F(z) = \frac{a_{F0} + a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ $$H_S(z) = \frac{a_{S0} + a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ 0.. FFFFFFFF - each value has to be interpreted as signed fixed point number in two's complement format with 31 fractional bits in a 32 bit word (Q31) Note: Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.

AT#BIQUADINEX?	Read command returns the parameters for the active profile in the format: **#BIQUADINEX:** **<a_{F0}>,<a_{F1}>,<a_{F2}>,<b_{F1}>,<b_{F2}>,<a_{S0}>,<a_{S1}>,<a_{S2}>,<b_{S1}>,<b_{S2}>** Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.
AT#BIQUADINEX=?	Test command returns the supported range of values for parameters **<a_{F0}>, <a_{F1}>, <a_{F2}>, <b_{F1}>, <b_{F2}>, <a_{S0}>, <a_{S1}>, <a_{S2}>, <b_{S1}>, <b_{S2}>**

5.6.13.4.3. Second Extended Uplink Biquad Filters - #BIQUADINEXS

#BIQUADINEXS– Second Extended Uplink Biquad Filters	
AT#BIQUADINEXS= <a_{F0}> [,<a_{F1}> [,<a_{F2}> [,<b_{F1}> [,<b_{F2}>]]]]	Set command allows to configure the parameters of the two extended digital **biquad filters** $H_{First}(z)$ in Uplink path (sending). It is not allowed if active audio profile is 0. Parameters: **<a_{Fn}>,<b_{Fn}>** - they all are specific parameters for the calculation of digital **biquad filters** as follows: $$H_F(z) = \frac{a_{F0} + a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ 0.. FFFFFFFF - each value has to be interpreted as signed fixed point number in two's complement format with 31 fractional bits in a 32 bit word (Q31) Note: Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.
AT#BIQUADINEXS?	Read command returns the parameters for the active profile in the format: **#BIQUADINEXS: <a_{F0}>,<a_{F1}>,<a_{F2}>,<b_{F1}>,<b_{F2}>** Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.
AT#BIQUADINEXS=?	Test command returns the supported range of values for parameters **<a_{F0}>, <a_{F1}>, <a_{F2}>, <b_{F1}>, <b_{F2}>**

5.6.13.4.4. Cascaded filters - #BIQUADOUT

#BIQUADOUT - Downlink Path Biquad Filters	
AT#BIQUADOUT= **<a_{F0}>** [,**<a_{F1}>** [,**<a_{F2}>** [,**<b_{F1}>** [,**<b_{F2}>** [,**<a_{S0}>** [,**<a_{S1}>** [,**<a_{S2}>** [,**<b_{S1}>** [,**<b_{S2}>**]]]]]]]]]]	Set command allows to configure the parameters of the two cascaded digital **biquad filters** $H_{First}(z) \cdot H_{Second}(z)$ in Downlink path (receiving). It is not allowed if active audio profile is 0. Parameters: **<a_{Fn}>,<b_{Fn}>,<a_{Sn}>,<b_{Sn}>** - they all are specific parameters for the calculation of digital **biquad filters** as follows: $$H_F(z) = \frac{a_{F0} + a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ $$H_S(z) = \frac{a_{S0} + a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ 0.. FFFFFFFF - each value has to be interpreted as signed fixed point number in two's complement format with 31 fractional bits in a 32 bit word (Q31) Note: Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.
AT#BIQUADOUT?	Read command returns the parameters for the active profile in the format: **# BIQUADOUT: <a_{F0}>,<a_{F1}>,<a_{F2}>,<b_{F1}>,<b_{F2}>,<a_{S0}>,<a_{S1}>,<_{S2}>,<b_{S1}>,<b_{S2}>** It is not allowed if active audio profile is 0.
AT#BIQUADOUT=?	Test command returns the supported range of values for parameters **<a_{F0}>, <a_{F1}>, <a_{F2}>, <b_{F1}>, <b_{F2}>, <a_{S0}>, <a_{S1}>, <a_{S2}>, <b_{S1}>, <b_{S2}>**

5.6.13.4.5. *Extended Downlink Biquad Filters – #BIQUADOUTEX*

#BIQUADOUTEX – Extended Downlink Biquad Filters	
AT#BIQUADOUTEX= **<a_{F0}>** [,**<a_{F1}>** [,**<a_{F2}>** [,**<b_{F1}>** [,**<b_{F2}>** [,**<a_{S0}>** [,**<a_{S1}>** [,**<a_{S2}>** [,**<b_{S1}>** [,**<b_{S2}>**]]]]]]]]]]	Set command allows to configure the parameters of the two extended digital **biquad filters** $H_{First}(z) \cdot H_{Second}(z)$ in Downlink path (receiving). It is not allowed if active audio profile is 0. Parameters: **<a_{Fn}>,<b_{Fn}>,<a_{Sn}>,<b_{Sn}>** - they all are specific parameters for the calculation of digital **biquad filters** as follows: $$H_F(z) = \frac{a_{F0} + a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$

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

$$H_S(z) = \frac{a_{S0} + a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$

0.. FFFFFFFF - each value has to be interpreted as signed fixed point number in two's complement format with 31 fractional bits in a 32 bit word (Q31)

Note:
Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.
</td></tr>
</table>

AT#BIQUADOUTEX?	Read command returns the parameters for the active profile in the format: **#BIQUADOUTEX:** **<a_{F0}>,<a_{F1}>,<a_{F2}>,<b_{F1}>,<b_{F2}>,<a_{S0}>,<a_{S1}>,<a_{S2}>,<b_{S1}>,<b_{S2}>** Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.
AT#BIQUADOUTEX=?	Test command returns the supported range of values for parameters **<a_{F0}>**, **<a_{F1}>**, **<a_{F2}>**, **<b_{F1}>**, **<b_{F2}>**, **<a_{S0}>**, **<a_{S1}>**, **<a_{S2}>**, **<b_{S1}>**, **<b_{S2}>**

5.6.13.4.6.   Second Extended Downlink Biquad Filters - #BIQUADOUTEXS

#BIQUADOUTEXS – Second Extended Downlink Biquad Filters	
AT#BIQUADOUTEXS= <a_{F0}> [,<a_{F1}> [,<a_{F2}> [,<b_{F1}> [,<b_{F2}>]]]]]	Set command allows to configure the parameters of the two extended digital **biquad filters** $H_{First}(z)$ in Downlink path (receiving). It is not allowed if active audio profile is 0. Parameters: **<a_{Fn}>,<b_{Fn}>** - they all are specific parameters for the calculation of digital **biquad filters** as follows: $$H_F(z) = \frac{a_{F0} + a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ 0.. FFFFFFFF - each value has to be interpreted as signed fixed point number in two's complement format with 31 fractional bits in a 32 bit word (Q31) Note: Parameters can be saved in NVM using AT#PSAV command and are available for audio profiles 1,2,3. For audio profile 0 the values are fixed.
AT#BIQUADOUTEXS?	Read command returns the parameters for the active profile in the format:

	#BIQUADOUTEXS: <a$_{F0}$>,<a$_{F1}$>,<a$_{F2}$>,<b$_{F1}$>,<b$_{F2}$> Note: It is not allowed if active audio profile is 0; in this case an ERROR is returned.
AT#BIQUADOUTEXS=?	Test command returns the supported range of values for parameters **<a$_{F0}$>**, **<a$_{F1}$>**, **<a$_{F2}$>**, **<b$_{F1}$>**, **<b$_{F2}$>**

5.6.13.5. Echo canceller configuration

5.6.13.5.1. *Handsfree Echo Canceller - #SHFEC*

#SHFEC - Handsfree Echo Canceller	

AT#SHFEC= <mode>	Set command enables/disables the echo canceller and noise suppressor on audio handsfree output.
	
