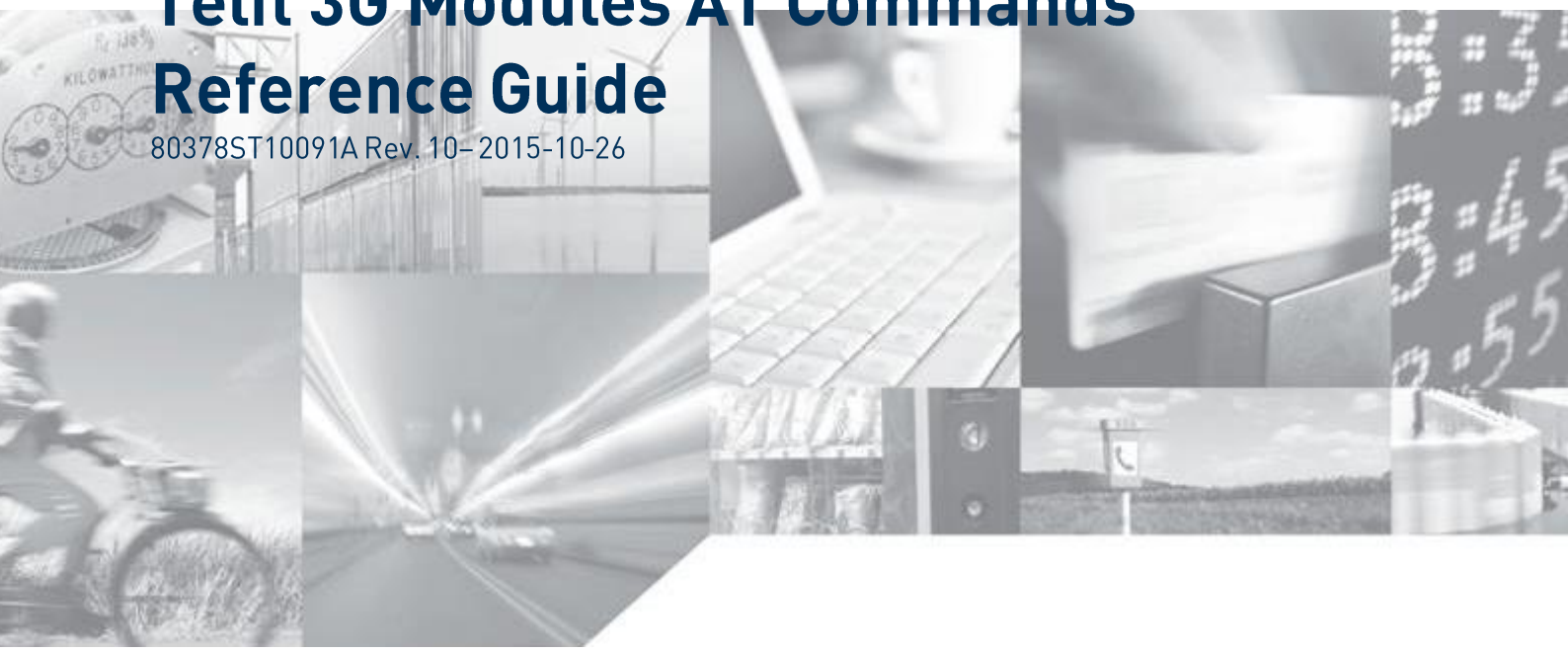
Telit 3G Modules AT Commands Reference Guide

80378ST10091A Rev. 10– 2015-10-26



Making machines talk.

APPLICABILITY TABLE[1]

PRODUCT
HE910
HE910-D
HE910-GL
HE910-EUR
HE910-EUD
HE910-EUG
HE910-NAR
HE910-NAD
HE910-NAG
UE910-EUR
UE910-EUD
UE910-NAR
UE910-NAD
UL865-EUR
UL865-EUD
UL865-NAR
UL865-NAD
UE866-N3G
UE910-N3G

SW Version
12.00.xx7

Note: the features described by the present document are provided by the products equipped with the software versions equal or greater than the version shown in the table.

[1] HE910 is the "type name" of the products marketed as HE910-G and HE910-DG

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1. Introduction

1.1. Scope

This document is aimed in providing an 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 Technical Support Center (TTSC) at:

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

Alternatively, use:
http://www.telit.com/en/products/technical-support-center/contact.php
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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" AT Commands Basic Definitions

Chapter 4: "AT Commands Availability Table" Differences between the products variants

Chapter 5: "AT Commands References" The core of this specification

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

- 3GPP TS 27.007 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/
- 3GPP TS 27.005 specification and rules
  http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/
- Hayes standard AT command set

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2. Overview

2.1. About the document

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

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3. AT COMMANDS

The Telit wireless module family can be controlled via the serial interface using the standard AT commands[2]. The Telit wireless module family is compliant with:

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. 3GPP TS 27.007 specific AT command and GPRS specific commands.
3. 3GPP TS 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)

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

3.1. Definitions

The following syntactical definitions apply:

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

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

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

[...] Optional subparameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in AT commands which have a Read command, new value equals to its previous value. In AT commands which do not store the values of any of their subparameters, 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 subparameter.

[2] 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.combined with other parameters can be set up in the communications package or typed in manually as a command line instruction.

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3.2. AT Command Syntax

The syntax rules followed by Telit implementation of either Hayes AT commands, GSM 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 subparameters; they also have a Read command (trailing **?**) to check the current values of subparameters.

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

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

- "tested" to determine:

if subparameters are associated with the action, the ranges of subparameters values that are supported; if the command has no subparameters, issuing the correspondent Test command (trailing **=?**) raises the result code "**ERROR**".
Note: issuing the Read command (trailing **?**) causes the command to be executed.

whether or not the equipment implements the Action Command (in this case issuing the correspondent Test command - trailing **=?** - returns the **OK** result code), and, if subparameters are associated with the action, the ranges of subparameters values that are supported.

Action commands don't store the values of any of their possible subparameters.

Moreover:

The response to the Test Command (trailing **=?**) may be changed in the future by Telit to allow the description of new values/functionalities.

If all the subparameters of a parameter type command **+CMD** are optional, issuing **AT+CMD=<CR>** causes the **OK** result code to be returned and the previous values of the omitted subparameters to beretained.

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3.2.1. String Type Parameters

A string, either enclosed between quotes or not, is considered to be 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 string is always case sensitive.

A small set of commands requires always to write 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/**" or **AT#/** or **at#/**.
The **termination character** may be selected by a user option (parameter S3), the default being **<CR>**.
The basic structures of the command line are:

- **ATCMD1<CR>** where **AT** is the command line prefix, **CMD1** is the body of a **basic command** (nb: the name of the command never begins with the character "+") and **<CR>** is the command line terminator character
- **ATCMD2=10<CR>** where 10 is a subparameter
- **AT+CMD1;+CMD2=, ,10<CR>** These are two examples of **extended commands** (nb: the name of the command always begins with the character "+"[3]). They are delimited with semicolon. In the second command the subparameter is omitted.
- **+CMD1?<CR>** This is a Read command for checking current subparameter values
- **+CMD1=?<CR>** This is a test command for checking possible subparameter values

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

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

[3] 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**

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 subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code **<CR><LF>ERROR<CR><LF>** is sent and no subsequent commands in the command line are processed.

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

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

NOTE:

The command line buffer accepts a maximum of 400 characters. If this number is exceeded none of the commands will be executed and TA returns **ERROR**.

3.2.2.1. 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

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Numeric Format	Verbose Format
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
GPRS related errors to a failure to perform an Attach	
103	Illegal MS (#3)*
106	Illegal ME (#6)*
107	GPRS service not allowed (#7)*
111	PLMN not allowed (#11)*
112	Location area not allowed (#12)*
113	Roaming not allowed in this location area (#13)*
GPRS related errors to a failure to Activate a Context and others	
132	service option not supported (#32)*
133	requested service option not subscribed (#33)*
134	service option temporarily out of order (#34)*
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
IP Easy 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

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Numeric Format	Verbose Format
563	tx error
564	already listening
566	can not resume socket
567	wrong APN
568	wrong PDP
569	service not supported
570	QOS not accepted
571	NSAPI already used
572	LLC or SNDCP failure
573	network reject
Custom SIM Lock related errors	
586	MCL personalisation PIN required
FTP related errors	
600	generic undocumented error
601	wrong state
602	Can not activate
603	Can not resolve name
604	Can not allocate control socket
605	Can not connect control socket
606	Bad or no response from server
607	Not connected
608	Already connected
609	Context down
610	No photo available
611	Can not send photo
612	Resource used by other instance
AES commands	
955	AES encryption or decryption is working
956	AES empty buffer
957	AES key wrong or not stored
958	AES data wrong length

*(values in parentheses are GSM 04.08 cause codes)

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3.2.2.2. 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	GSM 04.11 Annex E-2 values
128...255	3GPP TS 23.040 sub clause 9.2.3.22 values
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network time-out
340	no +CNMA acknowledgement expected
500	unknown error
512	FDN not allowed number

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3.2.3. 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 or CONNECT <text>[4]
2	RING
3	NO CARRIER
4	ERROR
6	NO DIALTONE
7	BUSY
8	NO ANSWER
10	CONNECT 2400[4]
11	CONNECT 4800[4]
12	CONNECT 9600[4]
15	CONNECT 14400[4]
23	CONNECT 1200/75[4]

[4] <text> can be"300", "1200", "2400", "4800", "9600", "14400" or "1200/75"

3.2.4. 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 only involve internal setups or readings, have an immediate response. Commands that interact with the SIM or the network could take many seconds to send a 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.

3.2.5. 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.

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** which was historically the one that was saved and restored in early releases of code, and the **extended section** which 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 startup. **&Y** instructs the device to load at startup only the **base section**. **&P** instructs the device to load at startup the full profile: **base + extended sections**.
The **&F** command resets to factory profile values only the command of the base section of profile, while the **&F1** resets to factory profile values the full set of base + extended section commands.

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

The values set by following commands are stored in the profile base section; they depend on the specific AT instance:

DTE SPEED	+IPR
DTE FORMAT	+ICF
GSM DATA MODE	+CBST
AUTOBAUD	+IPR
COMMAND ECHO	E
RESULT MESSAGES	Q
VERBOSE MESSAGES	V
EXTENDED MESSAGES	X
DSR (C107) OPTIONS	&S
DTR (C108) OPTIONS	&D
RI (C125) OPTIONS	\R
POWER SAVING	+CFUN (it does not depend on the specific AT instance; value is always taken from Instance 0)
DEFAULT PROFILE	&Y
S REGISTERS	S0;S2;S3;S4;S5;S7;S10;S12;S25
BEARER SERVICE NAME	+CBST

The values set by following commands are stored in the profile extended section and they depend on the specific AT instance (see **+CMUX**):

+FCLASS	+CSCS	+CR
+CREG	+CLIP	+CRLP
+CRC	+CLIR	+CSVM
+CCWA	+CUSD	+CAOC
+CSSN	+CIND	+CMER
+CPBS	+CMEE	+CGREG
+CGEREP	+CMGF	+CSDH
+CNMI	#QSS	#ECAM
#SMOV	#MWI	#NITZ
#SKIPESC	#CFF	#STIA
+CSTF	+CSDF	+CTZU
+CAPD	+CCWE	+CSIL
+CTZR	#NWEN	#PSNT
#SIMPR	+COLP	#CESTHLCK
+DR	$GPSNUM	+CSTA
+NCIH		

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The values set by following commands are stored in the profile extended section and they don't depend on the specific AT instance (see **+CMUX**):

+CALM	+CRSL	+CMUT
+CLVL	+VTD	+CSCB[5]
#CAP	#SRS	#SRP
#STM	#TSVOL	#E2SMSRI
#PSEL	#CODEC	#SHFEC
#HFMICG	#HSMICG	#SHFSD
#SPKMUT	#NITZ	#E2SLRI
#HFRECG	#HSRECG	#SHFAGC
#SHSAGC	#SHSEC	#SHSNR
#SHFNR	#SHSSD	#DVI
#DVIEXT	#PSMRI	#SIMDET

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 startup:

#SELINT	+COPS[6]	+CGCLASS
+CGDCONT	+CGQMIN	+CGQREQ
#ENS	#SCFG	#AUTOATT
#DNS	#ICMP	#GSMCONT
+CGSMS	+CGEQMIN	+CGEQREQ
#SMSMODE		

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[7] command and restored by +CRES[7] command

#SLED		

stored by #SLEDSAV command

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

stored by #SKTSAV command and automatically restored at startup; factory default valutes are restored by #SKTRST command

[5] +CSCB is still stored in the profile extended section only for backward compatibility issues: its actual storing and restoring are accomplished issuing **+CSAS** and **+CRES**

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

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

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#ESMTP	#EADDR	#EUSER
#EPASSW		

stored by #ESAV command and automatically restored at startup; factory default valutes are restored by #ERST command.

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

stored by $GPSSAV command and automatically restored at startup; factory default valutes are restored by $GPSRST command

#BIQUADIN	# BIQUADINEX	# BIQUADOUT
# BIQUADOUTEX		

stored by #PSAV command and automatically restored at startup; factory default valutes are restored by #PRST command.

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4. AT Commands Availability Table

The following table highlights the availability of commands which are not shared between all the versions of the product (● = Supported; **X** = Not Supported):

	HE910										UE910					UL865					UE866
COMMAND	G	DG	D	GL	EUG	EUR	EUD	NAG	NAR	NAD	EUR	EUD	NAR	NAD	N3G	EUR	EUD	NAR	NAD	N3G V2	N3G
D	●	●[*]	●[*]	●[*]	●[*]	●	●[*]	●[*]	●	●[*]	●	●[*]	●	●[*]	●	●	●[*]	●	●[*]	●	●
A	●	●[*]	●[*]	●[*]	●[*]	●	●[*]	●[*]	●	●[*]	●	●[*]	●	●[*]	●	●	●[*]	●	●[*]	●	●
S0	●	●[*]	●[*]	●[*]	●[*]	●	●[*]	●[*]	●	●[*]	●	●[*]	●	●[*]	●	●	●[*]	●	●[*]	●	●
#RXDIV	●	●	●	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
#RXTOGGLE	●	●	●	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
$GPSP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
$GPSR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
$GPSNMUN	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
$GPSACP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
$GPSSAV	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
$GPSRST	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
$GPSNVRAM	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$GPSQOS	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$GPSSLSR	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$GPSSTOP	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LCSSLP	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LCSLUI	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LCSTER	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LICLS	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LCSLRMT	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LCSLRV	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LTC	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
$LCSLK	●	●	X	X	●	X	X	●	X	X	X	X	X	X	X	X	X	X	X	X	X
#ANAMICG	X	X	X	X	X	X	X	X	X	X	●	X	●	X	●	●	X	●	X	●	●
#DIGMICG	X	X	X	X	X	X	X	X	X	X	●	X	●	X	●	●	X	●	X	●	●
#ECHOCFG	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#SPCM	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#CAP	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#SRS	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#SRP	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#HFMICG	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#HSMICG	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#HFRECG	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#HSRECG	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#SHFSD	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#SHSSD	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#SPKMUT	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#STM	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#TONE	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#TONEEXT	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●
#TSVOL	●	X	X	●	X	●	X	X	●	X	●	X	●	X	●	●	X	●	X	●	●

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	HE910										UE910					UL865					UE866
COMMAND	G	DG	D	GL	EUG	EUR	EUD	NAG	NAR	NAD	EUR	EUD	NAR	NAD	N3G	EUR	EUD	NAR	NAD	N3G V2	N3G
#UDTSET	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#UDTSAV	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#UDTRST	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#PRST	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#PSAV	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#PSEL	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#BIQ UADIN	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#BIQ UADINEX	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#BIQ UADOUT	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#BIQ UADOUTEX	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#SHFEC	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#SHSEC	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#SHFAGC	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#SHSAGC	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#SHFNR	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#SHSNR	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#DTMF	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#DVI	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#DVIEXT	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#DVICLK	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#TTY	•	X	X	•	X	•	X	X	•	X	•	X	•	X	•	•	X	•	X	•	•
#BND	•	•	•	•	•	•	•	•	•	•	X	X	X	X	X	X	X	X	X	X	X
#AUTOBND	•	•	•	•	•	•	•	•	•	•	X	X	X	X	X	X	X	X	X	X	X
#MSCLASS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	X	•	•	•	•	X	X
#ENCALG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	X	•	•	•	•	X	X
+WS46	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•**	•	•	•	•	•**	•**
+COPS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•**	•	•	•	•	•**	•**
#CODEC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•**	•	•	•	•	•**	•**
#BCCHLOCK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•**	•	•	•	•	•**	•**
$GPSD	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSGPIO	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSSERSPEED	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSAT	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSPS	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSWK	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSSW	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSCON	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSIFIX	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GNSSIFIX	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$FTPGETIFIX	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$HTTPGETIFIX	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$WPATCH	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$EPATCH	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$LPATCH	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$DPATCH	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$GPSSTAGPS	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$HTTPGETSTSEED	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•
$INJECTSTSEED	X	X	•	•	X	•	•	X	•	•	•	•	•	•	•	•	•	•	•	•	•

	HE910										UE910					UL865					UE866
COMMAND	G	DG	D	GL	EUG	EUR	EUD	NAG	NAR	NAD	EUR	EUD	NAR	NAD	N3G	EUR	EUD	NAR	NAD	N3G V2	N3G
#SYSHALT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	•	•	•	•	•	•

NOTE *: This is a **data only** product, with restrictions in the execution of this commands.

NOTE **: This is a **3G only** product, with restrictions in the execution of this commands.

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5. AT Commands References

5.1. Command Line General Format

5.1.1. Command Line Prefixes

5.1.1.1.1. Starting A Command Line - AT

AT - Starting A Command Line		SELINT 2
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, with the only exception of AT#/ prefix	
Reference	3GPP TS 27.007	

5.1.1.1.2. Last Command Automatic Repetition - A/

A/ - Last Command Automatic Repetition		SELINT 2
A/	If the prefix **A/** or **a/** is issued, the MODULE immediately execute once again the body of the preceding command line. No editing is possible and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired. If **A/** is issued before any command line has been executed, the preceding command line is assumed to have been empty (that results in an **OK** result code). Note: this command works only at fixed IPR. Note: the custom prefix AT#/ has been defined: it causes the last command to be executed again too; but it doesn't need a fixed IPR.	
Reference	V25ter	

5.1.1.1.3. Repeat Last Command - AT#/

AT#/ - Repeat Last Command		SELINT 2
AT#/	The prefix is used to execute again the last received command.	