	Parameter:
	<mode>
	  0 - disables echo canceller for handsfree mode (EUx factory default)
	  1 - enables echo canceller for handsfree mode (NAx factory default)
	
	Note: This setting returns to default after power off.

AT#SHFEC?	Read command reports whether the echo canceller function on audio handsfree output is currently enabled or not, in the format: **#SHFEC: <mode>**
AT#SHFEC=?	Test command returns the supported range of values of parameter **<mode>**.

5.6.13.5.2. *Handset Echo Canceller - #SHSEC*

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

5.6.13.5.3. Handset Automatic Gain Control - #SHSAGC

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

5.6.13.5.4. Handsfree Automatic Gain Control - #SHFAGC

#SHFAGC - Handsfree Automatic Gain Control	
AT# SHFAGC = <mode>	It has no effect and is included only for backward compatibility. Parameter: **<mode>** (0,1) - (0 is default) *Note: This parameter is saved in NVM issuing AT&W command.*
AT# SHFAGC?	Read command reports whether the automatic gain control function on audio handsfree input is currently enabled or not, in the format: **#SHFAGC: <mode>**
AT# SHFAGC =?	Test command returns the supported range of values of parameter **<mode>**.

5.6.13.5.5. Handsfree RX AGC Value tuning - Handsfree Noise Reduction - #SHFNR

# SHFNR - Handsfree Noise Reduction	
AT#SHFNR = <mode>	It has no effect and is included only for backward compatibility. Parameter: **<mode>** (0,1) - (0 is default) *Note: This parameter is saved in NVM issuing AT&W command.*
AT#SHFNR?	Read command reports whether the noise reduction function on audio handsfree input is currently enabled or not, in the format:

# SHFNR - Handsfree Noise Reduction	
	#SHFNR: <mode>
AT#SHFNR =?	Test command returns the supported range of values of parameter <mode>.

5.6.13.5.6.   Handset Noise Reduction - #SHSNR

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

5.6.13.6.   DTMF

#DTMF – Embedded DTMF decoder enabling	SELINT 2
AT#DTMF=<mode>	Set command enables/disables the embedded DTMF decoder. Parameters: **<mode>:** 0 – disable DTMF decoder (default) 1 – enables DTMF decoder 2 – enables DTMF decoder without URC notify Note: if **<mode>**=1, the receiving of a DTMF tone is pointed out with an unsolicited message through AT interface in the following format: #DTMFEV: x with x as the DTMF digit Note: the duration of a tone should be not less than 50ms. Note: the value set by command is not saved and a software or hardware reset restores the default value. The value can be stored in NVM using profiles. Note: When DTMF decoder is enabled, PCM playing and recording are automatically disabled (AT#SPCM will return error).

AT#DTMF?	Read command reports the currently selected **<mode>** in the format: **#DTMF: <mode>**
AT#DTMF =?	Test command reports supported range of values for all parameters.

5.6.13.7.   DVI

5.6.13.7.1.   Digital Voiceband Interface - #DVI

#DVI - Digital Voiceband Interface	

**AT#DVI=<mode>
[,<dviport>,
<clockmode>]**
	Set command enables/disables the Digital Voiceband Interface.
	
	Parameters:
	<mode> - enables/disables the DVI.
	  0 - disable DVI (factory default)
	  1 - enable DVI; audio is forwarded to the DVI block
	  2 - reserved
	
	<dviport>
	  2 - DVI port 2 will be used
	
	<clockmode>
	  0 - DVI slave
	  1 - DVI master (factory default)
	
	Note: DVI slave is not supported.
	Note: **#DVI** parameters are saved in the extended profile

AT#DVI?	Read command reports last setting, in the format: **#DVI: <mode>,<dviport>,<clockmode>**
AT#DVI=?	Test command reports the range of supported values for parameters **<mode>,<dviport>** and **<clockmode>**
Example	AT#DVI=1,2,1 OK *DVI activated for audio. DVI is configured as master providing on DVI Port #2*

5.6.13.7.2.   Digital Voiceband Interface Configuration - #DVICFG

#DVICFG – DVI CONFIGURATION	
AT#DVICFG=[<clock>[,<decoder pad>[,<decoder format>[, <encoder pad>[,<encoder format>]]]]]	Set command sets the DVI configuration Parameter: **<clock>**: Clock speed for master mode 0 : normal mode

#DVICFG – DVI CONFIGURATION	

	1 : high speed mode(factory default)
	<decoder pad>: PCM padding enable in decoder path
	    0 : disable
	    1 : enable(factory default)
	<decoder format>: PCM format in decoder path
	    0 : u-Law
	    1 : A-Law
	    2 : linear(factory default)
	<encoder pad>: PCM padding enable in encoder path
	    0 : disable
	    1 : enable(factory default)
	<encoder format>: PCM format in encoder path
	    0 : u-Law
	    1 : A-Law
	    2 : linear(factory default)
	
	Note: normal mode is not supported and is included only for backward compatibility.
	
	Note: #DVICFG parameters are saved in the extended profile

AT#DVICFG=?	Test command returns the supported range of values of parameter **<clock>**, **<decoder pad>,<decoder format>,<encoder pad>,<encoder format>**.

5.6.13.8.   Miscellaneous audio commands

5.6.13.8.1.   *PCM Play and Receive - #SPCM*

#SPCM - PCM Play And Receive	SELINT 2

AT#SPCM=<mode>[, dir,[format]]	Execution command allows user either to send speech sample coming from microphone and/or downlink audio channel to serial port, or to reproduce a PCM coming from serial port to speaker and/or uplink audio channel; both modes are also available during speech calls.
	
	Parameters:
	<mode>: action to be execute;
	  1 - reproduce PCM stream from serial to selected path.
	  2 - send speech from selected path to serial.
	
	<dir>: Select the audio path.
	  0 - send/receive to/from analog front end
	  1 - send/receive to/from audio channel
	  2 - reserved
	
	< format >: PCM bits format
	  0 - 8 bit

	1 - 16 bit Note: 0 in <format> has no effect and is included only for backward compatibility and it works well with Linear format of DVI configuration. Note: Execution command switches module in online mode. Module moves back to command mode either after entering the escape sequence +++ or as a consequence of a **DTR transition**. Note: It's not allowed for TE to use two or more serial ports as DATA service(DUN and spcm) simultaneously. **Note: it is mandatory to set +IPR at least to 230400.** The following table summarizes the status of audio path during a speech call for different configurations and with sidetone disabled:

	mode = 1	**mode = 2**
dir = 0	Uplink off / Downlink on PCM stream on speaker	Uplink off / Downlink off PCM stream from microphone
dir = 1	Uplink on / Downlink off PCM stream on Uplink	Uplink off / Downlink on PCM stream from Downlink

Sidetone is active for default.

AT#SPCM=?	Test command returns the supported range of values for parameters **<mode>, <dir>** and **<format>**. **#SPCM: <mode>,<dir>,<format>**
Example	AT#SPCM=1,0,0 CONNECT +++ NO CARRIER Note: after the CONNECT, 8Khz 8bit PCM stream has to be sent to serial port AT#SPCM=2,0,0 CONNECT +++ NO CARRIER Note: after the CONNECT, 8Khz 8bit PCM stream can be read from serial port

5.6.13.8.2. TeleType Writer – #TTY

#TTY - TeleType Writer	
AT#TTY=<support>	Set command enables/disables the TTY functionality. Parameter: **<support>** 0 - disable TTY functionality 1 - enable TTY functionality
AT#TTY?	Read command returns whether the TTY functionalityis currently enabled or not, in the format: **#TTY: <support>**
AT#TTY=?	Test command reports the supported range of values for parameter **<support>**.

5.6.14.   Audio File Management and Play

5.6.14.1.   Audio available size - #ASIZE

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

5.6.14.2.   List audio file - #ALIST

#ALIST – List audio file	
AT#ALIST	This command lists all audio files stored on the modem. The response format is: #ALIST: <filename>,<filesize>,<crc>**<CR><LF>** Parameter: **<filename>** - file name, string type <**filesize**> - file size in bytes <**crc**> - CRC16 poly (x^16+x^12+x^5+1) of file in hex format Note: CRC16 is calculated using the standard CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation) with initial value FFFF. Note: if one file currently stored in efs is in use, then CRC16 cannot be calculated and execution command does not report <crc> for that file. Note: CRC calculation time depends on file size. If one filesize is large,

#ALIST – List audio file	
	Return-time spends a little more time.
AT#ALIST=?	Test command returns the OK result code

5.6.14.3.   Delete audio file - #ADELF

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

5.6.14.4.   Delete all audio files - #ADELA

#ADELA – Delete all audio files	
AT#ADELA	This command deletes all audio files stored on the modem.
AT#ADELA=?	Test command returns the OK result code

5.6.14.5.   Send an audio file - #ASEND

#ASEND – Send an audio file	
AT#ASEND= <filename>,<filesize>	This command allows user to send an audio file to serial port and store it in the modem Parameters: <filename> - file name, string type <filesize> - file size in bytes The URC format is: **#ASENDEV: <result>** Where: **<result>** 0 – pcm storing done 1 – pcm storing error Note: in case Storing is completed or an error occurs, URC is received. Note: filename has a maximum of 32 characters. Note: The total size of all audio files must not be over <total size> in #ASIZE Note: The file should be sent using RAW ASCII file transfer. the flow control is set to hardware and baudrate is set to 115200 bps in the UART port settings.

#ASEND – Send an audio file	
	Note: it's not allowed for TE to use two or more serial ports as DATA service(DUN and asend) simultaneously.
AT#ASEND=?	Test command returns the OK result code
Example	AT#ASEND=<filename>,<filesize> CONNECT

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

5.6.14.6. Receive an audio file - #ARECV

#ARECV – Receive an audio file	
AT#ARECV=<filename>	This command allows user to receive an audio file stored in the modem.

Parameters:

<filename> - file name, string type

Note: The file should be sent using RAW ASCII file transfer. the flow control is set to hardware and baudrate is set to 115200 bps in the UART port settings.
Note: it's not allowed for TE to use two or more serial ports as DATA service(DUN and arecv) simultaneously. |
| AT#ARECV=? | Test command returns the OK result code |
| Example | AT#ARECV=<filename> CONNECT

Note: after the CONNECT, an audio file has to be received from serial port |

5.6.14.7. Record an audio file - #ARECD

#ARECD – Record an audio file	
AT#ARECD= <mode>[,<filename>]	This command records speech data coming from microphone in the modem

Parameter:
<mode>
0 - stop to record(default value)
1 - start to record

<filename> - file name, string type

The URC format is:

#ARECDEV: <result>

Where: |

#ARECD – Record an audio file	
	<result> 0 – pcm record done 1 – pcm record error Note: filename parameter is ignored in case <mode> is 0. Note: in case recording stops because memory is full or an error occurs, URC is received. Note: filename has a maximum of 32 characters. Note: The total size of all audio files must not be over <total size> in #ASIZE
AT#ARECD?	Read command reports the currently selected **<mode>** in the format: **#ARECD: <mode>**
AT#ARECD=?	Test command reports the supported range of values for the parameters <mode> in the format:

5.6.14.8.   Play an audio file - #APLAY

#APLAY – Play an audio file	
AT#APLAY= <mode>[,<dir>,<filename>]	This command plays PCM audio file on the speaker or uplink path. Parameters: <mode> 0 - stop to play, Optional parameters are ignored (default value) 1 - start to play, Optional parameters are mandatory <dir>: select audio path. 0 - send to the speaker(default value) 1 - send to the uplink path <filename> - file name, string type The URC format is: **#APLAYEV: <result>** Where: **<result>** 0 – pcm play done 1 – pcm play error Note: if trying to connect or disconnect eCall during playing, playing stops and URC is received. Note: if file playing is completed or an error occurs, URC is received. Note: When GSM and UMTS Audio Codec is FAWB or UAWB, APLAY is

#APLAY – Play an audio file	
	not supported. Note: This works well with Linear format of DVI configuration.
AT#APLAY?	Read command reports the currently selected **<mode>,<dir>** in the format: **#APLAY: <mode>,<dir>**
AT#APLAY=?	Test command reports the supported range of values for the parameters <mode>,<dir> in the format:

5.6.14.9.   Configure audio file format - #ACONF

#ACONF – Configure audio file format	
AT#ACONF=<format>	This command configures the format of PCM file which is used when recording and playing audio file. Parameters: <format> 0 - Linear(default) 1 - A-law 2 - U-law Note: 8K samples/sec and mono are supported.
AT#ACONF?	Read command reports the currently selected **<format>** in the format: **#ACONF: <format>**
AT#ACONF=?	Test command reports the supported range of values for the parameters <format> in the format.