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5.1.2. General Configuration Commands

5.1.2.1.1. Select Interface Style - #SELINT

#SELINT - Select Interface Style	**SELINT 2**
AT#SELINT=[<v>]	Set command sets the AT command interface style depending on parameter **<v>**. Parameter: **<v>** - AT command interface style 2 - switches the AT command interface style of the product, to the new products like HE910
AT#SELINT?	Read command reports the current interface style.
AT#SELINT=?	Test command reports the available range of values for parameter **<v>**.
Note	Issuing **AT#SELINT=<v>** when the 3GPP TS 27.010 multiplexing protocol control channel has been enabled (see **+CMUX**) causes an **ERROR** result code to be returned.

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5.1.3. Hayes Compliant AT Commands

5.1.3.1. Generic Modem Control

5.1.3.1.1. Set To Factory-Defined Configuration - &F

&F - Set To Factory-Defined Configuration	**SELINT 2**
AT&F[<value>]	Execution command sets the configuration parameters to default values specified by manufacturer; it takes in consideration hardware configuration switches and other manufacturer-defined criteria. Parameter: **<value>**: 0 - just the factory profile base section parameters are considered. 1 - either the factory profile base section and the extended section are considered (full factory profile). Note: if parameter **<value>** is omitted, the command has the same behaviour as **AT&F0**
Reference	V25ter.

5.1.3.1.2. Soft Reset - Z

Z - Soft Reset	**SELINT 2**
ATZ[<n>]	Execution command loads the base section of the specified user profile and the extended section of the default factory profile. Parameter: **<n>** 0..1 - user profile number Note: any call in progress will be terminated. Note: if parameter **<n>** is omitted, the command has the same behaviour as **ATZ0**.
Reference	V25ter.

5.1.3.1.3. Select Active Service Class - +FCLASS

+FCLASS - Select Active Service Class	SELINT 2
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

5.1.3.1.4. Default Reset Basic Profile Designation - &Y

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

5.1.3.1.5. Default Reset Full Profile Designation - &P

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

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5.1.3.1.6. Store Current Configuration - &W

&W - Store Current Configuration	SELINT 2
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**.

5.1.3.1.7. Store Telephone Number - &Z

&Z - Store Telephone Number In The Wireless Module Internal Phonebook	SELINT 2
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*>**.

5.1.3.1.8. Display Stored Numbers - &N

&N - Display Internal Phonebook Stored Numbers	SELINT 2
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.

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5.1.3.1.9. Manufacturer Identification - +GMI

+GMI - Manufacturer Identification		SELINT 2
AT+GMI	Execution command returns the manufacturer identification.	
Reference	V.25ter	

5.1.3.1.10. Model Identification - +GMM

+GMM - Model Identification		SELINT 2
AT+GMM	Execution command returns the model identification.	
Reference	V.25ter	

5.1.3.1.11. Revision Identification - +GMR

+GMR - Revision Identification		SELINT 2
AT+GMR	Execution command returns the software revision identification.	
Reference	V.25ter	

5.1.3.1.12. Capabilities List - +GCAP

+GCAP - Capabilities List		SELINT 2
AT+GCAP	Execution command returns the equipment supported command set list. Where: **+CGSM**: GSM ETSI command set **+FCLASS**: Fax command set **+DS**: Data Service common modem command set **+MS**: Mobile Specific command set **+ES**: WCDMA data Service common modem command set	
Reference	V.25ter	

5.1.3.1.13. Serial Number - +GSN

+GSN - Serial Number		SELINT 2
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	

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5.1.3.1.14. Display Configuration And Profile - &V

&V - Display Current Base Configuration And Profile	**SELINT 2**
AT&V	Execution command returns some of the base configuration parameters settings. Note: the row of information about **CTS (C106) OPTIONS** is in the output of **&V** only for compatibility reasons and represents only a dummy value.

5.1.3.1.15. Display Configuration And Profile - &V0

&V0 - Display Current Configuration And Profile	**SELINT 2**
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. Note: the row of information about **CTS (C106) OPTIONS** is in the output of **&V0** only for compatibility reasons and represents only a dummy value.

5.1.3.1.16. S Registers Display - &V1

&V1 - S Registers Display	**SELINT 2**
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

5.1.3.1.17. Extended S Registers Display - &V3

&V3 - Extended S Registers Display	SELINT 2
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

5.1.3.1.18. Display Last Connection Statistics - &V2

&V2 - Display Last Connection Statistics	SELINT 2
AT&V2	Execution command returns the last connection statistics & connection failure reason.

5.1.3.1.19. Single Line Connect Message - \V

\V - Single Line Connect Message	SELINT 2
AT\V<n>	Execution command set single line connect message. Parameter: **<n>** 0 - off 1 - on

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5.1.3.1.20. Country Of Installation - +GCI

+GCI - Country Of Installation		SELINT 2
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.	

5.1.3.1.21. Line Signal Level - %L

%L - Line Signal Level		SELINT 2
AT%L	It has no effect and is included only for backward compatibility with landline modems	

5.1.3.1.22. Line Quality - %Q

%Q - Line Quality		SELINT 2
AT%Q	It has no effect and is included only for backward compatibility with landline modems	

5.1.3.1.23. Speaker Loudness - L

L - Speaker Loudness		SELINT 2
ATL<n>	It has no effect and is included only for backward compatibility with landline modems	

5.1.3.1.24. Speaker Mode - M

M - Speaker Mode		SELINT 2
ATM<n>	It has no effect and is included only for backward compatibility with landline modems	

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5.1.3.2. DTE - Modem Interface Control

5.1.3.2.1. Command Echo - E

E - Command Echo	SELINT 2
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

5.1.3.2.2. Quiet Result Codes - Q

Q - Quiet Result Codes	SELINT 2
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

5.1.3.2.3. Response Format - V

<table>
<tr><td>V - Response Format</td><td>SELINT 2</td></tr>
<tr><td>ATV[<n>]</td><td>Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (see [§3.2.3 Information Responses And Result Codes] for the table of result codes).

Parameter:
<n>
0 - limited headers and trailers and numeric format of result codes

<table><tr><td>information responses</td><td><text><CR><LF></td></tr><tr><td>result codes</td><td><numeric code><CR></td></tr></table>
1 - full headers and trailers and verbose format of result codes (factory default)

<table><tr><td>information responses</td><td><CR><LF>
<text><CR><LF></td></tr><tr><td>result codes</td><td><CR><LF>
<verbose code><CR><LF></td></tr></table>
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</td></tr>
<tr><td>Reference</td><td>V25ter</td></tr>
</table>

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5.1.3.2.4. Extended Result Codes - X

X - Extended Result Codes	SELINT 2
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>** - (factory default is 1) 0 - on entering dial-mode **CONNECT** result code is given; **OK**, **CONNECT**, **RING**, **NO CARRIER**, **ERROR**, **NO ANSWER** result codes are enabled. Dial tone and busy detection (**NO DIALTONE** and **BUSY** result codes) are disabled. 1..4 - on entering dial-mode **CONNECT <text>** result code is given; all the other result codes are enabled. Note: If parameter is omitted, the command has the same behaviour of **ATX0**
Note	For complete control on **CONNECT** response message see also **+DR** command.
Reference	V25ter

5.1.3.2.5. Identification Information - I

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

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

&C - Data Carrier Detect (DCD) Control	SELINT 2
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**
Reference	V25ter

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

&D - Data Terminal Ready (DTR) Control	SELINT 2
AT&D[<n>]	Set command controls the Module behaviour to the RS232 **DTR** transitions. Parameter: **<n>** 0 - device ignores **DTR** transitions (factory default); if **+CVHU** current setting is **different from 2** then every setting **AT&D0** is equivalent to **AT&D5** 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; if **+CVHU** current setting is **different from 2** then issuing **AT&D1** is equivalent to **AT&D5** 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; if **+CVHU** current setting is **different from 2** then issuing **AT&D2** is equivalent to **AT&D5** 3 - device ignores **DTR** transitions; if **+CVHU** current setting is **different from 2** then issuing **AT&D3** is equivalent to **AT&D5** 4 - **C108/1** operation is disabled; if **+CVHU** current setting is **different from 2** then issuing **AT&D4** is equivalent to **AT&D5** 5 - **C108/1** operation is enabled; same behaviour as for **<n>=2** Note: if a connection has been set up issuing either **#SKTD** or **#SKTOP**, 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**.

&D - Data Terminal Ready (DTR) Control	SELINT 2
	Note: if parameter is omitted, the command has the same behaviour of **AT&D0** Note: if AT&D2 has been issued the call is drop on falling DTR edge and NO CARRIER exits on rising DTR edge.
Reference	V25ter

5.1.3.2.8. Standard Flow Control - \Q

\Q - Standard Flow Control	SELINT 2
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

5.1.3.2.9. Flow Control - &K

&K - Flow Control	SELINT 2
AT&K[<n>]	Set command controls the RS232 flow control behaviour. Parameter: **<n>** 0 - no flow control 3 - hardware bi-directional flow control (both **RTS/CTS** active) (factory default) Note: if parameter is omitted, the command has the same behaviour as **AT&K0** Note: **&K** has no Read Command. To verify the current setting of **&K**, simply check the settings of the active profile issuing **AT&V**. Note: Hardware flow control (**AT&K3**) is not active in command mode.

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

&S - Data Set Ready (DSR) Control	SELINT 2
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 GSM traffic channel indication. Note: in power saving mode the **DSR** pin is always tied **Low**. Note: if parameter is omitted, the command has the same behaviour of **AT&S0**

5.1.3.2.11. Ring (RI) Control - \R

\R - Ring (RI) Control	SELINT 2
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**

5.1.3.2.12. Fixed DTE Interface Rate - +IPR

+IPR - Fixed DTE Interface Rate	SELINT 2
AT+IPR=<rate>	Set command specifies the **DTE** speed at which the device accepts commands during command mode operations; it may be used to fix the **DTE-DCE** interface speed. Parameter: **<rate>** 300 1200

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+IPR - Fixed DTE Interface Rate		**SELINT 2**
	2400 4800 9600 19200 38400 57600 115200 (default value) 230400 460800 921600	
AT+IPR?	Read command returns the current value of **+IPR** parameter.	
AT+IPR=?	Test command returns the list of fixed-only **<rate>** values in the format: **+IPR**: (list of fixed-only **<rate>** values)	
Reference	V25ter	

5.1.3.2.13. DTE-Modem Local Flow Control - +IFC

+IFC - DTE-Modem Local Flow Control	SELINT 2
AT+IFC=<by_te>, <by_ta>	Set command selects the flow control behaviour of the serial port in both directions: from **DTE** to **modem** (**<by_ta>** option) and from **modem** to **DTE** (**<by_te>**) Parameters: **<by_te>** - flow control option for the data received by **DTE** 0 - flow control None 2 - **C105** (**RTS**) (factory default) **<by_ta>** - flow control option for the data sent by **modem** 0 - flow control None 2 - **C106** (**CTS**) (factory default) Note: only possible commands are AT+IFC=0,0 and AT+IFC=2,2.
AT+IFC?	Read command returns active flow control settings.
AT+IFC=?	Test command returns all supported values of the parameters **<by_te>** and **<by_ta>**.
Reference	V25ter

5.1.3.2.14. DTE-Modem Character Framing - +ICF

+ICF - DTE-Modem Character Framing	SELINT 2
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 Data, 2 Stop 2 - 8 Data, 1 Parity, 1 Stop 3 - 8 Data, 1 Stop 5 - 7 Data, 1 Parity, 1 Stop **<parity>** - determines how the parity bit is generated and checked, if present; setting this subparameter is mandatory and has a meaning only if **<format>** subparameter is either 2 or 5 otherwise is not allowed. 0 - Odd 1 - Even
AT+ICF?	Read command returns current settings for subparameters **<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

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+ICF - DTE-Modem Character Framing		SELINT 2
	OK *8O1* AT+ICF = 2,0 OK *8E1* AT+ICF = 2,1 OK *8N1* AT+ICF = 3 OK *7O1* AT+ICF = 5,0 OK *7E1* AT+ICF = 5,1 OK	

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5.1.3.3. Call Control

5.1.3.3.1. Dial - D

D – Dial	**SELINT 2**
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", "D","+". Note: for backwards compatibility with landline modems modifiers "T", "P", "R", ",", "W", "!", "@" are accepted but have no effect.
ATD><str>[;]	Issues a call to phone number which corresponding alphanumeric field is **<str>**; all available memories will be searched for the correct entry. If "**;**" is present a **voice** call is performed. Parameter: **<str>** - alphanumeric field corresponding to phone number; it must be enclosed in 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; it must not be enclosed in quotation marks. SM - SIM phonebook FD - SIM fixed dialing-phonebook LD - SIM last-dialing-phonebook MC - device missed (unanswered received) calls list RC - ME received calls list 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

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D – Dial	SELINT 2
	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).
Note	Data only products do not start the call and command answer is ERROR if a voice call is requested.
Note	The escape sequence causes a closure of the link.
Example	*To dial a number in SIM phonebook entry 6:* ATD>SM6 OK *To have a voice call to the 6-th entry of active phonebook:* ATD>6; OK

D – Dial	SELINT 2
	To call the entry with alphanumeric field "Name": ATD>"Name"; OK
Reference	V25ter.

5.1.3.3.2. Tone Dial - T

T - Tone Dial	SELINT 2
ATT	Set command has no effect is included only for backward compatibility with landline modems.
Reference	V25ter.

5.1.3.3.3. Pulse Dial - P

P - Pulse Dial	SELINT 2
ATP	Set command has no effect is included only for backward compatibility with landline modems.
Reference	V25ter.

5.1.3.3.4. Answer - A

A – Answer	SELINT 2
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.
Note	Data only products do not start the call and command answer is ERROR if a voice call is requested.
Reference	V25ter.

5.1.3.3.5. Disconnect - H

H – Disconnect	SELINT 2
ATH	Execution command is used to close the current conversation (voice or data). Note: this command can be issued only in command mode; when a data conversation is active the device is in on-line mode (commands are not sensed and characters are sent to the other party), hence escape sequence is required before issuing this command, otherwise if **&D1** option is active, **DTR** pin has to be tied **Low** to return in command mode.
Reference	V25ter.

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5.1.3.3.6. Return To On Line Mode - O

O - Return To On Line Mode	SELINT 2
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**).
Note	The escape sequence causes a closure of the link.
Reference	V25ter.

5.1.3.4. Modulation Control

5.1.3.4.1. Line Quality And Auto Retrain - %E

%E - Line Quality Monitor And Auto Retrain Or Fallback/Fallforward	SELINT 2
AT%E<n>	Execution command has no effect and is included only for backward compatibility with landline modems.

5.1.3.5. Compression Control

5.1.3.5.1. Data Compression - +DS

+DS - Data Compression	SELINT 2
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

5.1.3.5.2. Data Compression Reporting - +DR

+DR - Data Compression Reporting	SELINT 2
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

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

Reference: V25ter

Note: what follows is a special way to set and read an S-parameter:

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

Example:

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

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

5.1.3.6.1. Number Of Rings To Auto Answer - S0

S0 - Number Of Rings To Auto Answer	**SELINT 2**
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**.
Note	Data only products ignore command setting and have auto answer disabled if incoming call is a voice call.
Reference	V25ter

5.1.3.6.2. Ring Counter - S1

S1 - Ring Counter	**SELINT 2**

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S1 - Ring Counter	SELINT 2
ATS1	**S1** is incremented each time the device detects the ring signal of an incoming call. **S1** is cleared as soon as no ring occur. Note: the form **ATS1** has no effect.
ATS1?	Read command returns the value of this parameter.

5.1.3.6.3. Escape Character - S2

S2 - Escape Character	SELINT 2
ATS2=[<char>]	Set command sets the ASCII character to be used as escape character. Parameter: **<char>** - escape character decimal ASCII 0..255 - factory default value is 43 (+). Note: the escape sequence consists of three escape characters preceded and followed by ***n*** ms of idle (see **S12** to set ***n***).
ATS2?	Read command returns the current value of **S2** parameter. Note: the format of the numbers in output is always 3 digits, left-filled with 0s

5.1.3.6.4. Command Line Termination Character - S3

S3 - Command Line Termination Character	SELINT 2
ATS3=[<char>]	Set command sets the value of the character either recognized by the device as command line terminator and generated by the device as part of the header, trailer, and terminator for result codes and information text, along with **S4 parameter**. Parameter: **<char>** - command line termination character (decimal ASCII) 0..127 - factory default value is 13 (ASCII **<CR>**) Note: the "previous" value of **S3** 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**.

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S3 - Command Line Termination Character	SELINT 2
	Note: the format of the numbers in output is always 3 digits, left-filled with 0s
Reference	V25ter

5.1.3.6.5. Response Formatting Character - S4

S4 - Response Formatting Character	SELINT 2
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

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5.1.3.6.6. Command Line Editing Character - S5

S5 - Command Line Editing Character	SELINT 2
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

5.1.3.6.7. Connection Completion Time-Out - S7

S7 - Connection Completion Time-Out	SELINT 2
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 (dialing), 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

5.1.3.6.8. – Carrier Off With Firm Time - S10

S10 –Carrier Off With Firm Time	SELINT 2
ATS10	Execution command has no effect and is included only for backward compatibility with landline modems

5.1.3.6.9. – Escaper Prompt Delay - S12

S12 - Escape Prompt Delay	SELINT 2
ATS12=[<time>]	Set command sets: 1) the minimum period, before receipt of the first character of the three escape character sequence, during which no other character has to be detected in order to accept it as valid first character; 2) the maximum period allowed between receipt of first or second character of

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

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5.1.3.6.10. Delay To DTR Off - S25

S25 -Delay To DTR Off	SELINT 2
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. Note: command not yet implemented Note: in power saving (e.g. CFUN 5 with DTR low) DTR has to be off at least 3 seconds for taking the action specified by command &D, independently of S25 parameter.
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

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5.1.4. 3GPP TS 27.007 AT Commands

5.1.4.1. General

5.1.4.1.1. Request Manufacturer Identification - +CGMI

+CGMI - Request Manufacturer Identification		SELINT 2
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	

5.1.4.1.2. Request Model Identification - +CGMM

+CGMM - Request Model Identification		SELINT 2
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	

5.1.4.1.3. Request Revision Identification - +CGMR

+CGMR - Request Revision Identification		SELINT 2
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	

5.1.4.1.4. Request Product Serial Number Identification - +CGSN

+CGSN - Request Product Serial Number Identification		SELINT 2
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	

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5.1.4.1.5. Select TE Character Set - +CSCS

+CSCS - Select TE Character Set	SELINT 2
AT+CSCS= [<chset>]	Set command sets the current character set used by the device. Parameter: **<chset>** - character set "GSM" - GSM default alphabet (3GPP TS 23.038) "IRA" - international reference alphabet (ITU-T T.50) "8859-1" - ISO 8859 Latin 1 character set "PCCP437" - PC character set Code Page 437 "UCS2" - 16-bit universal multiple-octet coded character set (ISO/IEC10646)
AT+CSCS?	Read command returns the current value of the active character set.
AT+CSCS=?	Test command returns the supported values for parameter **<chset>**.
Reference	3GPP TS 27.007

5.1.4.1.6. International Mobile Subscriber Identity (IMSI) - +CIMI

+CIMI - Request International Mobile Subscriber Identify (IMSI)	SELINT 2
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

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5.1.4.1.7. Multiplexing Mode - +CMUX

+CMUX - Multiplexing Mode	SELINT 2
AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]	Set command is used to enable/disable the 3GPP TS 27.010 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. **<port_speed>** transmission rate 5 - 115 200 bit/s (default) **<N1>** maximum frame size 1-1509, the default is 121 **<T1>** acknowledgement timer in units of ten milliseconds 1-255: where 10 is default (100 ms) **<N2>** maximum number of re-transmissions 0-100: currently only the range 0-5 is supported, the default is 3 **<T2>** response timer for the multiplexer control channel in units of ten milliseconds 2-255: where 30 is default (300 ms). Note: T2 must be longer than T1. **<T3>** wake up response timer in seconds 1-255: currently not supported, in case of read command 0 is returned **<k>** window size, for Advanced operation with Error Recovery options 1-7: currently not supported, in case of read command 0 is returned Note: all the CMUX protocol parameters are fixed as defined in GSM07.10 and cannot be changed.
AT+CMUX?	Read command returns the current value of **<mode>, <subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3>** and **<k>** parameters, in the format: **+CMUX: <mode>,<subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3>,<k>**
AT+CMUX=?	Test command returns the range of supported values for parameters **<mode>, <subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3>** and **<k>**.
Reference	3GPP TS 27.007, 3GPP TS 27.010

5.1.4.1.8. Read ICCID - +CCID

+CCID - Read ICCID	SELINT 2
AT+CCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)
AT+CCID=?	Test command returns the **OK** result code.

5.1.4.2. Call Control

5.1.4.2.1. Hang Up Call - +CHUP

+CHUP - Hang Up Call	SELINT 2
AT+CHUP	Execution command cancels all active and held calls, also if a multi-party session is running.
AT+CHUP=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.1.4.2.2. Select Bearer Service Type - +CBST

+CBST - Select Bearer Service Type	SELINT 2
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. Parameters: **<speed>** - data rate 0 - autobauding (automatic selection of the speed, factory default) 4 - 2400 bps (V.22bis) 5 - 2400 bps (V.26ter) 6 - 4800 bps (V.32) 7 - 9600 bps (V.32) 12 - 9600 bps (V.34) 14 - 14400 bps (V.34) 15 – 19200 bps (V.34) 16 – 28800 bps (V.34) 17 - 33600 bps (V.34) 68 - 2400 bps (V.110 or X.31 flag stuffing) 70 - 4800 bps (V.110 or X.31 flag stuffing) 71 - 9600 bps (V.110 or X.31 flag stuffing) 75 - 14400 bps (V110 or X.31 flag stuffing) 79 - 19200 bps (V.110 or X.31 flag stuffing) 80 - 28800 bps (V.110 or X.31 flag stuffing) 81 - 38400 bps (V.110 or X.31 flag stuffing) 82 - 48000 bps (V.110 or X.31 flag stuffing) 83 - 56000 bps (V.110 or X.31 flag stuffing) 84 – 64000 bps (X.31 flag stuffing) 115 – 56000 bps (bit transparent) 116 – 64000 bps (bit transparent) 120 – 32000 bps (PIAFS32k) 121 – 64000 bps (PIAFS64k) 130 – 28800 bps (multimedia) 131 – 32000 bps (multimedia)

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+CBST - Select Bearer Service Type	**SELINT 2**
	132 – 33600 bps (multimedia) 133 – 56000 bps (multimedia) 134 - 64000 bps (multimedia) **<name>** - bearer service name 0 - data circuit asynchronous (factory default) 1 - data circuit synchronous **<ce>** - connection element 0 - transparent 1 - non transparent (default) Note: the settings **AT+CBST=0,0,0** **AT+CBST=14,0,0** **AT+CBST=75,0,0** are not supported. Note: if <name>=1 then <speed>=0,4,6,7,14,68,70,71,75 is not supported. Note: the following settings are recommended **AT+CBST=71,0,1** for mobile-to-mobile calls **AT+CBST=7,0,1** for mobile-to-fix calls
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

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5.1.4.2.3. Radio Link Protocol - +CRLP

+CRLP - Radio Link Protocol	SELINT 2
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 **<mws>** - MS window Dimension 1..61 - default value is 61 **<T1>** - acknowledge timer (10 ms units). 39..255 - default value is 48 **<N2>** - retransmission attempts 1..255 - default value is 6 **<ver>** - protocol version 0
AT+CRLP?	Read command returns the current value of the RLP protocol parameters.
AT+CRLP=?	Test command returns supported range of values of the RLP protocol parameters.
Reference	3GPP TS 27.007

5.1.4.2.4. Service Reporting Control - +CR

+CR - Service Reporting Control	SELINT 2
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

+CR - Service Reporting Control	SELINT 2
	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 GSM terminal.
AT+CR?	Read command returns whether or not intermediate result code **+CR** is enabled, in the format: **+CR: <mode>**
AT+CR=?	Test command returns the supported range of values of parameter **<mode>**.
Reference	3GPP TS 27.007

5.1.4.2.5. Extended Error Report - +CEER

+CEER - Extended Error Report	SELINT 2
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 Note: if none of the previous conditions has occurred since power up then **"Normal, unspecified"** condition is reported
AT+CEER=?	Test command returns **OK** result code.
Reference	3GPP TS 27.007, GSM 04.08

5.1.4.2.6. Cellular Result Codes - +CRC

+CRC - Cellular Result Codes	SELINT 2
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>**

+CRC - Cellular Result Codes	SELINT 2
	instead of the normal **RING**. where <**type**> - call type: ASYNC - asynchronous transparent data SYNC - synchronous transparent data REL ASYNC - asynchronous non-transparent data REL SYNC - synchronous non-transparent data 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

5.1.4.2.7. Voice Hung Up Control - +CVHU

+CVHU - Voice Hang Up Control	SELINT 2
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**" behavior according to **&D** setting. **ATH** disconnects (factory default).
AT+CVHU?	Read command reports the current value of the <**mode**> parameter, in the format: **+CVHU: <mode>**
AT+CVHU=?	Test command reports the range of supported values for parameter <**mode**>

5.1.4.2.8. Select type of address - +CSTA

+CSTA – Select Type of Address	SELINT 2
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, subclause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129
AT+CSTA?	Read command returns the current value of <**type**> in the format: **+CSTA: <type>**

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+CSTA – Select Type of Address	SELINT 2
AT+CSTA=?	Test command reports the range for the parameter **<type>**

5.1.4.3. Network Service Handling

5.1.4.3.1. Subscriber Number - +CNUM

+CNUM - Subscriber Number	SELINT 2
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
Reference	3GPP TS 27.007

5.1.4.3.2. Read Operator Names - +COPN

+COPN - Read Operator Names	SELINT 2
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

5.1.4.3.3. Network Registration Report - +CREG

+CREG - Network Registration Report	SELINT 2
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>, ~~and~~ <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>, ~~and~~ <Ci>** and **<AcT>** are reported only if **<mode>=2** and the mobile is registered on some network cell.

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+CREG - Network Registration Report	SELINT 2
AT+CREG=?	Test command returns the range of supported **<mode>**
Example	AT OK at+creg? +CREG: 0,2 OK *(the MODULE is in network searching state)* at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,2 OK at+creg? +CREG: 0,1 OK *(the MODULE is registered)* at+creg? +CREG: 0,1 OK
Reference	3GPP TS 27.007

5.1.4.3.4. Operator Selection - +COPS

+COPS - Operator Selection	SELINT 2
AT+COPS= **[<mode>** **[,<format>** **[,<oper>[,< AcT>]]]]**	Set command forces an attempt to select and register the GSM 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 GSM 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) 2 - Numeric 5 or 6 digits [country code (3) + network code (2 or 3)]

+COPS - Operator Selection	**SELINT 2**
	<oper>: network operator in format defined by **<format>** parameter. **<AcT>** access technology selected: 0 GSM 2 UTRAN Note: **<mode>** parameter setting is stored in NVM and available at next reboot, if it is not **3** (i.e.: set only **<format>** parameter). Note: if **<mode>=1 or 4**, the selected network is stored in NVM too and is available at next reboot (this will happen even with a new SIM inserted) Note: **<format>** parameter setting is never stored in NVM Note: 3G only products support **<AcT>** parameter value 2 only.
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 quadruplets, each representing an operator present in the network. The quadruplets 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.
Reference	3GPP TS 27.007

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5.1.4.3.5. Select Wireless Network - +WS46

+WS46 - PCCA STD-101 Select Wireless Network	SELINT 2
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 22 UTRAN only 25 3GPP Systems (both GERAN and UTRAN) (factory default) NOTE: <n> parameter setting is stored in NVM and available at next reboot. NOTE: 3G only products support **<n>** parameter value 22 only.
AT+WS46?	Read command reports the currently selected cellular network, in the format: **+ WS46: <n>**
AT+WS46=?	Test command reports the range for the parameter **<n>**.
Reference	3GPP TS 27.007

5.1.4.3.6. Facility Lock/Unlock - +CLCK

+CLCK - Facility Lock/Unlock	SELINT 2
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	Execution command is used to lock or unlock a **ME** on a network facility. Parameters: **<fac>** - facility "PS" - PH-SIM (lock Phone to SIM card) MT asks password when other than current SIM card inserted; MT may remember certain amount of previously used cards thus not requiring password when they are inserted "PF" - lock Phone to the very First inserted SIM card (MT asks password when other than the first SIM card is inserted) "SC" - SIM (PIN request) (device asks SIM password at power-up and when this lock command issued) "AO"- BAOC (Barr All Outgoing Calls) "OI" - BOIC (Barr Outgoing International Calls) "OX" - BOIC-exHC (Barr Outgoing International Calls except to Home Country) "AI" - BAIC (Barr All Incoming Calls) "IR" - BIC-Roam (Barr Incoming Calls when Roaming outside the home country) "AB" - All Barring services (applicable only for **<mode>=0**) "AG" - All outGoing barring services (applicable only for **<mode>=0**) (not yet supported) "AC" - All inComing barring services (applicable only for **<mode>=0**) "FD" - SIM fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as **<passwd>**) "PN" - network Personalisation

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+CLCK - Facility Lock/Unlock	SELINT 2
	"PU" - network subset Personalisation "PP" - service Provider Personalization "PC" - Corporate Personalization **<mode>** - defines the operation to be done on the facility 0 - unlock facility 1 - lock facility 2 - query status **<passwd>** - shall be the same as password specified for the facility from the **DTE** user interface or with command Change Password **+CPWD** **<class>** - sum of integers each representing a class of information (default is 7) 1 - voice (telephony) 2 - data (refers to all bearer services) 4 - fax (facsimile services) 8 - short message service 16 - data circuit sync 32 - data circuit async 64 - dedicated packet access 128 - dedicated PAD access Note: when **<mode>=2** and command successful, it returns: **+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>[…]]** where **<status>** - the current status of the facility 0 - not active 1 - active **<class*n*>** - class of information of the facility
AT+CLCK=?	Test command reports all the facilities supported by the device.
Reference	3GPP TS 27.007
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
Note	It will return ERROR if executed using SMSATRUN digest mode or TCPATRUN server mode

5.1.4.3.7. Change Facility Password - +CPWD

+CPWD - Change Facility Password	SELINT 2
AT+CPWD=<fac>, <oldpwd>, <newpwd>	Execution command changes the password for the facility lock function defined by command Facility Lock **+CLCK**. Parameters: **<fac>** - facility "SC" - SIM (PIN request) "AB" - All barring services "P2" - SIM PIN2 "PS"- SIM VO **<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: ("SC",8),("AB",4),("P2",8),("PS",8) OK
Reference	3GPP TS 27.007

5.1.4.3.8. Calling Line Identification Presentation - +CLIP

+CLIP - Calling Line Identification Presentation	SELINT 2
AT+CLIP=[<n>]	Set command enables/disables the presentation of the CLI (Calling Line Identity) at the **TE**. This command refers to the GSM 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>**

+CLIP - Calling Line Identification Presentation	**SELINT 2**
	<type> - type of address octet in integer format 128 - both the type of number and the numbering plan are unknown 129 - unknown type of number and ISDN/Telephony numbering plan 145 - international type of number and ISDN/Telephony numbering plan (contains the character "+") **<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 GSM network 0 - CLIP not provisioned 1 - CLIP provisioned 2 - unknown (e.g. no network is present) Note: This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.
AT+CLIP=?	Test command returns the supported values of parameter **<n>**
Reference	3GPP TS 27.007
Note	The command changes only the report behaviour of the device, it does not change CLI supplementary service setting on the network.

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5.1.4.3.9. Calling Line Identification Restriction - +CLIR

+CLIR - Calling Line Identification Restriction	SELINT 2
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 (GSM 02.81) 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.

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5.1.4.3.10. Connected line identification presentation - +COLP

+COLP – Connected Line Identification Presentation	SELINT 2
AT+COLP=[<n>]	This command refers to the GSM/UMTS supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network. Parameters: **<n>** 0 - disables COL indication (factory default) 1 - enables COL indication When enabled (and called subscriber allows), **+COLP: <number>,<type>** intermediate result code is returned from TA to TE before any **+CR** or ITU-T Recommendation V.250 responses, where **<number>** - string type phone number of format specified by **<type>** **<type>** - type of address octet in integer format 129 - unknown type of number and ISDN/Telephony numbering plan 145 - international type of number and ISDN/Telephony numbering plan (contains the character "+") Note: if COL information is needed, it is recommended to set DIALMODE to 1 (see AT#DIALMODE command), in order to have network information available for display before returning to command mode.
AT+COLP?	Read command gives the status of **<n>**, and also triggers an interrogation of the provision status of the COLP service according 3GPP TS 22.081 (given in **<m>**) in the format: **+COLP: <n>,<m>** where: **<n>** 0 - COL presentation disabled 1 - COL presentation enabled **<m>** - status of the COLP service on the GSM network 0 - COLP not provisioned

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+COLP – Connected Line Identification Presentation	SELINT 2
	1 - COLP provisioned 2 - unknown (e.g. no network is present) Note: This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.
AT+COLP=?	Test command reports the range for the parameter **<n>**

5.1.4.3.11. Connected line identification restriction status - +COLR

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

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5.1.4.3.12. Call Forwarding Number And Conditions - +CCFC

+CCFC - Call Forwarding Number And Condition	SELINT 2
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: <status>,<class2>[,<number>,<type>[,,,<time>]][…]]**

+CCFC - Call Forwarding Number And Condition	SELINT 2
	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.
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**>.

5.1.4.3.13. Call Waiting - +CCWA

+CCWA - Call Waiting	SELINT 2
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: <status>,<class2>[…]]**

+CCWA - Call Waiting	**SELINT 2**
	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..
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

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5.1.4.3.14. Call Holding Services - +CHLD

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

5.1.4.3.15. Call deflection - +CTFR

+CTFR – Call deflection	SELINT 2
AT+CTFR=<number>[,<type>]	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 dialing string includes international access code character "+", otherwise 129 Note: Call Deflection is only applicable to an incoming voice call
AT+CTFR=?	Test command tests for command existence

5.1.4.3.16. Unstructured Supplementary Service Data - +CUSD

+CUSD - Unstructured Supplementary Service Data	SELINT 2
AT+CUSD= [<n>[,<str> [,<dcs>]]]	Set command allows control of the Unstructured Supplementary Service Data (USSD 3GPP TS 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 GSM338 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 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

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+CUSD - Unstructured Supplementary Service Data	SELINT 2
	where: **<m>**: 0 - no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation). 1 - further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 - USSD terminated by the network 3 - other local client has responded 4 - operation not supported 5 - network time out
AT+CUSD?	Read command reports the current value of the parameter **<n>**
AT+CUSD=?	Test command reports the supported values for the parameter **<n>**
Reference	3GPP TS 27.007

5.1.4.3.17. Advice Of Charge - +CAOC

+CAOC - Advice Of Charge	SELINT 2
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.

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+CAOC - Advice Of Charge	SELINT 2
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.

5.1.4.3.18. List Current Calls - +CLCC

+CLCC - List Current Calls	SELINT 2
AT+CLCC	Execution command returns the list of current calls and their characteristics in the format: **[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>** **,<alpha>[<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,** **<mpty>,<number>,<type>,<alpha>[…]]]** where: **<id*n*>** - call identification number **<dir>** - call direction 0 - mobile originated call 1 - mobile terminated call **<stat>** - state of the call 0 - active 1 - held 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.