5.6.15.   Emergency call and eCall Management

5.6.15.1.   Dial an emergency call - #EMRGD

#EMRGD – dial an emergency call	
AT#EMRGD[=<par>]	This command initiates an emergency call. Parameters: <par>: 0 – initiates an emergency call without specifying the Service Category. (default value) 1..31 – sum of integers each representing a specific Emergency Service Category: 1 – Police

#EMRGD – dial an emergency call	

	2 – Ambulance
	4 – Fire Brigade
	8 – Marine Guard
	16 – Mountain Rescue
	32 – Manually Initiated eCall
	64 – Automatically Initiated eCall
	
	When the emergency call can initiate, an indication of the Service Category selected is shown before the OK in the following format:
	
	#EMRGD: <serv>[,<serv>..[,<serv>]]
	
	Where
	
	<serv>
	   "Police"
	   "Ambul"
	   "FireBrig"
	   "MarineGuard"
	   "MountRescue"
	   "MIeC"
	   "AIeC"
	
	Example:
	
	AT#EMRGD=17
	#EMRGD: "Police","MountRescue"
	
	OK

AT#EMRGD	The execution command initiates an emergency call without specifying the Service Category.

AT#EMRGD?	The read command reports the emergency numbers received from the network (Rel5 feature) and the associated service categories in the format:
	[#EMRGD:<num1>[,<par1>,<serv>[,<serv>..[,<serv>]]]
	[#EMRGD:<num*n*>[,<par*n*>,<serv>[,<serv>..[,<serv>]]]
	
	Where
	
	<num*n*>
	Is the emergency number (that can be dialled with ATD command).
	
	<par*n*>
	 1..31 – sum of integers each representing a specific Emergency Service Category:
	   1 – Police
	   2 – Ambulance

#EMRGD – dial an emergency call	
	4 – Fire Brigade 8 – Marine Guard 16 – Mountain Rescue 32 – Manually Initiated eCall 64 – Automatically Initiated eCall Example: **AT#EMRGD?** **#EMRGD: 123,2,"Ambul"** **#EMRGD: 910,5, "Police","FireBrig"** **OK**
AT#EMRGD=?	Test command reports the supported range of values for parameter **\<par\>**.

5.6.15.2.   IVS Push mode activation - #MSDPUSH

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

5.6.15.3.   Sending MSD data to IVS - #MSDSEND

#MSDSEND – Sending MSD data to IVS	
AT#MSDSEND	Execution command allows to send 140 bytes of MSD data to the IVS embedded while modem is in command mode. The device responds to the command with the prompt '>' and waits for the MSD to send. To complete the operation send **Ctrl-Z** char (**0x12A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). If data are successfully sent, then the response is OK If data sending fails for some reason, an error code is reported. Note: the maximum number of bytes to send is 140; trying to send more data will cause the surplus to be discarded and lost.
AT#MSDSEND=?	Test command returns the **OK** result code

5.6.15.4.   Network Emergency Number Update - #NWEN

#NWEN - Network Emergency Number Update	

AT#NWEN=[<en>]	Set command enables/disables URC of emergency number update.
	
	Parameters:
	<en>
	  0 - disables URC of emergency number update (factory default)
	  1 - enables URC of emergency number update
	
	  #NWEN: <type>
	where:
	<type>
	  1 – number list update from internal ME
	  2 – number list update from SIM
	  3 – number list update from network
	
	  Note: **<en>** is saved in NVM.

AT#NWEN?	Read command reports whether URC of network emergency number update is currently enabled or not: **#NWEN: <en>**
AT#NWEN=?	Test command returns supported values of parameter **<en>**

5.6.15.5.   Initiate eCall - +CECALL

+CECALL - Initiate eCall	

AT+CECALL=<type of eCall>	Set command is used to trigger an eCall to the network. Based on the configuration selected, it can be used to either trigger a test call, a reconfiguration call, a manually initiated call or an automatically initiated call.
	
	Parameters:
	<type of eCall>
	  0 – test call
	  1 – reconfiguration call
	  2 – manually initiated eCall
	  3 – automatically initiated ecall

AT+CECALL ?	Read command returns the type of eCall that is currently in progress in the format: **+CECALL: <type of eCall>**
AT+CECALL =?	Test command reports the supported range of values for parameter **<type of eCall>**

5.6.15.6.   Embedded IVS inband modem enabling - #ECALL

#ECALL – Embedded IVS inband modem enabling	
AT#ECALL=<mode>	Set command enables/disables the embedded IVS modem.

#ECALL – Embedded IVS inband modem enabling	
	Parameters: <mode>: 0 – disable IVS (default) 1 – enables IVS Note: the sending of a MSD is pointed out with an unsolicited message through AT interface that can report the HL-ACK data bits or an error code in the following format: #ECALLEV: <prim>,<data> <prim>: 0 – Pull-IND 1 – Data_CNF 2 – AL-Ack 16 – sync loss <data>: Data content of Application Layer message (only with AL-Ack) Note: the value set by command is not saved and a software or hardware reset restores the default value. The value can be stored in NVM using profiles. Note: When IVS modem is enabled PCM playing, PCM recording and DTMF decoding are automatically disabled (AT#SPCM or AT#DTMF will return error). Note: +CECALL command supersedes this command because it enables automatically eCall functionality.
AT#ECALL?	Read command reports the currently selected <prim> in the format: #ECALL: <mode> <mode>: 0 – IVS disabled 1 – IVS enabled
AT#ECALL =?	Test command reports supported range of values for all parameters.+-

5.6.15.7.   Determine Encoding Rule - #ECALLTYPE

#ECALLTYPE – Determine encoding rule	
AT#ECALLTYPE= <rule>	Set method to encode MSD data Parameters: <rule>:

#ECALLTYPE – Determine encoding rule	
	0 – Qaulcomm encoding rule. 1 – Unified AT command rule(Default). 2 – ASN.1 Packed encoding rule (PER unaligned). Note: the main difference of **\<rule\>** is which rule make codified MSD. if **\<rule\>** is set to 1, need to set codified MSD via **#MSDSEND** command before sending MSD to PSAP. if set to 0 or 2, need to set the parameters of MSD via **#MSDVI** and **#MSDGI** commands before sending MSD to PSAP. Note: when **\<rule\>** set to 0, data present of MSD is encoded with Qualcomm own method Note: when **\<rule\>** set to 1, MSD data uses data received to **#MSDSEND** Note: the below table indicate to applicable AT command following each selected value of **\< rule \>** AT Command | #ECALLTYPE=1 | # ECALLTYPE =0 or 2 +CECALL | O | O #TESTNUM | O | O #MSDSEND | O | X #MSDPUSH | O | X #MSDVI | X | O #MSDGI | X | O Note: #ECALLTYPE=0,2 isn't possible to redo a PUSH by the application. Note: The setting is saved in NVM and available on following reboot.
AT#ECALLTYPE?	Read command reports the current values of parameter < rule >
AT#ECALLTYPE =?	Test command reports the supported range of values for parameter \<rule\>