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+CLCC - List Current Calls	SELINT 2
AT+CLCC=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.1.4.3.19. SS Notification - +CSSN

+CSSN - SS Notification	SELINT 2
AT+CSSN=[<n>[,<m>]]	It refers to supplementary service related network initiated notifications. Set command enables/disables the presentation of notification result codes from **TA** to **TE**. Parameters: **<n>** - sets the **+CSSI** result code presentation status 0 - disable 1 - enable **<m>** - sets the **+CSSU** result code presentation status 0 - disable 1 - enable When **<n>**=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code: **+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).
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

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5.1.4.3.20. Closed User Group - +CCUG

+CCUG - Closed User Group Supplementary Service Control	SELINT 2
AT+CCUG= [<n>[,<index> [,<info>]]]	Set command allows control of the Closed User Group supplementary service [GSM 02.85]. Parameters: **<n>** 0 - disable CUG temporary mode (factory default). 1 - enable CUG temporary mode: it enables to control the CUG information on the air interface as a default adjustment for all following outgoing calls. **<index>** 0..9 - CUG index 10 - no index (preferential CUG taken from subscriber data) (default) **<info>** 0 - no information (default) 1 - suppress Outgoing Access (OA) 2 - suppress preferential CUG 3 - suppress OA and preferential CUG
AT+CCUG?	Read command reports the current value of the parameters
AT+CCUG=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.1.4.3.21. Preferred Operator List - +CPOL

+CPOL - Preferred Operator List	SELINT 2
AT+CPOL= [<index>][,<format> [,<oper>[,<GSM_AcT>, <GSM_Compact_AcT>, <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

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+CPOL - Preferred Operator List		SELINT 2
	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.	
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	

5.1.4.3.22. Selection of preferred PLMN list - +CPLS

+CPLS – Selection of preferred PLMN list		SELINT 2
AT+CPLS=<list>	The execution command is used to select a list of preferred PLMNs in the SIM/USIM. Parameters: **<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) 1 - Operator controlled PLMN selector with Access Technology EFOPLMNwAcT 2 - HPLMN selector with Access Technology EFHPLMNwAcT Note: the value set by command is directly stored in NVM and doesn't depend on the specific CMUX instance.	
AT+CPLS?	Read command returns the selected PLMN selector **<list>** from the SIM/USIM.	
AT+CPLS=?	Test command returns the whole index range supported **<list>**s by the SIM/USIM.	

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5.1.4.4. Mobile Equipment Control

5.1.4.4.1. Phone Activity Status - +CPAS

+CPAS - Phone Activity Status	**SELINT 2**
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, ETSI 07.07 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

5.1.4.4.2. Set Phone functionality - +CFUN

+CFUN - Set Phone Functionality	SELINT 2
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, or rising RTS line, stops power saving and takes the ME back to full functionality level **<fun>=1**. 1 - mobile full functionality with power saving disabled (factory default) 4 - disable both TX and RX 5 - mobile full functionality with power saving enabled 7 - CYCLIC SLEEP mode: in this mode, the serial interface is periodically enabled while CTS is active. If characters are recognized on the serial interface, the ME stays active for 2 seconds after the last character was sent or received. ME exits SLEEP mode only, if AT+CFUN=1 is entered 9 - just as 0 but with different wake-up events (see SW User Guide) 12 – Fast detach **<rst>** - reset flag 0 - do not reset the ME before setting it to **<fun>** functionality level 1 - reset the device. The device is fully functional after the reset. This value is available only for <fun> = 1 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 set to **ON** (0V) to exit from power saving 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 behaviour 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

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+CFUN - Set Phone Functionality	SELINT 2
	power save, then the module will wake up and proceed normally with the unsolicited incoming call code Note: when the module detects USB port is connected, then the power saving mode is not allowed Note: in CYCLIC SLEEP mode (**AT+CFUN=7**) CTS line toggles slowly, the toggle delay is about 2 seconds Note: in CYCLIC SLEEP mode (**AT+CFUN=7**) during incoming voice call the CTS line continues to toggle Note: if **AT#ENS=1** then **AT+CFUN=0** has the same functionality of **AT+CFUN=4**
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

5.1.4.4.3. Enter PIN - +CPIN

+CPIN - Enter PIN	SELINT 2
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>** Parameters: **<pin>** - string type value **<newpin>** - string type value. To check the status of the PIN request use the command **AT+CPIN?**
AT+CPIN?	Read command reports the PIN/PUK/PUK2 request status of the device in the form: **+CPIN: <code>** where: **<code>** - PIN/PUK/PUK2 request status code READY - ME is not pending for any password SIM PIN - ME is waiting SIM PIN to be given SIM PUK - ME is waiting SIM PUK to be given PH-SIM PIN - ME is waiting phone-to-SIM card password to be given PH-FSIM PIN - ME is waiting phone-to-very first SIM card password to be given PH-FSIM PUK - ME is waiting phone-to-very first SIM card unblocking password to be given SIM PIN2 - ME is waiting SIM PIN2 to be given; this **<code>** is returned only when the last executed command resulted in PIN2 authentication failure (i.e. **+CME ERROR: 17**)

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+CPIN - Enter PIN	**SELINT 2**
	SIM PUK2 - ME is waiting SIM PUK2 to be given; this <**code**> is returned only when the last executed command resulted in PUK2 authentication failure (i.e. **+CME ERROR: 18**) PH-NET PIN - ME is waiting network personalization password to be given PH-NET PUK - ME is waiting network personalization unblocking password to be given PH-NETSUB PIN - ME is waiting network subset personalization password to be given PH-NETSUB PUK - ME is waiting network subset personalization unblocking password to be given PH-SP PIN - ME is waiting service provider personalization password to be given PH-SP PUK - ME is waiting service provider personalization unblocking password to be given PH-CORP PIN - ME is waiting corporate personalization password to be given PH-CORP PUK - ME is waiting corporate personalization unblocking password to be given Note: Pin pending status at startup depends on PIN facility setting, to change or query the default power up setting use the command **AT+CLCK=SC,<mode>,<pin>**
AT+CPIN=?	Test command returns **OK** result code.
Example	AT+CMEE=1 OK AT+CPIN? +CME ERROR: 10 *error: you have to insert the SIM* AT+CPIN? +CPIN: READY *you inserted the SIM and device is not waiting for PIN to be given* OK
Reference	3GPP TS 27.007

5.1.4.4.4. Signal Quality - +CSQ

+CSQ - Signal Quality	SELINT 2
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 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, according to the 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:

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+CSQ - Signal Quality		SELINT 2
	3GPP TS25.133 Level 3 or less 4...65 66...91 99	Scaled (displayed) RSSI 0 Level /2 - 1 31 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, ETSI 07.07 requires the Test command to be defined.	
Reference	3GPP TS 27.007	

5.1.4.4.5. Indicator Control - +CIND

+CIND - Indicator Control		SELINT 2
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) Note: When the ME is switched on all of the indicators are in registered mode.	
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	

+CIND - Indicator Control	SELINT 2
	99 - not measurable "signal" - signal quality **<ind>** - signal quality indicator range 0..7 99 - not measurable "service" - service availability **<ind>** - service availability indicator range 0 - not registered to any network 1 - registered "sounder" - sounder activity **<ind>** - sounder activity indicator range 0 - there's no any sound activity 1 - there's some sound activity "message" - message received **<ind>** - message received indicator range 0 - there is no unread short message at memory location "SM" 1 - unread short message at memory location "SM" "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 (-97) dBm..(-66) dBm (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**

+CIND - Indicator Control	SELINT 2
Reference	3GPP TS 27.007

5.1.4.4.6. 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. 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.

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+CMER - Mobile Equipment Event Reporting	SELINT 2
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

5.1.4.4.7. Select Phonebook Memory Storage - +CPBS

+CPBS - Select Phonebook Memory Storage	SELINT 2
AT+CPBS=<storage>[,<password>]	Set command selects phonebook memory storage **<storage>**, which will be used by other phonebook commands. Parameter: **<storage>** "SM" - SIM phonebook "FD" - SIM fixed dialing-phonebook (FDN)(only phase 2/2+ SIM) "LD" - SIM last-dialing-phonebook **(+CPBF** is not applicable for this storage) "MC" - device missed (unanswered received) calls list **(+CPBF** is not applicable for this storage) "RC" - ME received calls list **(+CPBF** is not applicable for this storage). "MB" - mailbox numbers stored on SIM; it is possible to select this storage only if the **mailbox** service is provided by the SIM (see **#MBN**). "DC" - ME last-dialing-phonebook **(+CPBF** is not applicable for this storage). "ME" - ME phonebook "EN" – SIM emergency numbers phonebook **(+CPBW** and **+CPBF** not applicable for this storage). "ON" - SIM own numbers (MSISDNs) phonebook **(+CPBF** is not applicable for this storage). "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

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+CPBS - Select Phonebook Memory Storage	SELINT 2
	Note: if **<password>** parameter is given, PIN2 will be verified, even if it is not required, i.e. it has already been inserted and verified during current session
AT+CPBS?	Read command returns the actual values of the parameter **<storage>**, the number of occupied records **<used>** and the maximum index number **<total>**, in the format: **+CPBS: <storage>,<used>,<total>** Note: For **<storage>="MC"**: if there are more than one missed calls from the same number the read command will return only the last call
AT+CPBS=?	Test command returns the supported range of values for the parameters **<storage>**.
Reference	3GPP TS 27.007

5.1.4.4.8. Read Phonebook Entries - +CPBR

+CPBR - Read Phonebook Entries	SELINT 2
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

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+CPBR - Read Phonebook Entries	**SELINT 2**
	Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS <hidden>: indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden Note: if "MC" is the currently selected phonebook memory storage, a sequence of missed calls coming from the same number will be saved as one missed call and **+CPBR** will show just one line of information. Note: If all queried locations are empty (but available), no information text lines will be returned, while if listing fails in an **ME** error, **+CME ERROR: <err>** is returned.
AT+CPBR=?	Test command returns the supported range of values for parameters **<index*n*>** and the maximum lengths of **<number>** , **<text>,** <group>, <secondtext> and <email> fields fields, in the format: **+CPBR: (<minIndex>** - **<maxIndex>**),**<nlength>**,**<tlength>**,<glength>,<slength>,<elength> where: **<minIndex>** - the minimum **<index>** number, integer type **<maxIndex>**- the maximum **<index>** number, integer type **<nlength>** - maximum **<number>** field length, integer type **<tlength>** - maximum **<name>** field length, integer type <glength>: integer type value indicating the maximum length of field <group> <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

+CPBR - Read Phonebook Entries	SELINT 2
	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.
Reference	3GPP TS 27.007

5.1.4.4.9. Find Phonebook Entries - +CPBF

+CPBF - Find Phonebook Entries	SELINT 2
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

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+CPBF - Find Phonebook Entries	**SELINT 2**
	by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS <hidden>: indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden Note: **+CPBF** is not applicable if the current selected storage (see **+CPBS**) is either "MC", either "RC" or "LD". Note: if **<findtext>=""** the command returns all the phonebook records. 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.
Reference	3GPP TS 27.007

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5.1.4.4.10. Write Phonebook Entry - +CPBW

+CPBW - Write Phonebook Entry	SELINT 2
AT+CPBW= **[<index>]** **[,<number> [,<type>** **[,<text>[,<group>[,<a** **dnumber>[,<adtype>[** **,<secondtext>[,<email** **>[,<hidden>]]]]]]]]**	Execution command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with **+CPBS**. Parameters: **<index>** - integer type, value in the range of location numbers of the currently selected phonebook memory storage (see **+CPBS**). **<number>** - string type, phone number in the format **<type>** **<type>** - the type of number 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") **<text>** - the text associated to the number, string type; used character set should be the one selected with command **+CSCS**. <group>: string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS <adnumber>: additional number ; string type phone number of format <adtype> <adtype>: type of address octet in integer format <secondtext>: string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS <email>: string type field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS <hidden>: indicates if the entry is hidden or not 0: phonebook entry not hidden 1: phonebook entry hidden Note: If record number **<index>** already exists, it will be overwritten. Note: if either **<number>**, **<type>** and **<text>** are omitted, the phonebook entry in location **<index>** is deleted. Note: if **<index>** is omitted or **<index>**=0, the number **<number>** is stored in the first free phonebook location. (example at+cpbw=0,"+390404192701",129,"Text" and 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.

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+CPBW - Write Phonebook Entry	SELINT 2
	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
Note	Remember to select the PB storage with **+CPBS** command before issuing PB commands.

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5.1.4.4.11. Clock Management - +CCLK

+CCLK - Clock Management	SELINT 2
AT+CCLK=<time>	Set command sets the real-time clock of the **ME**. Parameter: **<time>** - current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz" yy - year (two last digits are mandatory), range is 00..99 MM - month (two last digits are mandatory), range is 01..12 dd - day (two last digits are mandatory); The range for dd(day) depends 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
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

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5.1.4.4.12. Alarm Management - +CALA

+CALA - Alarm Management	**SELINT 2**
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 "" - (empty string) deletes the current alarm and resets all the **+CALA** parameters to the "factory default" configuration "hh:mm:ss±zz" - format to be used only when issuing **+CALA** with parameter **<recurr>** too. "yy/MM/dd,hh:mm:ss±zz" - generic format: it's the same as defined for **+CCLK** (see) **<n>** - index of the alarm 0 - The only value supported is 0. **<type>** - alarm 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. 3 - the MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE starts playing the alarm tone on the selected path for the ringer (see command **#SRP**) The device keeps on playing the alarm tone until a **#WAKE** or **#SHDN** command is received or a 90 s time-out occurs. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down. 4 - the MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE brings the pin GPIO6 high, provided its **<direction>** has been set to alarm output, and keeps it

+CALA - Alarm Management	SELINT 2
	in this state until a **#WAKE** or **#SHDN** command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down. 5 - the MODULE will make both the actions as for type=2 and **<type>=3**. 6 - the MODULE will make both the actions as for type=2 and **<type>=4**. 7 - the MODULE will make both the actions as for type=3 and **<type>=4**. 8 - the MODULE wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the MODULE sets **High** the **RI** output pin. The **RI** output pin remains **High** until next **#WAKE** issue or until a 90s timer expires. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s. After that it shuts down. **<text>** - unsolicited alarm code text string. It has meaning only if **<type>** is equal to 2 or 5 or 6. **<recurr>** - string type value indicating day of week for the alarm in one of the following formats: "<1..7>[,<1..7>[, …]]" - it sets a recurrent alarm for one or more days in the week; the digits 1 to 7 corresponds to the days in the week (Monday is 1). "0" - it sets a recurrent alarm for all days in the week. **<silent>** - integer type indicating if the alarm is silent or not. 0 - the alarm will not be silent; 1 - the alarm will be silent. During the "alarm mode" the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SMS, the only commands that can be issued to the MODULE in this state are the **#WAKE** and **#SHDN**, every other command must not be issued during this state.
AT+CALA?	Read command returns the list of current active alarm settings in the ME, in the format: **[+CALA: <time>,<n>,<type>,[<text>],<recurr>,<silent>]**
AT+CALA=?	Test command returns the list of supported index values (currently just 0), alarm types, maximum length of the text to be displayed, maximum length of **<recurr>** and supported **<silent>**s, in the format: **+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>, <rlength>,(list of supported <silent>s)**
Example	AT+CALA="02/09/07,23:30:00+00" OK
Reference	ETSI 07.07, ETSI 27.007

5.1.4.4.13. Delete Alarm - +CALD

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+CALD - Delete Alarm		SELINT 2
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	

5.1.4.4.14. Postpone alarm - +CAPD

+CAPD – postpone or dismiss an alarm		SELINT 2
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>**	

5.1.4.4.15. Setting date format - +CSDF

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

	<auxmode>: 1 yy/MM/dd (default) 2 yyyy/MM/dd Note: The <time> format of +CCLK and +CALA is "yy/MM/dd,hh:mm:ss+zz" when <auxmode>=1 and it is "yyyy/MM/dd,hh:mm:ss+zz" when <auxmode>=2.
AT+CSDF?	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>**

5.1.4.4.16. Setting time format - +CSTF

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

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5.1.4.4.17. Time Zone reporting - +CTZR

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

5.1.4.4.18. Automatic Time Zone update - +CTZU

+CTZU – automatic Time Zone update	SELINT 2
AT+CTZU=<onoff>	This command enables and disables automatic time zone update via NITZ. Parameters: **<onoff>:** 0 Disable automatic time zone update via NITZ (default) 1 Enable automatic time zone update via NITZ Note: despite of the name, the command AT+CTZU=1 enables automatic update of the date and time set by AT+CCLK command (not only time zone). This happens when a Network Identity and Time Zone (NITZ) message is sent by the network. This command is the ETSI standard equivalent of Telit custom command AT#NITZ=1. If command AT+CTZU=1, or AT#NITZ=1 (or both) has been issued, NITZ message will cause a date and time update.
AT+CTZU?	Read command reports the currently selected **<onoff>** in the format: **+CTZU: <onoff>**
AT+CTZU=?	Test command reports the supported range of values for parameter **<onoff>**

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5.1.4.4.19. Restricted SIM Access - +CRSM

+CRSM - Restricted SIM Access	SELINT 2
AT+CRSM= <command> [,<fileid> [,<P1>,<P2>,<P3> [,<data>]]]	Execution command transmits to the **ME** the SIM **<command>** and its required parameters. **ME** handles internally all **SIM-ME** interface locking and file selection routines. As response to the command, **ME** sends the actual SIM information parameters and response data. Parameters: **<command>** - command passed on by the **ME** to the SIM 176 - READ BINARY 178 - READ RECORD 192 - GET RESPONSE 214 - UPDATE BINARY 220 - UPDATE RECORD 242 - STATUS **<fileid>** - identifier of an elementary data file on SIM. Mandatory for every command except STATUS. **<P1>**,**<P2>**,**<P3>** - parameter passed on by the **ME** to the SIM; they are mandatory for every command except GET RESPONSE and STATUS 0..255 **<data>** - information to be read/written to the SIM (hexadecimal character format). The response of the command is in the format: **+CRSM: <sw1>,<sw2>[,<response>]** where: **<sw1>**,**<sw2>** - information from the SIM about the execution of the actual command either on successful or 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
Reference	3GPP TS 27.007, GSM 11.11

5.1.4.4.20. Generic SIM access - +CSIM

+CSIM – Generic SIM access	**SELINT 0 / 1 / 2**
AT+CSIM=<lock>	Between two successive +CSIM command the SIM-ME interface must be locked to avoid commands can modify wrong SIM file. The locking and unlocking of the SIM-ME interface must be done explicitly respectively at the beginning and at the end of the +CSIM commands sequence. Parameters: <**lock**>=1 locking of the interface <**lock**>=0 unlocking of the interface In case that TE application does not use the unlock command in a certain timeout value, ME releases the locking.
AT+CSIM=<length>, <command>	The ME shall send the <**command**> as it is to the SIM/UICC. As response to the command, ME sends back the actual SIM/UICC <**response**> to the TA as it is. Parameters: **<lenght>:** number of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response) **<command>:** command passed on by the ME to the SIM/UICC in the format as described in GSM TS 11.11 or 3G TS 31.101 (hexadecimal character format) The response of the command is in the format: **+CSIM: <length>,<response>** where: <**response**> : response to the command passed on by the SIM to the ME in the format as described in GSM TS 11.11 or 3G TS 31.101 (hexadecimal character format). Error case: *+CME ERROR: <err>* possible <err> values (numeric format followed by verbose format): 3 operation not allowed *(operation mode is not allowed by the ME, wrong interface lock/unlock status)* 4 operation not supported *(wrong format or parameters of the command)* 13 SIM failure *(SIM no response)*
AT+CSIM=?	Test command returns the **OK** result code.
Example	***Lock SIM interface*** **AT+CSIM=1** **OK** **2G SIM (TS 11.11):**

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+CSIM – Generic SIM access	SELINT 0 / 1 / 2
	AT#ENAUSIM? +ENAUSIM: 0 OK *STATUS* AT+CSIM=10,A0F2000016 +CSIM:48,”000002A87F200200000000000099300220800838A838A9000” OK *SELECT EF 6F07* AT+CSIM=14,A0A40000026F07 +CSIM: 4,”9F0F” OK *GET RESPONSE* AT+CSIM=10,A0C000000F +CSIM: 34,”000000096F0704001A001A010200009000” OK *SELECT EF 6F30* AT+CSIM=14,A0A40000026F30 +CSIM: 4,”9F0F” OK *READ BINARY* AT+CSIM=10,A0B00000FC +CSIM:508,”FFFFFF1300831300901300541300301300651300381300801301801 3000113110913013013009813007713005913004313008113009513014013002313 0016330420130041FFFFFFFFFFFF21436542F41922F28822F201FFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FFFFFFFFFFFFFFFFFF9000” OK **<u>3G UICC (3G TS 31.101):</u>** AT#ENAUSIM?