5.6.15.8.   MSD of Vehicle Information - #MSDVI

#MSDVI – MSD of Vehicle Information	
AT#MSDVI =\<type\>, \<VIN\>, \<storage type\>, [\<Nb of passengers\>]	This command sets the contents of MSD which is related vehicle information stored on EF system. Parameters: **\<type\>-** indicates the type of vehicle 1 – passenger vehicle (class M1) 2 – buses and coaches (class M2) 3 – buses and coaches (class M3) 4 – light commercial vehicles (class N1) 5 – heavy duty vehicles (class N2) 6 – heavy duty vehicles (class N3) 7 – motorcycles (class L1e) 9 – motorcycles (class L1e)

#MSDVI – MSD of Vehicle Information	
	10 – motorcycles (class L1e) 11 – motorcycles (class L1e) 12 – motorcycles (class L1e) 13 – motorcycles (class L1e) **<VIN>-** string type; vehicle Identification number according to ISO 3779 **<storage type>-** sum of integer each representing the vehicle propulsion storage type 1 – gasoline tank 2 – diesel tank 4 – compressed natural gas (CNG) 8 – liquid propane gas (LPG) 16 – electric energy storage (with more than 42V and 100Ah) 32 – hydrogen storage **<Nb of passenger>-** Minimum known number of fastened seatbelts 0..254 – number of passenger 255 – no information available Note: **#MSDVI** is applicable only if the current selected eCall mode (see **#ECALLTYPE**) is set to 0 or 2 Note: The setting is saved in NVM .
AT#MSDVI?	Read command reports the values of vehicle information which is stored on NVM in the format: **#MSDVI: <type>,<VIN>,<storage type>,<Nb of passengers>**
AT# MSDVI=?	Test command returns the allowed values for parameters

5.6.15.9.   MSD of GPS Information and Vehicle - #MSDGI

#MSDGI – MSD of GPS and Vehicle Information	
AT#MSDGI =<GPS mode>,<message identifier>,<confidence> ,<passengers> ,<time stamp>,<current latitude>,<current longitude>,<current direction>[,<recent latitude n-1>,<recent longitude n-1>[,<recent latitude n-2>,<recent longitude n-2>]]	This command sets the contents of MSD which is related vehicle incident information such as GPS information, number of passenger and so on, stored on EF system. Parameters: **<GPS mode >-** GPS mode number of fastened seatbelts 0 – use embedded GPS data (Not Support) 1 – use external GPS data which is stored on EF system **<message identifier> -** Message identifier, starting with 1 for each new eCall session and to be incremented with every application layer MSD retransmission following a new 'Send MSD' request after the incident event Range is 1..255

#MSDGI – MSD of GPS and Vehicle Information	
	<confidence> - The position confidence should be set to "Low confidence in position" if the positlon is not within the limits of ± 150 m with 95 % confidence. 0 – low confidence in position 1 – Position can be trusted

<passengers>- Minimum known number of fastened seatbelts 0..254 – number of passenger 255 – no information available

Note: followed parameters **<time stamp>**, **<current latitude>**, **<current longitude>**, **<current direction>**, **<recent latitude n-1>**, **<recent longitude n-1>**, **<recent latitude n-2>** and **<recent longitude n-2>** applicable only for **<GPS mode>** is set to 1 otherwise used internal embedded GPS data.

<time stamp>- integer of timestamp of incident event base on UTC sec. As seconds elapsed since midnight Jan. 1st, 1970 UTC

<current latitude>- position latitude of current vehicle location (WGS84). range is "-324000000 to 324000000"

<current longitude>- position longitude of current vehicle location(WGS84). range is "-648000000 to 648000000"

<current direction>- Direction of travel in 2° degrees steps from magnetic north (0 – 358, clockwise)

<recent latitude n-1>- latitude delta (+ for North and – for South) with respect to **<current latitude>**. range is "-512 to 511"

<recent longitude n-1>- longitude delta (+ for East and – for West) with respect to **<current longitude>**. range is "-512 to 511"

<recent latitude n-2>- latitude delta (+ for North and – for South) with respect to **<recent latitude n-1>**. range is "-512 to 511"

<recent longitude n-2>- longitude delta (+ for East and – for West) with respect to **<recent longitude n-1>**. range is "-512 to 511"

Note: if time stamp is set to "0" it's means failure value of time stamp.

Note: the unit of latitude delta and longitude delta is 1 Unit = 100 milli-arcseconds (WGS84) which is approximately 3m.

Note: **#MSDGI** is applicable only if the current selected eCall mode (see **#ECALLTYPE**) is set to 0 or 2. |

#MSDGI – MSD of GPS and Vehicle Information	
	Note: When use internal GPS, should set a default time stamp and gps position to be used in case of no gps fix.
AT#MSDGI?	Read command reports the values of GPS information which is stored on EF in the format: **# MSDGI: <GPS mode >,<message identifier>,<confidence>,<Nb of passengers>,<time stamp>,<current latitude>,<current longitude>,<current direction>,<recent latitude n-1>,<recent longitude n-1>,<recent latitude n-2>,<recent longitude n-2>**
AT# MSDGI =?	Test command returns the allowed values for parameters

5.6.15.10. Set eCall Only mode - #ECONLY

#ECONLY – set eCall Only mode	
AT#ECONLY=<mode>	This command enables/disables the eCall Only mode of operation. Parameters: **<mode>:** 0 – disable eCall Only mode, normal mode (default) 1 - enable eCall Only mode if eCall only subscription is available 2 – enable eCall Only mode even if eCall only subscription is not available Note: the value set by command is directly stored in NVM. Note: the **<mode>** of "1 - enable eCall Only mode if eCall only subscription is available" is available at the next switch-on.
AT#ECONLY?	Read command reports the currently selected **<mode>** and **<status>** in the format: **#ECONLY: <mode>,<status>** Parameters: **<status>:** 0 – eCall only mode doesn't apply 1 – eCall only mode applies 2 - eCall only mode applies, but T3242 or T3243 are running
AT#ECONLY=?	Test command reports the supported range of values for parameter **<mode>**.

5.6.16.   AT Run Commands

5.6.16.1.   Enable SMS Run AT Service – #SMSATRUN

#SMSATRUN – Enable SMS AT Run service	

AT#SMSATRUN=
<mod>
	Set command enables/disables the SMS AT RUN service.
	
	Parameter:
	< mod >
	     0: Service Disabled
	     1: Service Enabled
	
	Note: the current settings are stored in NVM.

AT#SMSATRUN?	Read command returns the current settings of <mode> and the value of <stat> in the format:
	
	# SMSATRUN: <mod>,<stat>
	
	  where:
	  <stat> - service status
	    0 – not active
	    1 - active

AT#SMSATRUN =?	Test command returns the supported values for the SMSATRUN parameters
Notes:	• By default the SMS ATRUN service is disabled It can be activated either by the command AT#SMSATRUN or receiving a special SMS that can be sent from a Telit server.

5.6.16.2.   Set SMS Run AT Service parameters - #SMSATRUNCFG

#SMSATRUNCFG – Set SMS AT Run Parameters	

AT#SMSATRUNCFG=
<instance>
[,<urcmod>
[,<timeout>]]
	Set command configures the SMS AT RUN service.
	
	Parameter:
	<instance>:
	AT instance that will be used by the service to run the AT Command. Range 1- 3, default 3.
	
	Note: In Qualcomm platform, **<instance>** parameter is not supported and SMS Run AT service has its independent channel. This parameter is dummy for unified policy.
	
	<urcmod>:
	    0 – disable unsolicited message
	    1 - enable an unsolicited message when an AT command is requested via SMS (default).

#SMSATRUNCFG – Set SMS AT Run Parameters	
	When unsolicited is enabled, the AT Command requested via SMS is indicated to TE with unsolicited result code: #SMSATRUN: <Text> e.g.: #SMSATRUN: AT+CGMR;+CGSN;+GSN;+CCLK Unsolicited is dumped on the instance that requested the service activation. **<timeout>:** It defines in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. Range 1 – 60, default 5. Note 1: the current settings are stored in NVM. Note 2: SMS Run AT service and EvMoni service share the same channel. For the unified policy, when the #SMSATRUNCFG sets the <**instance**> parameter, the change is reflected also in the <**instance**> parameter of the #ENAEVMONICFG command, and viceversa. Note 3: the set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUN? returns 1 as <mod> parameter
AT#SMSATRUNCFG?	Read command returns the current settings of parameters in the format: **#SMSATRUNCFG:<instance>,<urcmod>,<timeout>**
AT#SMSATRUNCFG=?	Test command returns the supported values for the SMSATRUNCFG parameters

5.6.16.3.   SMS AT Run White List – #SMSATWL

#SMSATWL – SMS AT Run White List	

AT#SMSATWL=
<action>
,<index>
[,<entryType>
[,<string>]]
	Set command to handle the white list.
	
	<action >:
	      0 – Add an element to the WhiteList
	      1 – Delete an element from the WhiteList
	      2 – Print and element of the WhiteList
	
	< index >: Index of the WhiteList. Range 1-8
	
	< entryType >:
	      0 – Phone Number
	      1 – Password

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

5.6.16.4. Set TCP Run AT Service parameter - #TCPATRUNCFG

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

#TCPATRUNCFG – Set TCP AT Run Service Parameters	

	Range 1..65535. This parameter is mandatory.
	
	<**tcpHost**>
	IP address of the Host, string type.
	This parameter can be either:
	    - Any valid IP address in the format: "xxx.xxx.xxx.xxx"
	    - Any host name to be solved with a DNS query
	This paramteter is mandatory. Default "".
	
	<**urcmod**>
	     0 – disable unsolicited messages
	     1 – enale an unsolicitied message when the TCP socket is connected or disconnect (default).
	
	When unsolicited is enabled, an asynchronous TCP Socket connection is indicated to TE with unsolicited result code:
	
	#TCPATRUN: <iphostaddress>
	
	When unsolicited is enabled, the TCP socket disconnection is indicated to TE with unsolicited result code:
	
	#TCPATRUN: <DISCONNECT>
	
	Unsolicited is dumped on the instance that requested the service activation.
	
	<timeout>
	Define in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. The default value is 5 minutes. Range 1…5.
	
	<autoMode>
	Determines the authentication procedure in server mode:
	    0 – when connection is up, username and password (in this order and each of them followed by a Carriage Return) have to be sent to the module before the first AT command. (default)
	    1 – when connection is up, the user receives a request for username and, if username is correct, a request for password. Then a message of "Login successful" will close authentication phase.
	
	Note: if username and/or password are not allowed (see **AT#TCPATRUNAUTH**) the connection will close immediately.
	
	<retryCnt>
	in client mode, at boot or after a socket disconnection, this parameter represents the number of attempts that are made in order to re-connect to the Host.
	Default: 0. Range 0…5.

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

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

#TCPATRUNL – Enables TCP AT Run Service in listen (server) mode	
AT#TCPATRUNL=<mod>	Set command enables/disables the TCP AT RUN service in server mode. When this service is enabled, the module tries to put itself in TCP listen state. Parameter: **<mod >** 0 – Service Disabled 1 – Service Enabled Note: the current settings are stored in NVM. Note: to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command).

AT#TCPATRUNL?	Read command returns the current settings of <mode> and the value of <stat> in the format:
	
	#TCPATRUNL: <mod>,<stat>
	
	   where:
	   <stat> - connection status
	    0 – not in listen
	    1 – in listen or active

AT#TCPATRUNL=?	Test command returns the supported values for the **TCPATRUNL** parameters

5.6.16.6.　TCP AT Run Firewall List - #TCPATRUNFRWL

#TCPATRUNFRWL – TCP AT Run Firewall List	
AT#TCPATRUNFRWL= <action>, <ip_addr>, <net_mask>	Set command controls the internal firewall settings for the TCPATRUN connection. Parameters: **<action>** Command action 　　　　0 – remove selected chain 　　　　1 – add an **ACCEPT** chain 　　　　2 – remove all chains (**DROP** everything); 　　　　　<ip_addr> and <net_mask> has no meaning in this case. <**ip_addr**> Remote address tp be added into the **ACCEPT** chain; string type, it can be any valid IP address in the format: xxx.xxx.xxx.xxx <**net_mask**> Mask to be applied on the <ip_addr>; String type, it can be any valid IP address mask in the format: xxx.xxx.xxx.xxx Command returns **OK** result code if successful. Firewall general policy is **DROP**, therefore all packets that are not included into an **ACCEPT** chain rule will be silently discarded. When a packet comes from the IP address **incoming_IP**, the firewall chain rules will be scanned for matching with the following criteria: **incoming_IP & <net_mask> = <ip_addr> & <net_mask>** If criteria is matched, then the packet is accepted and the rule scan is finished; if criteria is not matched for any chain the packet is silently dropped. Note: A maximum of 5 firewall can be present at same time in the List. Note: the firewall list is saved in NVM
AT#TCPATRUNFRWL?	Read command reports the list of all ACCEPT chain rules registered in the firewall setting in the format: **#TCPATRUNFRWL: <ip_addr>,<net_mask>** **#TCPATRUNFRWL: <ip_addr>,<net_mask>** **…** **OK**
AT#TCPATRUNFRWL=?	Test command returns the allowed values for parameter <**action**>.