+CSIM – Generic SIM access	SELINT 0 / 1 / 2

+ENAUSIM: 1

OK

STATUS
AT+CSIM=10,A0F2000016
+CME ERROR: operation not supported

STATUS
AT+CSIM=10,80F2000016
+CSIM:48,"623F8202782183027FF08410A0000000871002FFFFFF9000"

OK

SELECT EF 6F07 No Data Returned
AT+CSIM=18,00A4080C047F206F07
+CSIM: 4,"9000"

OK

SELECT EF 6F30 Return FCP Template
AT+CSIM=18,00A40804047F206F30
+CSIM: 4,"6120"

OK

GET RESPONSE
AT+CSIM=10,00C0000020
+CSIM:68,"621E8202412183026F30A506C00140DE01008A01058B036F060480
02006988009000"

OK

READ BINARY
AT+CSIM=10,00B0000069
+CSIM:214,"02F81012F47022F83082F63082F64022F60192F31412F6031300613
2F40102F20162
F21032F23002F60182F41012F91042F41902F46102F40242F22092F52072F22062
F03062F86032F0
1032F11042F01032F80217F60127F42027F43027F44027F24337F62037F0209000
"

OK

Unlock SIM interface

+CSIM – Generic SIM access	SELINT 0 / 1 / 2
	AT+CSIM=0 **OK**
Note	After the locking of the SIM-ME interface (AT+CSIM=1) the SIM will be accessible only by AT+CSIM commands (#QSS: 0). The GSM and GPRS services will be automatically deregistered to avoid the TE commands alter the GSM application. They will be automatically reconditioned after the unlocking of the SIM-ME interface. After the unlocking of the SIM-ME interface if PIN is required it will be necessary to enter it another time.

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5.1.4.4.21. Alert Sound Mode - +CALM

+CALM - Alert Sound Mode	SELINT 2
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

5.1.4.4.22. Ringer Sound Level - +CRSL

+CRSL - Ringer Sound Level	SELINT 2
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: <level>**
AT+CRSL=?	Test command reports **<level>** supported values as compound value. **+CRSL: (0-4)**
Reference	3GPP TS 27.007

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5.1.4.4.23. Loudspeaker Volume Level - +CLVL

+CLVL - Loudspeaker Volume Level	SELINT 2
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

5.1.4.4.24. Microphone Mute Control - +CMUT

+CMUT - Microphone Mute Control	SELINT 2
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

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5.1.4.4.25. Silence command - +CSIL

+CSIL – silence command	SELINT 2
AT+CSIL=[<mode>]	This command enables/disables the silent mode. When the phone is in silent mode, all signalling tones from MT are suppressed. Parameters: **<mode>:** 0 Silent mode off (default) 1 Silent mode on
AT+CSIL?	Read command reports the currently selected **<mode>** in the format: **+CSIL: <mode>**
AT+CSIL=?	Test command reports the supported range of values for parameter **<mode>**

5.1.4.4.26. Accumulated Call Meter - +CACM

+CACM - Accumulated Call Meter	SELINT 2
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

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5.1.4.4.27. Accumulated Call Meter Maximum - +CAMM

+CAMM - Accumulated Call Meter Maximum	SELINT 2
AT+CAMM=[<acmmax>[,<pwd>]]	Set command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax). This value represents the maximum number of home units allowed to be consumed by the subscriber. When ACM reaches **<acmmax>** value further calls are prohibited. Parameter: **<acmmax>** - ACMmax value, integer type: it is the maximum number of home units allowed to be consumed by the subscriber. **<pwd>** - PIN2; if PIN2 has been already input once after startup, it is required no more Note: **<acmmax>** = 0 value disables the feature.
AT+CAMM?	Read command reports the ACMmax value stored in SIM in the format: **+CAMM : <acmm>** where: **<acmm>** - ACMmax value in home units, string type: three bytes of the ACMmax value in hexadecimal format (e.g. "00001E" indicates decimal value 30)
AT+CAMM=?	Test command returns the **OK** result code
Reference	3GPP TS 27.007

5.1.4.4.28. Price per Unit and Currency Table - +CPUC

+CPUC - Price Per Unit And Currency Table	SELINT 2
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:

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+CPUC - Price Per Unit And Currency Table		SELINT 2
	+CPUC : <currency>,<ppu>	
AT+CPUC=?	Test command returns the **OK** result code	
Reference	3GPP TS 27.007	

5.1.4.4.29. Call meter maximum event - +CCWE

+CCWE – Call Meter maximum event		SELINT 2
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. Parameters: **<mode>:** 0 Disable the call meter warning event (default) 1 Enable the call meter warning event Note: the set command will respond with an error if the Accumulated Call Meter service is not active in SIM	
AT+CCWE?	Read command reports the currently selected <mode> in the format: **+CCWE: <mode>**	
AT+CCWE=?	Test command reports the supported range of values for parameter **<mode>**	

5.1.4.4.30. Set voice mail number - +CSVM

+CSVM – Set Voice Mail Number		SELINT 2
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	

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+CSVM – Set Voice Mail Number	SELINT 2
	145 - international type of number and ISDN/Telephony numbering plan (contains the character "+") Note: Set command is dummy. It only checks for parameters values validity; it does not send any actual write request to SIM to update voice mail number, nor sends any request to network to enable/disable voice mail..
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>**.

5.1.4.4.31. Available AT Commands - +CLAC

+CLAC - Available AT Commands	SELINT 2
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

Mobile Equipment Errors

5.1.4.4.32. Report Mobile Equipment Error - +CMEE

+CMEE - Report Mobile Equipment Error	**SELINT 2**
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

5.1.4.4.33. Open Logical Channel - +CCHO

+CCHO – Open Logical Channel	**SELINT 2**
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 currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical channel; select the application identified by the <**dfname**> received with this command and return a session Id as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel. This <**sessionid**> is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or Generic UICC Logical Channel access +CGLA commands. Parameter: **<dfname>** : all selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes

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+CCHO – Open Logical Channel	SELINT 2
	The response of the command is in the format: **+CCHO:** < **sessionid** > where: <**sessionid**> integer type; a session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism See 3GPP TS 31.101 for more information about defined values. Error case: *+CME ERROR: <err>* possible <err> values (numeric format followed by verbose format): 3 operation not allowed (*operation mode is not allowed by the ME*) 4 operation not supported (*wrong format or parameters of the command*) 13 SIM failure (*SIM response SW1 SW2 status byte Error*) 15 SIM wrong (*SIM response SW1 SW2 status byte Error*) 100 unknown (*generic error*) Note: The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 for further information on logical channels in APDU commands protocol.
AT+CCHO=?	Test command returns the **OK** result code.

5.1.4.4.34. Close Logical Channel - +CCHC

+CCHC – Close Logical Channel	SELINT 2
AT+CCHC=<sessionid>	This command asks the ME to close a communication session with the active UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command. Parameter: **<sessionid>** : integer type; a session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism. Error case: *+CME ERROR: <err>* possible <err> values (numeric format followed by verbose format):

	3 operation not allowed (*operation mode is not allowed by the ME*) 4 operation not supported (*wrong format or parameters of the command*) 13 SIM failure (*SIM response SW1 SW2 status byte Error*) 15 SIM wrong (*SIM response SW1 SW2 status byte Error*) 21 invalid index (*<**sessionid**> not correspond to an opened channel*) 100 unknown (*generic error*)
AT+CCHC=?	Test command returns the **OK** result code.

5.1.4.4.35. Generic UICC Logical Channel Access - +CGLA

+CGLA – Generic UICC Logical Channel Access	**SELINT 2**
AT+CGLA=<sessionid>,<length>,<command>	Set command transmits to the MT the <**command**> it then shall send as it is to the selected UICC. In the same manner the UICC <**response**> shall be sent back by the MT to the TA as it is. This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS. Parameter: <**sessionid**> : integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0") <**length**> : integer type; length of the characters that are sent to TE in <**command**> or <**response**> (two times the actual length of the command or response) <**command**> : command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format; refer +CSCS) The response of the command is in the format: **+CGLA: <length>,<response>** where: <**response**> : response to the command passed on by the SIM to the ME in the format as described in GSM TS 11.11 or 3G TS 31.101 (hexadecimal character format). See 3GPP TS 31.101 for more information about defined values. Error case: *+CME ERROR: <err>* possible <err> values (numeric format followed by verbose format): 3 operation not allowed (*operation mode is not allowed by the ME*)

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	4 operation not supported (*wrong format or parameters of the command*) 13 SIM failure (*SIM response SW1 SW2 status byte Error*) 15 SIM wrong (*SIM response SW1 SW2 status byte Error*) 21 invalid index (*<**sessionid**> not correspond to an opened channel*) 100 unknown (*generic error*)
AT+CGLA=?	Test command returns the **OK** result code.

5.1.4.5. Voice Control

5.1.4.5.1. DTMF Tones Transmission - +VTS

+VTS - DTMF Tones Transmission	**SELINT 2**
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**; 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

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5.1.4.5.2. Tone Duration - +VTD

+VTD - Tone Duration	**SELINT 2**
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

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5.1.4.6. Commands For GPRS

5.1.4.6.1. GPRS Mobile Station Class - +CGCLASS

+CGCLASS - GPRS mobile station class	**SELINT 2**
AT+CGCLASS= [<class>]	Set command sets the GPRS class according to **<class>** parameter. Parameter: **<class>** - GPRS class "A" - UMTS (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>**

5.1.4.6.2. GPRS Attach Or Detach - +CGATT

+CGATT - GPRS Attach Or Detach	**SELINT 2**
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

5.1.4.6.3. GPRS Event Reporting - +CGEREP

+CGEREP - GPRS Event Reporting	SELINT 2
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

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+CGEREP - GPRS Event Reporting	SELINT 2
	+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

5.1.4.6.4. GPRS Network Registration Status - +CGREG

+CGREG - GPRS Network Registration Status	SELINT 2
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>]]**

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+CGREG - GPRS Network Registration Status	SELINT 2
	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>]]** 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

5.1.4.6.5. Define PDP Context - +CGDCONT

+CGDCONT - Define PDP Context	SELINT 2
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 "IPV6" - Internet Protocol version 6 "IPV4V6" - Virtual <PDP_type> introduced to handle dual IP stack UE capability <**APN**> - (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is empty (“”) or omitted, then the subscription value will be requested. <**PDP_addr**> - a string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the **+CGPADDR** command.

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+CGDCONT - Define PDP Context	**SELINT 2**
	<d_comp> - numeric parameter that controls PDP data compression 0 - off (default if value is omitted) 1 - on **<h_comp>** - numeric parameter that controls PDP header compression 0 - off (default if value is omitted) 1 - on **<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 AT+CGDCONT? +CGDCONT: 1,”IP”,“*APN”*,”10.10.10.10”,0,0 OK AT+CGDCONT=? +CGDCONT: (1-5),”IP”,,,(0-1),(0-1) OK
Reference	3GPP TS 27.007

5.1.4.6.6. Quality Of Service Profile - +CGQMIN

+CGQMIN - Quality Of Service Profile (Minimum Acceptable)	SELINT 2
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. Note: set command can modify the 3G QoS according to 3GPP 23.107 (see **+CGEQMIN**).
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.
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) OK
Reference	3GPP TS 27.007; GSM 03.60

5.1.4.6.7. Quality Of Service Profile - +CGQREQ

+CGQREQ - Quality Of Service Profile (Requested)	SELINT 2
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. Note: set command can modify the 3G QoS according to 3GPP 23.107 (see **+CGEQREQ**).
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.
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)

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+CGQREQ - Quality Of Service Profile (Requested)		SELINT 2
	OK	
Reference	3GPP TS 27.007; GSM 03.60	

5.1.4.6.8. 3G Quality Of Service Profile (Requested) - +CGEQREQ

+CGEQREQ – 3G Quality Of Service Profile (Requested)	SELINT 2
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 (default value) **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1…568 576…8640 **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1…568 576…8640 8700…16000 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1…568 576…8640 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s). This parameter should be provided if the **<Traffic class>** is specified as conversational or streaming. 0 - subscribed value (default value) 1…568 576…8640

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	8700…16000 <**Delivery order**> - SDU Delivery order 0 - no 1 – yes 2 – subscribed value (default value) <**Maximum SDU size**> - Maximum SDU size in octets 0 - subscribed value (default value) 10…1500 1502 1510 1520 <**SDU error ratio**> - SDU error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2 “0E0” (default value) “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” <**Residual bit error ratio**> - Residual bitt error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2 “0E0” (default value) “5E2” “1E2” “5E3” “4E3” “1E3” “1E4” “1E5” “1E6” “6E8” <**Delivery of erroneous SDUs**> - Delivery of erroneous SDUs 0 - no 1 – yes 2 – no detect 3 – subscribed value (default value) <**Transfer delay** > - Transfer delay (milliseconds) 0 – subscribed value (default value) 10…150

	200…950 1000…4000 <**Traffic handling priority** > - Traffic handling priority 0 - subscribed value (default value) 1…3 <**Source Statistics Descriptor**> - Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the <**Traffic class**> is specified as conversational or streaming. 0 - Characteristics of SDUs is unknown (default value) 1 - Characteristics of SDUs corresponds to a speech source <**Signalling Indication**> - Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the <**Traffic class**> is specified as interactive. 0 - PDP context is not optimized for signalling (default value) 1 - PDP context is optimized for signalling <**PDP_type**> (see **+CGDCONT** command). Note: a special form of the Set command, **+CGEQREQ=<cid>** causes the requested profile for context number <**cid**> to become undefined. Note: the current settings are stored in NVM. Note: set command can modify the 2G QoS according to 3GPP 23.107 (see **+CGQREQ**).
AT+CGEQREQ?	Read command returns the current settings for each defined context in the format: **[+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling>,<Source statistics descriptor>,<Signalling indication><CR><LF>]** **[+CGEQREQ:…]** If no PDP context has been defined, it has no effect and **OK** result code is returned.
AT+CGEQREQ=?	Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format: **+CGQEQREQ: <PDP_Type>,(list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of**

	supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s), (list of supported <Source statistics descriptor>s), (list of supported <Signalling indication>s) Note: only the "IP" PDP_Type is currently supported.

5.1.4.6.9. 3G Quality Of Service Profile (Minimum Acceptable) - +CGEQMIN

+CGEQMIN – 3G Quality Of Service Profile (Minimum Acceptable)	**SELINT 2**
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 specifying 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 (default value) 1 - streaming 2 - interactive 3 - background **<Maximum bitrate UL>** - Maximum bitrate Up Link (kbits/s) 0 (default value) 1…568 576…8640 **<Maximum bitrate DL>** - Maximum bitrate down link (kbits/s) 0 (default value) 1…568 576…8640 8700…16000 **<Guaranteed bitrate UL>** - the guaranteed bitrate up link(kbits/s) 0 (default value) 1…568 576…8640 **<Guaranteed bitrate DL>** - the guaranteed bitrate down link(kbits/s) 0 (default value) 1…568

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	576…8640 8700…16000 <**Delivery order**> - SDU Delivery order 0 - no (for default value) 1 – yes <**Maximum SDU size**> - Maximum SDU size in octets 0 (default value) 10…1500 1502 1510 1520 <**SDU error ratio**> - SDU error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2 “0E0” (default value) “1E1” “1E2” “7E3” “1E3” “1E4” “1E5” “1E6” <**Residual bit error ratio**> - Residual bit error ratio - mEe mean m*10-e , for example 1E2 mean 1*10-2 “0E0” (default value) “5E2” “1E2” “5E3” “4E3” “1E3” “1E4” “1E5” “1E6” “6E8” <**Delivery of erroneous SDUs**> - Delivery of erroneous SDUs 0 - no (default value) 1 – yes 2 – no detect <**Transfer delay** > - Transfer delay (milliseconds) 0 (default value) 10…150 200…950

	1000…4000 <**Traffic handling priority** > - Traffic handling priority 1…3 <**Source Statistics Descriptor**> - Characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the <**Traffic class**> is specified as conversational or streaming. 0 - Characteristics of SDUs is unknown (default value) 1 - Characteristics of SDUs corresponds to a speech source <**Signalling Indication**> - Signalling content of submitted SDUs for a PDP context. This parameter should be provided if the <**Traffic class**> is specified as interactive. 0 - PDP context is not optimized for signalling (default value) 1 - PDP context is optimized for signalling. Note: a special form of the Set command, **+CGEQMIN=<cid>** causes the requested profile for context number <**cid**> to become undefined. Note: the current settings are stored in NVM. Note: set command can modify the 2G QoS according to 3GPP 23.107 (see **+CGQMIN**).
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:…]** Parameters are described as for the set command except: <**Traffic class**> - Traffic class 0 – conversational (if the value is explicitly defined, otherwise, if the context or the QoS is undefined it is the default value as undefined) 1 - streaming 2 - interactive 3 – background <**Traffic handling priority** > - Traffic handling priority 0 (default value as undefined) 1…3

	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)** Note: only the "IP" PDP_Type is currently supported.