5.6.16.7. TCP AT Run Authentication Parameters List - #TCPATRUNAUTH

#TCPATRUNAUTH – TCP AT Run Authentication Parameters List	

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

AT#TCPATRUNAUTH?	Read command reports the list of all ACCEPT chain rules registered in the firewall setting in the format: **#TCPATRUNAUTH: <userid>,<passw>** **#TCPATRUNAUTH: <userid>,<passw>** **…** **OK**
AT#TCPATRUNAUTH= ?	Test command returns the allowed values for parameter <**action**>.

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

#TCPATRUND – Enable TCP AT Run Service in dial (client) mode	

AT#TCPATRUND=
 <mod>
	Set command enables/disables the TCP AT RUN service in client mode.
	 When this service is enabled, the module tries to open a connection to the Host (the Host is specified in **AT#TCPATRUNCFG**).
	
	 Parameter:
	 < mod >
	       0: Service Disabled
	       1: Service Enabled

#TCPATRUND – Enable TCP AT Run Service in dial (client) mode	
	Note: The current setting are stored in NVM Note: To start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command). Note: If the connection closes or at boot, if service is enabled and context is active, the module will try to reconnect for the number of attempts specified in AT#TCPATRUNCFG also the delay between one attempt and the other will be the one specified in **AT#TCPATRUNCFG**.

AT#TCPATRUND?	Read command returns the current settings of <**mode**> and the value of <**stat**> in the format:
	
	# TCPATRUND: <mod>,<stat>
	
	   where:
	   <stat> - connection status
	    0 – not connected
	    1 – connected or connecting at socket level
	    2 – not connected but still trying to connect, attempting every delay time
	      (specified in **AT#TCPATRUNCFG**)

AT#TCPATRUND =?	Test command returns the supported values for the **TCPATRUND** parameters

5.6.16.9.   Closing TCP Run AT Socket - #TCPATRUNCLOSE

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

5.6.16.10.   TCP AT Run Command Sequence - #TCPATCMDSEQ

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

AT#TCPATCMDSEQ=
<mod>
	Set command enable/dsable, for TCP Run AT service, a feature that allows giving more than one AT command without waiting for responses.
	It does not work with commands that uses the prompt '>' to receive the message body text (e.g. "**AT+CMGS**")
	
	Parameter:
	< mod >
	      0 - Service Disabled (default)
	      1 - Service Enabled

AT#TCPATCMDSEQ?	Read command returns the current settings of parameters in the format: **#TCPATCMDSEQ: <mod>**

#TCPATCMDSEQ – For TCP Run AT Service, allows the user to give AT commands in sequence	
AT#TCPATCMDSEQ=?	Test command returns the supported values for the **TCPATCMDSEQ** parameters.

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

#TCPATCONSER – Connects the TCP Run AT service to a serial port	

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

AT#TCPATCONSER=?	Test command returns the supported values for the **TCPATCONSER** parameters

5.6.16.12.   Run AT command execution - #ATRUNDELAY

#ATRUNDELAY – Set the delay on Run AT command execution	
AT#ATRUNDELAY= <srv>, <delay>	Set command enables the use of a delay before the execution of AT command received by Run AT service (TCP and SMS). It affects just AT commands given through Run AT service. Parameters: **< srv >**

#ATRUNDELAY – Set the delay on Run AT command execution	
	0 – TCP Run AT service 1 – SMS Run AT service <delay> Value of the delay, in seconds. Range 0..30. Default value 0 for both services (TCP and SMS). Note: The use of the delay is recommended to execute some AT commands that require network interaction or switch between GSM and GPRS services. For more details see the RUN AT User Guide. Note: The delay is valid till a new **AT#ATRUNDELAY** is set.
AT#ATRUNDELAY?	Read command returns the current settings of parameters in the format: **#ATRUNDELAY: 0, <delayTCP>** **#ATRUNDELAY: 1, <delaySMS>** **OK**
AT#ATRUNDELAY=?	Test command returns the supported values for the **ATRUNDELAY** parameters

5.6.17.   Event Monitor Commands

5.6.17.1.   Enable EvMoni Service - #ENAEVMONI

#ENAEVMONI – Enable EvMoni Service	
AT#ENAEVMONI= <mod>	Set command enables/disables the EvMoni service. Parameter: **<mod>** 　　　0 – Service Disabled (default) 　　　1 – Service Enabled Note: The current settings are stored in NVM.
AT#ENAEVMONI?	Read command returns the current settings of <mode> and the value of <stat> in the format: **#ENAEVMONI: <mod>,<stat>** 　　where: 　　**<stat>** - service status 　　　0 – not active (default) 　　　1 – active
AT#ENAEVMONI=?	Test command returns the supported values for the **ENAEVMONI** parameters

5.6.17.2.   EvMoni Service parameter - #ENAEVMONICFG

#ENAEVMONICFG – Set EvMoni Service Parameters	

AT#ENAEVMONICFG=
<**instance**>
[,<**urcmod**>
[,<**timeout**>]]
	Set command configures the EvMoni service.
	
	Parameters:
	
	<**instance**>
	AT instance that will be used by the service to run the AT Command.
	Range 1-3. (Default: 3)
	
	Note: In Qualcomm platform, <**instance**> parameter is not supported and EvMoni service share the same channel with SMS Run AT service. This parameter is dummy for unified policy.
	
	<urcmod>
	        0 – disable unsolicited message
	        1 – enable an unsolicited message when an AT command is executed after an event is occurred (default)
	
	When unsolicited is enabled, the AT Command is indicated to TE with unsolicited result code:
	
	#EVMONI: <TEXT>
	
	e.g.:
	#EVMONI: AT+CGMRl+CGSN;+GSN;+CCLK
	
	Unsolicited is dumped on the instance that requested the service activation.
	
	<**timeout**>
	It defines in minutes the maximum time for a command execution. If timeout Expires the module will be rebooted. (Default: 5)
	
	Note: The current settings are stored in NVM.
	
	Note: EvMoni service and SMS Run AT service share the same channel. For the unified policy, when the **#ENAEVMONICFG** sets the <**instance**> parameter, the change is reflected also in the <**instance**> parameter of the **#SMSATRUNCFG** command, and viceversa.
	
	Note: The set command returns ERROR if the command **AT#ENAEVMONI?** Retirms 1 as <**mod**> parameter or the command **AT#SMSATRUN?** Returns 1 as <**mod**> parameter.