5.1.4.6.10. PDP Context activate or deactivate - +CGACT

+CGACT - PDP Context Activate Or Deactivate	**SELINT 2**
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: only three **<cid>**s can be activated at the same time. Note: if no **<cid>**s are specified, the activation form of the command activates the first three defined contexts. The deactivation form deactivates all the active 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

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+CGACT - PDP Context Activate Or Deactivate	SELINT 2
	OK
Reference	3GPP TS 27.007

5.1.4.6.11. 3G Quality Of Service Profile (Negotiated) - +CGEQNEG

+CGEQNEG – 3G Quality Of Service Profile (Negotiated)	SELINT 2
AT+CGEQNEG= **[<cid>[,<cid>[,…]]]**	This command allows the TE to retrieve the negotiated 3G quality of service returned in the Activate PDP Context Accept/Modify 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). It returns the current settings for each specified context in the format (see **+CGEQREQ**): **[+CGEQNEQ: <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><CR><LF>]** **[+CGEQNEQ:…]**
AT+CGEQNEG=?	Test command returns a list of **<cid>**s associated with active contexts.
Reference	3GPP TS 27.007

5.1.4.6.12. PDP Context - +CGACT

+CGACT - PDP Context Activate Or Deactivate	SELINT 2
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: at least three **<cid>**s can be activated at the same time. Note: if no **<cid>**s are specified, the activation form of the command activates at least the first three defined contexts. The deactivation form deactivates all the active 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

5.1.4.6.13. Show PDP Address - +CGPADDR

+CGPADDR - Show PDP Address	SELINT 2
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>**; if no address is available the empty string (“”) is represented as **<PDP_addr>**
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

5.1.4.6.14. Modify PDP context - +CGCMOD

+CGCMOD – Modify PDP context	SELINT 2
AT+CGCMOD=[<cid1>[,<cid2>[,…,<cidN>]]]	The execution command is used to modify the specified PDP context(s) with respect to QoS profiles. If no **<cid*i*>** is specified the command modifies all active contexts. Parameters: **<cid*i*>:** a numeric parameter which specifies a particular PDP context
AT+CGCMOD=?	Test command returns a list of **<cid>**s associated with active contexts.

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5.1.4.6.15. Commands for Battery Charger

5.1.4.6.15.1. Battery Charge - +CBC

+CBC - Battery Charge	**SELINT 2**
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, only if <bcs>=0 0 - battery is exhausted, or **ME** does not have a battery connected 25 - battery charge remained is estimated to be 25% 50 - battery charge remained is estimated to be 50% 75 - battery charge remained is estimated to be 75% 100 - battery is fully charged. Note: **<bcs>**=1 indicates that the battery charger supply is inserted and the battery is being recharged if necessary with it. Supply for **ME** operations is taken anyway from **VBATT** pins. Note: without battery/power connected on **VBATT** pins or during a power fault the unit is not working, therefore values **<bcs>=2** and **<bcs>=3** will never appear. Note: <bcl> indicates battery charge level only if battery is connected and charger is not connected
AT+CBC=?	Test command returns parameter values supported as a compound value. **+CBC: (0-3),(0-100)**
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

5.1.5. 3GPP TS 27.005 AT Commands for SMS and CBS

5.1.5.1. General Configuration

5.1.5.1.1. Select Message Service - +CSMS

+CSMS - Select Message Service	**SELINT 2**
AT+CSMS= <service>	Set command selects messaging service **<service>**. It returns the types of messages supported by the **ME**: Parameter: **<service>** 0 – 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005 (factory default) 1 – 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005. The requirement of **<service>** setting 1 is mentioned under corresponding command descriptions 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>**.
Reference	3GPP TS 27.005; 3GPP TS 23.040; 3GPP TS 23.041

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5.1.5.1.2. Preferred Message Storage - +CPMS

+CPMS - Preferred Message Storage	SELINT 2
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 "SM" - SIM SMS memory storage (default) "ME" – NVM SMS storage **<memw>** - memory to which writing and sending operations are made "SM" - SIM SMS memory storage (default) "ME" – NVM SMS storage **<mems>** - memory to which received SMs are preferred to be stored "SM" - SIM SMS memory storage (default) "ME" – NVM SMS storage 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 Note: when **<memr>** is set to a memory, also **<memw>** and **<mems>** are set to the same memory. Note: the set memory is automatically saved in NVM.
AT+CPMS?	Read command reports the message storage status in the format: **+CPMS: <memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>,** **<mems>,<useds>,<totals>** where **<memr>**, **<memw>** and **<mems>** are the selected storage memories for reading, writing and storing respectively.
AT+CPMS=?	Test command reports the supported values for parameters **<memr>**, **<memw>** and **<mems>**
Example	*AT+CPMS?* *+CPMS: "SM",5,10,"SM",5,10,"SM",5,10* *OK*

+CPMS - Preferred Message Storage	SELINT 2
	(you have 5 out of 10 SMS SIM positions occupied) *AT+CPMS="ME"* *+CPMS: "ME",15,100,"ME",15,100,"ME",15,100* *OK* *(change memory to ME where there are 15 SMS positions occupied)*
Reference	3GPP TS 27.005

5.1.5.1.3. Message Format - +CMGF

+CMGF - Message Format	SELINT 2
AT+CMGF= **[<mode>]**	Set command selects the format of messages used with send, list, read and write commands. Parameter: **<mode>** 0 - PDU mode, as defined in 3GPP TS 23.040 and 3GPP TS 23.041 (factory default) 1 - text mode
AT+CMGF?	Read command reports the current value of the parameter **<mode>**.
AT+CMGF=?	Test command reports the supported value of **<mode>** parameter.
Reference	3GPP TS 27.005

5.1.5.2. Message Configuration

5.1.5.2.1. Service Center Address - +CSCA

+CSCA -Service Center Address	SELINT 2
AT+CSCA= **<number>** **[,<type>]**	Set command sets the Service Center Address to be used for mobile originated SMS transmissions. Parameter: **<number>** - SC phone number in the format defined by **<type>** **<type>** - the type of number 129 - national numbering scheme 145 - international numbering scheme (contains the character "+") Note: to use the SM service, is mandatory to set a Service Center Address at which service requests will be directed.

+CSCA -Service Center Address	SELINT 2
	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.
Reference	3GPP TS 27.005

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5.1.5.2.2. Set Text Mode Parameters - +CSMP

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

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+CSMP - Set Text Mode Parameters	SELINT 2
	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 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:*

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+CSMP - Set Text Mode Parameters	SELINT 2
	AT+CSMP=17,167,0,0 OK *Set the parameters for an outgoing message with validity period in enhanced format: the <**vp**> string actually codes 24 hours of validity period.* AT+CSMP=9,"01A80000000000" OK *Set the parameters for an outgoing message with validity period in enhanced format: the <**vp**> string actually codes 60 seconds of validity period.* AT+CSMP=9,"023C0000000000" OK *Set the parameters for an outgoing message with validity period in enhanced format: the <**vp**> string actually codes 29 hours 85 minutes 30 seconds of validity period.* AT+CSMP=9,"03925803000000" OK
Reference	3GPP TS 27.005; 3GPP TS 23.040; 3GPP TS 23.038

5.1.5.2.3. Show Text Mode Parameters - +CSDH

+CSDH - Show Text Mode Parameters	SELINT 2
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

5.1.5.2.4. Select Cell Broadcast - +CSCB

+CSCB -Select Cell Broadcast Message Types	**SELINT 2**
AT+CSCB= [<mode>[,<mids> [,<dcss>]]]	Set command selects which types of Cell Broadcast Messages are to be received by the device. Parameters: **<mode>** 0 - the message types defined by **<mids>** and **<dcss>** are accepted (factory default) 1 - the message types defined by **<mids>** and **<dcss>** are rejected **<mids>** - Message Identifiers, string type: all different possible combinations of the CBM message identifiers; default is empty string (“”). **<dcss>** - Data Coding Schemes, string type: all different possible combinations of CBM data coding schemes; default is empty string (“”). Note: the current settings are stored through **+CSAS**
AT+CSCB?	Read command reports the current value of parameters **<mode>**, **<mids>** and **<dcss>**.
AT+CSCB=?	Test command returns the range of values for parameter **<mode>**.
Example	AT+CSCB? +CSCB: 1,"",""" OK *(all CBMs are accepted, none is rejected)* AT+CSCB=0,"0,1,300-315,450","0-3" OK
Reference	3GPP TS 27.005, 3GPP TS 23.041, 3GPP TS 23.038.

5.1.5.2.5. Save Settings - +CSAS

+CSAS - Save Settings	SELINT 2
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. Note: +CSCB <mids> (Message Identifiers) parameter can be saved to SIM only if the "Cell broadcast message identifier selection" file is present on the SIM itself. This file, if present, has storage for only a single set of data. Therefore, it is not possible to save different <mids> in different SIM profiles; <mids> value, once changed and saved, will be the same for all SIM profiles.
AT+CSAS=?	Test command returns the possible range of values for the parameter **<profile>**.
Reference	3GPP TS 27.005

5.1.5.2.6. Restore Settings - +CRES

+CRES - Restore Settings	SELINT 2
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

5.1.5.2.7. More message to send - +CMMS

+CMMS – More Message to Send	SELINT 2
AT+CMMS=[<n>]	Set command controls the continuity of SMS relay protocol link. When feature is enabled (and supported by network) multiple messages can be sent much faster as link is kept open. Parameter: **<n>** 0 - disable (factory default) 1 - keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 5 seconds, then the link is closed and the parameter **<n>** is automatically reset to 0 2 - enable (if the time between the response of the latest message send command and the next send command exceeds 5 seconds, the link is closed but the parameter **<n>** remains set to 2)
AT+CMMS?	Read command reports the current value of the parameter **<n>** in the format: **+CMMS: <n>**
AT+CMMS=?	Test command returns the range of supported **<n>**
Reference	3GPP TS 27.005

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5.1.5.3. Message Receiving And Reading

5.1.5.3.1. New Message Indications - +CNMI

+CNMI - New Message Indications To Terminal Equipment	**SELINT 2**
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 is enabled for 1 s. 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 messages are stored in SIM. 1 - If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the following unsolicited result code: **+CMTI: <mems>,<index>** where: **<mems>** - memory storage where the new message is stored (see **+CPMS**) **<index>** - location on the memory where SMS is stored. 2 - SMS-DELIVERs (except class 2 messages and messages in the "store" 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

+CNMI - New Message Indications To Terminal Equipment	SELINT 2

character set (see **+CSCS**)

<alpha> - alphanumeric representation of **<oa>**; used character set should be the one selected with command **+CSCS**.

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

<tooa>, ***<tosca>*** - type of number **<oa>** or ***<sca>***:
129 - number in national format
145 - number in international format (contains the "+")

<fo> - first octet of 3GPP TS 23.040

<pid> - Protocol Identifier

<dcs> - Data Coding Scheme

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

<length> - text length

<data> - TP-User-Data

- If **<dcs>** indicates that GSM03.38 default alphabet is used and **<fo>** indicates that GSM03.40 TP-User-Data-Header-Indication is not set (bit 6 of **<fo>** is 0), each character of GSM 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 TP-User-Data-Header-Indication is set (bit 6 of **<fo>** is 1), each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)

Class 2 messages and messages in the "store" message waiting indication group 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

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+CNMI - New Message Indications To Terminal Equipment	SELINT 2

<**pag**> - page number
<**pags**> - total number of pages of the message
<**data**> - CBM Content of Message

- If <**dcs**> indicates that GSM03.38 default alphabet is used , each character of GSM 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 is not stored
1 - the status report is sent to the **DTE** with the following unsolicited result code:

(PDU Mode)

+CDS: <length><CR><LF><PDU>
where:
<**length**> - PDU length
<**PDU**> - message PDU

(TEXT Mode)

+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>
where:
<**fo**> - first octet of the message PDU
<**mr**> - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<**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
"SM"
<**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.

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<table>
<tr><td colspan="2">+CNMI - New Message Indications To Terminal Equipment</td><td>SELINT 2</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>AT+CNMI?</td><td colspan="2">Read command returns the current parameter settings for +CNMI command in the form:

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr></td></tr>
<tr><td>AT+CNMI=?</td><td colspan="2">Test command reports the supported range of values for the +CNMI command parameters.</td></tr>
<tr><td>Reference</td><td colspan="2">3GPP TS 27.005</td></tr>
<tr><td>Note</td><td colspan="2">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.</td></tr>
<tr><td>Note</td><td colspan="2">It has been necessary to take the following decisions to get over any incoherence problem, due to the possibility to have contemporaneous different settings of parameter <mt> in different sessions (see #PORTCFG and +CMUX):

<table>
<tr><th>Message Class or Indication group, as in the DCS

<mt> settings in different sessions</th><th>SM Class is No Class
OR
SM Class is 0 or 1 or 3
OR
SM is an Indication with group “Discard”</th><th>SM Class is 3</th></tr>
<tr><td><mt>=2 for session “0”
AND
<mt>=anyvalue for other session(s)</td><td>URC is shown only on session “0”</td><td></td></tr>
<tr><td><mt>=3 for session “0”
AND
<mt>=0 or 1 for other session(s)</td><td></td><td>URC is shown only on session “0”</td></tr>
</table>
</td></tr>
<tr><td>Note</td><td colspan="2">The following table clarifies which URC is shown and if the DELIVER SM is stored, depending on the <mt> parameter value and the SM class.

<table>
<tr><td></td><td></td><td colspan="5">SM CLASS</td></tr>
<tr><td></td><td></td><td>0 / msg waiting discard</td><td>1 / no class</td><td>2</td><td>3</td><td>msg waiting store</td></tr>
<tr><td rowspan="2"><mt></td><td>0</td><td>Store in <mems></td><td>Store in <mems></td><td>Store in SIM</td><td>Store in <mems></td><td>Store in <mems></td></tr>
<tr><td>1</td><td>Store in <mems> - Send ind +CMTI</td><td>Store in <mems> - Send ind +CMTI</td><td>Store in SIM - Send ind +CMTI</td><td>Store in <mems> - Send ind +CMTI</td><td>Store in <mems> - Send ind +CMTI</td></tr>
</table>
</td></tr>
</table>

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+CNMI - New Message Indications To Terminal Equipment						SELINT 2
		2	*Route msg to TE:* ***+CMT***[8]	*Route msg to TE:* ***+CMT***[1]	Store in SIM - Send ind **+CMTI**	*Route msg to TE:* ***+CMT***[1]	Store in <mems> - Send ind **+CMTI**
		3	Store in <mems> - Send ind **+CMTI**	Store in <mems>- Send ind **+CMTI**	Store in SIM - Send ind **+CMTI**	*Route msg to TE:* ***+CMT***[1]	Store in <mems> - Send ind **+CMTI**

where <mems> is the memory where the received messages are stored (see **+CPMS**)

Note

It has been necessary to take the following decision to get over an incoherence problem, due to the possibility to have contemporaneous different settings of parameter **<ds>** in different sessions (see #PORTCFG and +CMUX):

<ds> settings in different sessions	
<ds>=1 for session "0" ***AND*** **<ds>=2** for at least one of the other sessions	**URC +CDS is shown only on session "0" and no status report is stored on SIM**
<ds>=0 for session "0" ***AND*** **<ds>=2** for at least one of the other sessions	**no URC is shown on any session and no status report is stored on SIM**

[8] The SM is not stored!

5.1.5.3.2. New message acknowledgement - +CNMA

+CNMA – New Message Acknowledgement	
AT+CNMA	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 shown. If no acknowledgement is given within the network timeout (17 seconds), 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). If command is executed, but no acknowledgement is expected, or some other ME related error occurs, final result code **+CMS ERROR: <err>** is returned. The AT command syntax and functionalities are different between SMS PDU Mode and SMS Text Mode, as explained below.
(PDU Mode) **AT+CNMA[=<n>[,<length>[<CR>PDU is given<ctrl-Z/ESC]]]**	Either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network is possible. Parameter **<n>** defines which one will be sent. Optionally (when **<length>** is greater than zero) an acknowledgement TPDU (SMS-DELIVER-REPORT for RP-ACK or RP-ERROR) may be sent to the network. The entering of PDU is done similarly as specified in command Send Message **+CMGS**, except that the SMSC address field is not present. 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.
(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>**
(Text Mode) **AT+CNMA=?**	Test command returns the **OK** result code.
Notes	1 - In case that a directly routed message must be buffered in ME/TA (possible when **+CNMI** parameter **<mode>** equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (e.g. user is entering a message using **+CMGS**), acknowledgement (RP-ACK) is sent to the network without waiting **+CNMA** command from TE.

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+CNMA – New Message Acknowledgement	
	2 - It has been necessary to take the following decision to get over any incoherence problem, due to the possibility to have contemporaneous different settings of parameter **<mt>** and **<ds>** of the **+CNMI** command in different sessions (see #PORTCFG and +CMUX): only the **<mt>** and **<ds>** setting for session "0" are considered as valid to decide if **+CNMA** acknowledgment is expected or not.
Example	**(PDU Mode)** AT+CSMS=1 +CSMS: 1,1,1 OK *Set PDU mode.* AT+CMGF=0 OK AT+CNMI=2,2,0,0,0 OK *Message is received from network.* +CMT: "",70 0681600058542600048098060 0F1701103705372 84… *Send positive acknowledgement to the network.* AT+CNMA=0 OK *Message is received from network.* +CMT: "",70 0681600058542600048098060 0F1701103705372 84… *Send negative acknowledgment (Unspecified error) to the network.* AT+CNMA=2,3<CR> > 00FF00 <Ctrl-Z> OK **(Text Mode)** AT+CSMS=1 +CSMS: 1,1,1 OK *Set Text mode.* AT+CMGF=1 OK

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

5.1.5.3.3. List Messages - +CMGL

+CMGL - List Messages	SELINT 2
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. If there is at least one message to be listed the representation format is: **+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[<CR><LF>** **+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[...]]** where: **<index>** - message position in the memory storage list. **<stat>** - status of the message **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command **+CSCS**. **<length>** - length of the PDU in bytes **<pdu>** - message in PDU format according to 3GPP TS 23.040

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+CMGL - List Messages	SELINT 2

(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.

The representation format for stored messages (either sent or unsent) or received messages (either read or unread, not message delivery confirm) is (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>[<CR><LF>**
+CMGL: <index>,<stat>,<oa/da>,<alpha>,<scts>*[,<tooa/toda>,*
***<length>]*<CR><LF><data>[...]]**

where:

<index> - message position in the storage
<stat> - message status
<oa/da> - originator/destination address, string type , represented in the currently selected character set (see **+CSCS**)
<alpha> - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command **+CSCS**.
<scts> - TP-Service Centre Time Stamp in Time String Format
<tooa/toda> - type of number **<oa/da>**
129 - number in national format
145 - number in international format (contains the "+")
<length> - text length
<data> - TP-User-Data

- If **<dcs>** indicates that GSM03.38 default alphabet is used , each character of GSM 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)
- If <fo> indicates that a UDH is present each 8-bit octet will be converted into two IRA character long hexadecimal number. The <length> indicates text length in characters without UDH length.

If there is at least one message delivery confirm to be listed the representation format is:

+CMGL - List Messages	SELINT 2
	+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> **[<CR><LF>** **+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>** **[...]]** where **<index>** - message position in the storage **<stat>** - message status **<fo>** - first octet of the message PDU **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format **<ra>** - recipient address, string type , represented in the currently selected character set (see **+CSCS**) **<tora>** - type of number <ra> **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU Note: If parameter is omitted the command returns the list of sms with "**REC UNREAD**" status. Note: the order in which the messages are reported by **+CMGL** corresponds to their position in the memory storage
AT+CMGL=?	Test command returns a list of supported **<stat>**s
Reference	3GPP TS 27.005, 3GPP TS 23.040

5.1.5.3.4. Read Message - +CMGR

+CMGR - Read Message	SELINT 2
AT+CMGR=<index>	Execution command reports the message with location value **<index>** from **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command **+CPMS**). Parameter: **<index>** - message index. The output depends on the last settings of command **+CMGF** (message format to be used) **(PDU Mode)** If there is a message in location **<index>**, the output has the following format: **+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>** where

+CMGR - Read Message	SELINT 2
	<stat> - status of the message 0 - new message 1 - read message 2 - stored message not yet sent 3 - stored message already sent **<alpha>** - string type alphanumeric representation of **<da>** or **<oa>**, corresponding to an entry found in the phonebook; used character set is the one selected with command **+CSCS**. **<length>** - length of the PDU in bytes. **<pdu>** - message in PDU format according to 3GPP TS 23.040. The status of the message and entire message data unit **<pdu>** is returned. **(Text Mode)** If there is a **Received** message in location **<index>** the output format is (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>** If there is either a **Sent** or an **Unsent** message in location **<index>** the output format is: **+CMGR: <stat>,<da>,<alpha>*[,<toda>,<fo>,<pid>,<dcs>,[<vp>],*** ***<sca>,<tosca>,<length>]*<CR><LF><data>** If there is a **Message Delivery Confirm** in location **<index>** the output format is: **+CMGR: <stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>** where: **<stat>** - status of the message "REC UNREAD" - new received message unread "REC READ" - received message read "STO UNSENT" - message stored not yet sent "STO SENT" - message stored already sent ***<fo>*** - first octet of the message PDU **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format **<ra>** - recipient address, string type, represented in the currently selected character set (see **+CSCS**) **<tora>** - type of number **<ra>** **<scts>** - arrival time of the message to the SC **<dt>** - sending time of the message **<st>** - message status as coded in the PDU ***<pid>*** - Protocol Identifier ***<dcs>*** - Data Coding Scheme **<vp>** - Validity Period; its format depends on SMS-SUBMIT **<fo>** setting (see **+CSMP**):

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+CMGR - Read Message	**SELINT 2**
	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*** 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 default alphabet is used , each character of GSM 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
Reference	3GPP TS 27.005

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5.1.5.4. Message Sending And Writing

5.1.5.4.1. Send Message - +CMGS

+CMGS - Send Message	**SELINT 2**
(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: **+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. Note: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.

+CMGS - Send Message	**SELINT 2**
(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 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 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used; after every **<CR>** entered by the user the sequence **<CR><LF><greather_than><space>** is sent to the TE. - if current **<dcs>** (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) Note: the **DCD** signal shall be in **ON** state while text is entered. Note: the echoing of entered characters back from the TA is controlled by echo command **E** To send the message issue **Ctrl-Z** char (**0x1A** hex). To exit without sending the message issue **ESC** char (**0x1B** hex). If message is successfully sent to the network, then the result is sent in the format: **+CMGS: <mr>** where **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format.

+CMGS - Send Message	SELINT 2
	Note: if message sending fails for some reason, an error code is reported. Note: care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued. Note: it is possible to send a concatenation of at most 10 SMs; the maximum number of chars depends on the **<dcs>**: 1520 chars if 3GPP TS 23.038 default alphabet is used, 1330 chars if 8-bit is used, 660 chars if UCS2 is used. If entered text is longer than this maximum value an error is raised
AT+CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Reference	3GPP TS 27.005

5.1.5.4.2. Send Message From Storage - +CMSS

+CMSS - Send Message From Storage	SELINT 2
AT+CMSS= <index>[,<da> [,<toda>]]	Execution command sends to the network a message which is already stored in the **<memw>** storage (see **+CPMS**) at the location **<index>**. Parameters: **<index>** - location value in the message storage **<memw>** of the message to send **<da>** - destination address, string type represented in the currently selected character set (see **+CSCS**); if it is given it shall be used instead of the one stored with the message. **<toda>** - type of destination address 129 - number in national format 145 - number in international format (contains the "+") If message is successfully sent to the network then the result is sent in the format: **+CMSS: <mr>** where: **<mr>** - message reference number. 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.

+CMSS - Send Message From Storage	SELINT 2
Note	To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.
Reference	3GPP TS 27.005

5.1.5.4.3. Write Message To Memory - +CMGW

+CMGW - Write Message To Memory	SELINT 2
(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 (received unread message; default for DELIVER messages (3GPP TS 23.040 SMS-DELIVER messages)) 1 - read message 2 - stored message not yet sent (default for SUBMIT messages(3GPP TS 23.040 SMS-SUBMIT messages)) 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. Note: in PDU mode, not only SUBMIT messages can be stored in SIM, but also DELIVER and STATUS REPORT messages (3GPP TS 23.040 SMS-STATUS-REPORT messages). SUBMIT messages can only be stored with status 2 or 3; DELIVER and STATUS REPORT messages can only be stored with status 0 or 1.

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+CMGW - Write Message To Memory	SELINT 2
(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 (default for DELIVER messages) "REC READ" - received message read "STO UNSENT" - message stored not yet sent (default for SUBMIT messages) "STO SENT" - message stored already sent After command line is terminated with **<CR>**, the device responds sending a four character sequence prompt: **<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)** After this prompt text can be entered; the entered text should be formatted as follows: - if current **<dcs>** (see **+CSMP**) indicates that 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 3GPP TS 27.005, Annex A; **backspace** can be used to delete last character and **carriage returns** can be used; after every **<CR>** entered by the user the sequence **<CR><LF><greather_than><space>** is sent to the TE. - if current **<dcs>** (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) Note: the **DCD** signal shall be in ON state while text is entered. Note: the echoing of entered characters back from the TA is controlled by echo command **E** To write the message issue **Ctrl-Z** char (**0x1A** hex). To exit without writing the message issue **ESC** char (**0x1B** hex).

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+CMGW - Write Message To Memory	SELINT 2
	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 23.038 default alphabet is used, 1340 chars if 8-bit is used, 670 chars if UCS2 is used. If entered text is longer than this maximum value an error is raised. Note: in text mode, not only SUBMIT messages can be stored in SIM, but also DELIVER messages. The type of saved message depends upon the current <fo> parameter (see **+CSMP**). For a DELIVER message, current <vp> parameter (see **+CSMP**) is used to set the message Service Centre Time Stamp <scts>, so it has to be an absolute time string, e.g. "09/01/12,11:15:00+04". SUBMIT messages can only be stored with status "STO UNSENT" or "STO SENT"; DELIVER messages can only be stored with status "REC UNREAD" or "REC READ".
AT+CMGW=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.005
Note	To avoid malfunctions is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

5.1.5.4.4. Delete Message - +CMGD

+CMGD - Delete Message	SELINT 2
AT+CMGD=<index>[,<delflag>]	Execution command deletes from memory **<memr>** the message(s). Parameter: **<index>** - message index in the selected storage **<memr>** that can have values form 1 to N, where N depends on the available space (see **+CPMS**) **<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

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+CMGD - Delete Message	SELINT 2
	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, if <index> is greater than 0, **<index>** is ignored and ME shall follow the rules for **<delflag>** shown above.
AT+CMGD=?	Test command shows the valid memory locations and optionally the supported values of **<delflag>**. **+CMGD: (supported <index>s list)[,(supported <delflag>s list)]**
Example	AT+CMGD=? +CMGD: (1,2,3,6,7,17,18,19,20,37,38,39,47),(0-4) OK
Reference	3GPP TS 27.005

5.1.5.4.5. Select service for MO SMS messages - +CGSMS

+CGSMS – Select service for MO SMS messages	SELINT 2
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. **<service>:** a numeric parameter which indicates the service or service preference to be used 0 - GPRS 1 - circuit switched (default) 2 - GPRS preferred (use circuit switched if SMS via GPRS service not available or GPRS not registered) 3 - circuit switched preferred (use GPRS if SMS via GSM service not available or GSM not registered) Note: the <service> value is saved on NVM as global parameter
AT+CGSMS?	The read command returns the currently selected service or service preference in the form: **+CGSMS: <service>**
AT+CGSMS=?	Test command reports the supported list of currently available <service>s.

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5.1.6. Custom AT Commands

5.1.6.1. General Configuration AT Commands

5.1.6.1.1. Hang Up Call - #CHUP

#CHUP - Hang Up Call	SELINT 2
AT#CHUP	Execution command ends all active and held calls, also if a multi-party session is running. It also allows disconnecting of a data call from a CMUX instance different from the one that was used to start the data call.
AT#CHUP=?	Test command returns the **OK** result code

5.1.6.1.2. USB configuration - #USBCFG

#USBCFG- USB Configuration	SELINT 2
AT#USBCFG=<mode>	Set command specify USB configuration on the modem device. New configuration mode applied at the next boot up time. Parameter: **<mode>** - USB configuration mode 0 – All the USB ports (Telit Mobile (USBx) are in ACM mode; Selective Suspend is disabled; ECM is disabled; DLINK feature is disabled; VID 0x1BC7 PID 0x0021 **(default value)** 1 – All the USB ports (Telit Mobile (USBx) are in ACM Data Only mode (2 endpoints for each port); Selective Suspend is disabled; ECM is disabled; DLINK feature is enabled; VID 0x1BC7 PID 0x0026 2 – All the USB ports (Telit Mobile (USBx) are in ACM mode; Selective Suspend is disabled; ECM is disabled; DLINK feature is enabled; VID 0x1BC7 PID 0x0021 3 – All the USB ports (Telit Mobile (USBx) are in ACM mode; Selective Suspend is disabled; ECM is enabled; DLINK feature is disabled; VID 0x1BC7 PID 0x0023 4 – All the USB ports (Telit Mobile (USBx) are in ACM mode; Selective Suspend is enabled; ECM is disabled; DLINK feature is disabled; VID 0x1BC7 PID 0x0024 5 – All the USB ports (Telit Mobile (USBx) are in ACM mode;

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	Selective Suspend is enabled; ECM is enabled; DLINK feature is disabled; VID 0x1BC7 PID 0x0023 Note: the modem device doesn't reset automatically; use AT#REBOOT or a complete power cycle. Note: the default value depends on the software version Note: to learn more about DLINK feature, read AT#DLINK description

Mode	Ports	SS	ECM	DLINK	VID	PID
0	ACM	NO	NO	NO	0x1BC7	0x0021
1	ACM Data Only	NO	NO	YES	0x1BC7	0x0026
2	ACM	NO	NO	YES	0x1BC7	0x0021
3	ACM	NO	YES	NO	0x1BC7	0x0023
4	ACM	YES	NO	NO	0x1BC7	0x0024
5	ACM	YES	YES	NO	0x1BC7	0x0025

AT#USBCFG?	Read command shows the current <mode> in the following format #USBCFG: <mode>
AT#USBCFG=?	Test command returns the list of supported values.

5.1.6.1.3. Connect physical ports to Service Access Points - #PORTCFG

#PORTCFG – connect physical ports to Service Access Points	**SELINT 2**
AT#PORTCFG=<Variant>	**AT#PORTCFG** command allows to connect Service Access Points (software anchorage points) to the external physical ports giving a great flexibility. Examples of Service Access Points: AT Parser Instance #1,#2, #3, TT(Telit Trace), 3G(Trace). <**Variant**> parameter range: 0 ÷ 12; factory setting: 1. Please, refer to "HE Family Ports Arrangements User Guide" document for a detailed explanation of all port configurations Note: in order to enable the set port configuration, the module has to be rebooted.
AT#PORTCFG?	Read command reports: <**requested**> value shows the requested configuration that will be activated on the next power off /on of the

	module; **<active>** value shows the actual configuration. **#PORTCFG: <requested>,<active>**
AT#PORTCFG=?	Test command reports a brief description of the supported ports arrangement solutions. For each **<Variant>** parameter value are displayed, on one row, the allowed couples formed by: a physical port and the logically connected internal software Access Point (AT, TT). On each row are reported the couples concerning both configurations: USB cable plugged into USB port or not plugged in. AT, indicated on each command row result, can be AT0, AT1, or AT2.

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5.1.6.1.4. Data Link - #DLINK

#DLINK – Data Link	SELINT 2
AT#DLINK=<act>,<urc_mode>	Set command establishes or terminates data link channel between the Telit Mobile (USB5) and the first logic cmux channel DLCI_1. Parameters: <act> - Data Link Action 0 – Terminate Data Link Channel 1 – Establish Data Link Channel <urc_mode> - URC mode 0 – Disable URC message about Data Link status 1 – Enable URC message about Data Link status If <urc_mode>=1 , Data link status reported as followings #DLINK: <status> <status> 0 : Data Link disconnected 1 : Data Link connected Note: this command required #PORTCFG=12 and #USBCFG=1 or #USBCFG=2; both the settings should be configured before to issue #DLINK. Note: #DLINK connects the port where it has been issued with Telit Mobile (USB5). By now this command can be issued only on DLCI_1 (first cmux logical data channel), so the cmux must be up & running. Note: Once DLCI_1 is connected with DLINK-USB successfully, DLCI_1 couldn't accept AT commands any more. "+++" escape sequence character on DLCI_1 or Telit Mobile (USB5) will terminate the data link channel; sending AT#DLINK=0 on any other port will produce the same result. Note: until the data link channel is not established the Telit Mobile (USB5) port is internally disconnected, it cannot process any kind of data (e.g. AT commands). Note: a typical configuration is DLCI_1 connected to AT parser or Telit Mobile (USB5)

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	DLCI_2 connected to AT parser Telit Mobile (USB3) connected to AT parser Telit Mobile (USB4) connected to AT parser
AT#DLINK?	Read command reports <status> and <urc_mode> parameter values in the following format: #DLINK: <status>,<urc_mode>
AT#DLINK=?	Test command returns the list of supported values.

5.1.6.1.5. Network Selection Menu Availability - +PACSP

+PACSP - Network Selection Menu Availability	**SELINT 2**
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.

5.1.6.1.6. Manufacturer Identification - #CGMI

#CGMI - Manufacturer Identification	**SELINT 2**
AT#CGMI	Execution command returns the device manufacturer identification code with command echo.
AT#CGMI=?	Test command returns the **OK** result code.

5.1.6.1.7. Model Identification - #CGMM

#CGMM - Model Identification	**SELINT 2**
AT#CGMM	Execution command returns the device model identification code with command echo.
AT#CGMM=?	Test command returns the **OK** result code.

5.1.6.1.8. Revision Identification - #CGMR

#CGMR - Revision Identification	**SELINT 2**
AT#CGMR	Execution command returns device software revision number with command echo.
AT#CGMR=?	Test command returns the **OK** result code.

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5.1.6.1.9. Product Serial Number Identification - #CGSN

#CGSN - Product Serial Number Identification	SELINT 2
AT#CGSN	Execution command returns the product serial number, identified as the IMEI of the mobile, with command echo.
AT#CGSN=?	Test command returns the **OK** result code.

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

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

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

#CIMI - International Mobile Subscriber Identity (IMSI)	SELINT 2
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.

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

#CCID - Read ICCID	SELINT 2
AT#CCID	Execution command reads on SIM the ICCID (card identification number that provides a unique identification number for the SIM)
AT#CCID=?	Test command returns the **OK** result code.

5.1.6.1.13. Service Provider Name - #SPN

#SPN - Service Provider Name	SELINT 2
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.