AT#ENAEVMONICFG?	Read command returns the current settings of parameters in the format: **#ENAEVMONICFG: <instance>,<urcmode>,<timeout>**
AT#ENAEVMONICFG=?	Test command returns the supported values for the **ENAEVMONICFG** parameters

5.6.17.3. Event Monitoring - #EVMONI

#EVMONI – Set the single Event Monitoring	

AT#EVMONI=
\<label\>
,\<mode\>
[,\<paramType\>
,\<param\>]
	Set command enables/disables the single event monitoring, configures the related parameter and associates the AT command
	
	\<label\>
	String parameter (that has to be enclosed between double quotes) indicating the event under monitoring. It can assume the following values:
	  • VBATT - battery voltage monitoring
	  • DTR - DTR monitoring
	  • ROAM - roaming monitoring
	  • CONTDEACT - context deactivation monitoring
	  • RING - call ringing monitoring
	  • STARTUP – module start-up monitoring
	  • REGISTERED – network registration monitoring
	  • GPIO1 – monitoring on a selected GPIO in the GPIO range
	  • GPIO2 – monitoring on a selected GPIO in the GPIO range
	  • GPIO3 – monitoring on a selected GPIO in the GPIO range
	  • GPIO4 – monitoring on a selected GPIO in the GPIO range
	  • GPIO5 – monitoring on a selected GPIO in the GPIO range
	  • ADCH1 – ADC High Voltage monitoring
	  • ADCL1 – ADC Low Voltage monitoring
	  • DTMF1 – monitoring on user defined DTMF string
	  • DTMF2 – monitoring on user defined DTMF string
	  • DTMF3 – monitoring on user defined DTMF string
	  • DTMF4 – monitoring on user defined DTMF string
	  • SMSIN – monitoring on incoming SMS
	
	\<mode\>
	        0 – disable the single event monitoring (default)
	        1 – enable the single event monitoring
	
	\< paramType \>
	Numeric parameter indicating the type of parameter contained in **\<param\>**. The 0 value indicates that **\<param\>** contains the AT command string to execute when the related event has occurred. Other values depend from the type of event.
	
	\<param\>
	It can be a numeric or string value depending on the value of **\<paramType\>** and on the type of event.
	If **\<paramType\>** is 0, then **\<param\>** is a string containing the AT command:
	
	  • It has to be enclosed between double quotes
	  • It has to start with the 2 chars AT (or at)

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

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

5.6.17.4.   Send Message - #CMGS

#CMGS - Send Message	
(PDU Mode) **AT#CMGS=** **<length>,<pdu>**	**(PDU Mode)** Execution command sends to the network a message. Parameter: **<length>** - length of the PDU to be sent in bytes (excluding the SMSC address octets). 7..164 **<pdu>** - PDU in hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line. Note: when the length octet of the SMSC address (given in the **<pdu>**) equals zero, the SMSC address set with command +**CSCA** is used; in this case the SMSC Type-of-Address octet shall not be present in the **<pdu>**. If message is successfully sent to the network, then the result is sent in the format: **#CMGS: <mr>** where **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format. Note: if message sending fails for some reason, an error code is reported.
(Text Mode) **AT#CMGS=<da>** **,<text>**	**(Text Mode)** Execution command sends to the network a message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see +**CSCS**). **<text>** - text to send The entered text should be enclosed between double quotes and formatted as follows: - if current **<dcs>** (see +**CSMP**) indicates that GSM03.38 default alphabet is used and current **<fo>** (see +**CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. - if current **<dcs>** (see +**CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see +**CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this

#CMGS - Send Message	
	will be converted to an octet with integer value **0x2A**)
	If message is successfully sent to the network, then the result is sent in the format:
	#CMGS: <mr>
	where
	<mr> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.
	Note: if message sending fails for some reason, an error code is reported.
AT#CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **#CMGS: <mr>** or **#CMS ERROR: <err>** response before issuing further commands.
Reference	GSM 27.005

5.6.17.5.   Write Message To Memory - #CMGW

#CMGW - Write Message To Memory	
(PDU Mode) **AT#CMGW=<length>,<pdu>**	**(PDU Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameter: **<length>** - length in bytes of the PDU to be written. 7..164 **<pdu>** - PDU in hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line. If message is successfully written in the memory, then the result is sent in the format: **#CMGW: <index>** where: **<index>** - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported.
(Text Mode) **AT#CMGW=<da>,<text>**	**(Text Mode)** Execution command writes in the **<memw>** memory storage a new message. Parameters: **<da>** - destination address, string type represented in the currently selected character set (see **+CSCS**). **<text>** - text to write

#CMGW - Write Message To Memory	
	The entered text should be enclosed between double quotes and formatted as follows: - if current **<dcs>** (see **+CSMP**) indicates that GSM03.38 default alphabet is used and current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to GSM 27.005, Annex A. - if current **<dcs>** (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) If message is successfully written in the memory, then the result is sent in the format: **#CMGW: <index>** where: **<index>** - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported.
AT#CMGW=?	Test command returns the **OK** result code.
Reference	GSM 27.005
Note	To avoid malfunctions is suggested to wait for the **#CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

6.   AT parser abort

The following AT Command list can be aborted, while executing the AT Command
ATD
ATA
+CLCK
+CLCC
+COPN
+CPOL
+CLIP
+CLIR
+COPS(Accept only test command)
NOTE: If DTE transmit any character before receiving the response to the issued AT
Command, this make current AT Command to be aborted.

7.　　List of acronyms

ARFCN	Absolute Radio Frequency Channel Number
AT	Attention command
BA	BCCH Allocation
BCCH	Broadcast Control Channel
CA	Cell Allocation
CBM	Cell Broadcast Message
CBS	Cell Broadcast Service
CCM	Current Call Meter
CLIR	Calling Line Identification Restriction
CTS	Clear To Send
CUG	Closed User Group
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DCS	Digital Cellular System
DNS	Domain Name System Server
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Fraquency
DTR	Data Terminal Ready
GPRS	Global Packet Radio Service
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IRA	International Reference Alphabet
IWF	Interworking Function
MO	Mobile Originated
MT	Mobile Terminal
NVM	Non Volatile Memory
PCS	Personal Communication Service
PDP	Packet Data Protocol
PDU	Packet Data Unit
PIN	Personal Identification Number
PPP	Point to Point Protocol
PUK	Pin Unblocking Code
RLP	Radio Link Protocol
RMC	Recommended minimum Specific data
RTS	Request To Send
SAP	SIM Access Profile
SCA	Service Center Address
SMS	Short Message Service

SMSC	Short Message Service Center
SMTP	Simple Mail Transport Protocol
TA	Terminal Adapter
TCP	Transmission Control Protocol
TE	Terminal Equipment
UDP	User Datagram Protocol
USSD	Unstructured Supplementary Service Data
UTC	Coordinated Universal Time
VDOP	Vertical dilution of precision
VTG	Course over ground and ground speed

8.   Document History

Revision	Date	Changes
0	2012-06-04	Initial release
1	2013-10-16	SW version 19.10.xx1
2	2014-07-28	SW version 19.10.xx2