5.1.6.1.14. Extended Numeric Error report - #CEER

#CEER – Extended numeric error report	SELINT 2
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

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#CEER – Extended numeric error report	SELINT 2

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

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#CEER – Extended numeric error report		SELINT 2
	97	Message type non-existent or not implemented
	98	Message type not compatible with protocol state
	99	Information element non-existent or not implemented
	100	Conditional IE error
	101	Message not compatible with protocol state
	102	Recovery on timer expiry
	111	Protocol error, unspecified
	127	Interworking, unspecified
	GPRS related errors	
	224	MS requested detach
	225	NWK requested detach
	226	Unsuccessful attach cause NO SERVICE
	227	Unsuccessful attach cause NO ACCESS
	228	Unsuccessful attach cause GPRS SERVICE REFUSED
	229	PDP deactivation requested by NWK
	230	PDP deactivation cause LLC link activation Failed
	231	PDP deactivation cause NWK reactivation with same TI
	232	PDP deactivation cause GMM abort
	233	PDP deactivation cause LLC or SNDCP failure
	234	PDP unsuccessful activation cause GMM error
	235	PDP unsuccessful activation cause NWK reject
	236	PDP unsuccessful activation cause NO NSAPI available
	237	PDP unsuccessful activation cause SM refuse
	238	PDP unsuccessful activation cause MMI ignore
	239	PDP unsuccessful activation cause Nb Max Session Reach
	256	PDP unsuccessful activation cause wrong APN
	257	PDP unsuccessful activation cause unknown PDP address or type
	258	PDP unsuccessful activation cause service not supported
	259	PDP unsuccessful activation cause QOS not accepted
	260	PDP unsuccessful activation cause socket error
	Other custom values	
	240	FDN is active and number is not in FDN
	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	

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

#CEERNET – Ext error report for Network reject cause	SELINT 2

AT#CEERNET

Execution command causes the TA to return a numeric code in the format

#CEERNET: <code>

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

<code> values as follows

Value	Diagnostic
2	IMSI UNKNOWN IN HLR
3	ILLEGAL MS
4	IMSI UNKNOWN IN VISITOR LR
5	IMEI NOT ACCEPTED
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) / ~~SM N~~ NETWORK FAILURE(SM cause failure)
39	REACTIVATION REQUIRED

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#CEERNET – Ext error report for Network reject cause		SELINT 2
	40	NO PDP CTXT ACTIVATED(GMM cause failure)/ FEATURE NOT SUPPORTED(SM cause failure)
	41	SEMANTIC ERROR IN TFT OPERATION
	42	SYNTACTICAL ERROR IN TFT OPERATION
	43	UNKNOWN PDP CNTXT
	44	SEM ERR IN PKT FILTER
	45	SYNT ERR IN PKT FILTER
	46	PDP CNTXT WITHOUT TFT ACTIVATED
	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	

5.1.6.1.16. Display PIN Counter - #PCT

#PCT - Display PIN Counter		SELINT 2
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.	

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5.1.6.1.17. Software Shut Down - #SHDN

#SHDN - Software Shutdown	SELINT 2
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**.
AT#SHDN=?	Test command returns the OK result code.

5.1.6.1.18. Extended Reset - #Z

#Z – Extended reset	SELINT 2
AT#Z=<profile>	Set command loads both base section and extended section of the specified user profile stored with AT&W and selected with AT&P. Parameter **<profile>** 0 – user profile 0 1 – user profile 1
AT#Z=?	Test command tests for command existence.

5.1.6.1.19. Periodic Reset - #ENHRST

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

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#ENHRST – Periodic ReseT	SELINT 2
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 …. Module reboots now … AT#ENHRST=2,60 …. Module reboots after 60 minutes and indefinitely after every following power on …

5.1.6.1.20. Wake From Alarm Mode - #WAKE

#WAKE - Wake From Alarm Mode	SELINT 2
AT#WAKE= [<opmode>]	Execution command stops any eventually present alarm activity and, if the module is in **alarm mode**, it exits the **alarm mode** and enters the **normal operating mode**. Parameter: **<opmode>** - operating mode 0 - normal operating mode; the module exits the **alarm mode**, enters the **normal operating mode**, any alarm activity is stopped (e.g. alarm tone playing) and an **OK** result code is returned. Note: the **alarm mode** is indicated by status **ON** of hardware pin **CTS** and by status **ON** of pin **DSR**; the **power saving** status is indicated by a **CTS - OFF** and **DSR - OFF** status; the **normal operating status** is indicated by **DSR - ON**. Note: during the **alarm mode** the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SM, the only commands that can be issued to the MODULE in this state are the **#WAKE** and **#SHDN**, every other command must not be issued during this state.

#WAKE - Wake From Alarm Mode	SELINT 2
	Note: if **#WAKE=0** command is issued after an alarm has been set with **+CALA** command, but before the alarm has expired, it will answer **OK** but have no effect.
AT#WAKE?	Read command returns the **operating status** of the device in the format: **#WAKE: <status>** where: **<status>** 0 - normal operating mode 1 - alarm mode or normal operating mode with some alarm activity.
AT#WAKE=?	Test command returns **OK** result code.

5.1.6.1.21. Temperature Monitor - #TEMPMON

#TEMPMON - Temperature Monitor	SELINT 2
AT#TEMPMON= <mod> [,<urcmode> [,<action> [,<hyst_time> [,<GPIO>]]]]	Set command sets the behaviour 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. 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 an 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..7 - as a sum of: 0 - no action 1 - automatic shut-down when the temperature is beyond the extreme bounds 2 - RF RX and TX circuits automatically disabled (using **+CFUN=4**) when operating temperature bounds are reached. When the temperature is back to normal the module is brought back to the previous state, before RF RX and TX disabled. 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. **<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 **<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 required. Note: the URC presentation mode **<urcmode>** is related to the current AT instance only (see **+cmux**); last **<urcmode>** settings are saved for every instance as extended profile parameters, thus it is possible to restore them either if the multiplexer control channel is released and set up, back and forth. Note: in case that action 4 is set, the chosen GPIO has to be configured in alternate function ALT3 through AT#GPIO command Note: last **<action>**, **<hyst_time>** and **<GPIO>** settings are saved in NVM too, but they are not related to the current CMUX instance only (see **+cmux**).
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	The following table is describing the temperature levels.

Extreme Temperature Lower Bound	-30°C
Operating Temperature Lower Bound	-10°C
Operating Temperature	
Operating Temperature Upper Bound	55°C
Extreme Temperature Upper Bound	80°C

5.1.6.1.22. Temperature monitor configuration - #TEMPCFG

#TEMPCFG – Temperature monitor configuration	**SELINT 2**
AT#TEMPCFG= **<TempExLowBound>** **[,<TempOpLowBound>** **[,<TempOpUpBound>** **[,<TempExUpBound>]]]**	This parameter command manages the temperature range used by the TEMPMON command Parameters: **<TempExLowBound>** - the extreme temperature lower limit **<TempOpLowBound>** - the operating temperature lower limit **<TempOpUpBound>** - the operating temperature upper limit **<TempExUpBound>** - the extreme temperature upper limit Note 1: The extreme temperature lower limit must not be lower than lower limit (see TEMPMON for temperature limits); Note 2: the operating temperature lower limit must be bigger than the extreme temperature lower limit, and not lower than its minimum admitted value (see TEMPMON for temperature limits); Note 3: the operating temperature upper limit must be bigger than the operating temperature lower limit, and not lower than its minimum admitted value (see TEMPMON for temperature limits); Note 4: the extreme temperature upper limit must be bigger than the operating temperature upper limit

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	Note 5: The extreme temperature upper limit must be lower than its upper limit (see TEMPMON for temperature limits). Note 5: the temperature correctly set are saved in NvM, so at the next reboot the last temperature set is active instead of the factory default values. Note 6: a factory reset restores the factory default values.
AT#TEMPCFG?	read the currently active temperature range : **#TEMPCFG: <TempExLowBound>,** **<TempOpLowBound>,** **<TempOpUpBound>,** **<TempExUpBound>**
AT#TEMPCFG=?	Test command returns the supported range of **<TempExLowBound>,** **<TempOpLowBound>,** **<TempOpUpBound>,** **<TempExUpBound>** parameters**.**

Example	//test the currently set values
	AT#TEMPCFG?
	#TEMPCFG: -30,-10,55,80
	
	OK
	
	//set a new temperature range
	AT#TEMPCFG=-40,-15,55,85
	OK
	
	//read the currently set values
	AT#TEMPCFG?
	#TEMPCFG: -40,-15,55,85
	
	OK

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

#GPIO - General Purpose Input/Output Pin Control	**SELINT 2**
AT#GPIO=[<pin>, <mode>[,<dir>[,<save>]]]	Execution command sets the value of the general purpose output pin **GPIO<pin>** according to **<dir>** and **<mode>** parameter. Not all configurations for the three parameters are valid. Parameters:

#GPIO - General Purpose Input/Output Pin Control	SELINT 2

<pin> - GPIO pin number; supported range is from 1 to a value that depends on the hardware.

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

0 - if **<dir>=0** – INPUT, remove any Pull-up/Pull-down
- output pin cleared to 0 (**Low**) if **<dir>=1** - OUTPUT
- no meaning if **<dir>=2** - ALTERNATE FUNCTION
- no meaning if **<dir>=3** – TRISTATE PULL DOWN

1 - if **<dir>=0** – INPUT, if **<dir>=0** – INPUT, remove any Pull-up/Pull-down
- output pin set to 1 (**High**) if **<dir>=1** - OUTPUT
- no meaning if **<dir>=2** - ALTERNATE FUNCTION
- no meaning if **<dir>=3** – TRISTATE PULL DOWN

2 - Reports the read value from the input pin if **<dir>=0** - INPUT
- Reports the read value from the input pin if **<dir>=1** - OUTPUT
- Reports a no meaning value if **<dir>=2** - ALTERNATE FUNCTION

3 - if **<dir>=0** – INPUT, enable Pull-Up

4 - if **<dir>=0** – INPUT, enable Pull-Down

<dir> - GPIO pin direction

0 - pin direction is INPUT

1 - pin direction is OUTPUT

2,3,4,5,6 - 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 or Tristate pull down

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#GPIO - General Purpose Input/Output Pin Control	SELINT 2

Note: "ALT1" value is valid only for the following pins and with the specified function

	UE910	HE910	UL865	UE866
GPIO_01	Stat Led	Stat Led	DVI_WA0	DVI_WA0
GPIO_02			DVI_RX	DVI_RX
GPIO_03			DVI_TX	DVI_TX
GPIO_04			DVI_CLK	DVI_CLK
GPIO_05	-	-	-	-
GPIO_06	-	-	SPI_SRDY	-
GPIO_07	DAC	DAC	SPI_MRDY	Stat Led
GPIO_08	-	-	Stat Led	
GPIO_09	-	-		
GPIO_10	-	-		

"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
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

If <mode> = 3,4 the ouput format is
#GPIO:<dir>,<stat>,<mode>[<CR><LF>#GPIO:<dir>,<stat>,<mode>[…]]

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

5.1.6.1.24. SIMIN pin configuration - #SIMINCFG

#SIMINCFG – SIMIN pin configuration	SELINT 2
AT#SIMINCFG= <GPIO_pin>, <Simin_det_mode>	This command allows to configure a General Purpose I/O pin as SIM DETECT input and to set Simin pin status for SIM detection Parameters: **<GPIO_pin>** - GPIO pin number: 0 – no GPIO pin is selected (default value) X – GPIO_x as specified in Test Command **<Simin_det_mode>** - status of Simin pin for sim detection: 0 – Simin pin to ground means SIM inserted, to Vcc means SIM removed, for normal sim holder 1 – Simin pin to ground means SIM removed, to Vcc means SIM inserted, for micro sim holder Note:for each product only a few GPIOs can be configured as SIMIN. Note: first parameter makes sense only for UL865 and UE866 families.
AT#SIMINCFG?	Read command reports the selected GPIO pin in the format: #SIMINCFG: <**GPIO_pin**>, <**Simin_det_mode**>
AT#SIMINCFG=?	Test command reports supported range of values for parameter <**GPIO_pin**> and <**Simin_det_mode**>

5.1.6.1.25. Alarm Pin - #ALARMPIN

#ALARMPIN – Alarm Pin	SELINT 2
AT#ALARMPIN=	Set command sets the GPIO pin for the ALARM pin

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<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>**.

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5.1.6.1.26. STAT_LED GPIO Setting - #SLED

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

5.1.6.1.27. Save STAT_LED GPIO Setting - #SLEDSAV

#SLEDSAV - Save STAT_LED GPIO Setting		SELINT 2
AT#SLEDSAV	Execution command saves **STAT_LED** setting in NVM.	
AT#SLED=?	Test command returns **OK** result code.	

5.1.6.1.28. SMS Ring Indicator - #E2SMSRI

#E2SMSRI - SMS Ring Indicator		SELINT 2
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 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>**	

5.1.6.1.29. Event Ring Indicator - #E2RI

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

	2 – Socket Listen (same as **AT#E2SLRI=<duration>**) 4 – OTA firmware upgrade (same as **AT#OTASETRI=<duration>**) 8 – MT SMS has been received (same as **AT#E2SMSRI=<duration>**) 10 – +CREG will change status 20 – +CGREG will change status 40 – #QSS become 2 (SIM INSERTED and PIN UNLOCKED) 80 – MO SMS has been delivered 100 – Jamming Detection & Reporting (JDR) The hexadecimal number is actually a bit mask, where each bit, when set/not set, indicates that the corresponding event has been enabled/disabled. **<duration>** : 50..1150 - the duration in ms of the pulse generated Note: The values set by the command are stored in the profile extended section and they don't depend on the specific AT instance. Note: Enabling JDR event when the Enhanced Jamming Detection & Reporting feature has been previously enabled (see #JDRE and #JDRENH)
AT#E2RI?	Read command reports a line for each event and the duration in ms of the pulse generated, in the format: **#E2RI: <event_mask>,<duration>**
AT#E2RI=?	Test command returns supported values ofparameters <event_mask> and <duration>

5.1.6.1.30. Read Analog/Digital Converter input - #ADC

#ADC - Read Analog/Digital Converter input	SELINT 2
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 For the number of available ADCs see HW User Guide **<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>**.

5.1.6.1.31. V24 Output Pins Configuration - #V24CFG

#V24CFG - V24 Output Pins Configuration	SELINT 2
AT#V24CFG=<pin>,<mode>[,<save>]	Set command sets the AT commands serial port interface output pins mode. Parameters: **<pin>** - AT commands serial port interface hardware pin: 0 – **DCD** (Data Carrier Detect) 1 – **CTS** (Clear To Send) 2 – **RI** (Ring Indicator) 3 – **DSR** (Data Set Ready) 4 – **DTR** (Data Terminal Ready). This is not an output pin, so its state cannot be set through the **AT#V24** command. 5 – **RTS** (Request To Send). This is not an output pin, so its state cannot be set through the **AT#V24** command. **<mode>** - AT commands serial port interface hardware pins mode: 0 – AT commands serial port mode: the V24 pins are controlled by the serial port device driver (default)

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#V24CFG - V24 Output Pins Configuration	SELINT 2
	1 – GPIO mode: the V24 output pins can be managed through the **AT#V24** command **<save>** - Save V24 pin configuration: 0 – Pin configuration is not saved 1 – Pin configuration is saved Note: when **<mode>=1,** the V24 pins, both output and input, can be set to control an external GNSS receiver through the **AT$GPSGPIO** command. Note: when the **<save>** parameter is omitted, the pin configuration is NOT stored. Note: changing V24 pins configuration may affect the cellular module functionality set through **AT+CFUN**.
AT#V24CFG?	Read command returns the current configuration for all the pins (both output and input) 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>**, **<mode>** **and <save>**.

5.1.6.1.32. V24 Output Pins Control - #V24

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

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#V24 - V24 Output Pins Control	SELINT 2
	0 - Low 1 - High Note: if **<state>** is omitted the command returns the actual state of the pin **<pin>**.
AT#V24?	Read command returns actual state for all the pins (either output and input) in the format: **#V24: <pin1>,<state1>[<CR><LF>** **#V24: <pin2>,<state2>[...]]** where **<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>**.

5.1.6.1.33. Battery and charger status - #CBC

#CBC- Battery And Charger Status	SELINT 2
AT#CBC	Execution command returns the current Battery and Charger state in the format: **#CBC: <ChargerState>,<BatteryVoltage>** where: **<ChargerState>** - battery charger state 0 - charger not connected 1 - charger connected and charging 2 - charger connected and charge completed **<BatteryVoltage>** - battery voltage in units of ten millivolts: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage.
AT#CBC=?	Test command returns the **OK** result code.

5.1.6.1.34. GPRS Auto-Attach Property - #AUTOATT

#AUTOATT - Auto-Attach Property	SELINT 2
AT#AUTOATT= [<auto>]	Set command enables/disables the TE GPRS auto-attach property. Parameter: **<auto>**

#AUTOATT - Auto-Attach Property	SELINT 2
	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>**.

5.1.6.1.35. Multislot Class Control - #MSCLASS

#MSCLASS - Multislot Class Control	SELINT 2
AT#MSCLASS=[<class>[,<autoattach>]]	Set command sets the multislot class Parameters: **<class>** - multislot class; take care: class 7 is not supported. (1-12),(30-33),(35-38) - GPRS (EGPRS) class Factory default: HE910-NAx --> class 10 by default UE910-Nax --> class 10 by default HE910-GA --> class 10 by default HE910-G --> class 10 by default HE910-D --> class 10 by default HE910-DG --> class 10 by default HE910_EUx --> class 33 by default UE910_EUx --> class 33 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. 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>**.

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5.1.6.1.36. Cell Monitor - #MONI

#MONI - Cell Monitor	SELINT 2
AT#MONI[= [<number>]]	**#MONI** is both a set and an execution command. Set command sets one cell out of seven, in the neighbour list of the serving cell including it, from which extract GSM /UMTS-related information. Parameter: **<number>** **(GSM network)** 0..6 - it is the ordinal number of the cell, in the neighbour list of the serving cell (default 0, serving cell). 7 - it is a special request to obtain GSM-related information from the whole set of seven cells in the neighbour list of the serving cell. **(UMTS network)** **0** – it is the serving cell in idle; Active set cells are also reported in CELL_DCH state, i.e. during a call (default) **1** – it is the candidate set (cells that belong to the Active set, only reported in CELL_DCH state, i.e. during a call) **2** – it is the synchronized neighbour set (cells that belong to the Virtual Active set, only reported in CELL_DCH state, i.e. during a call) **3** – it is the asynchronized neighbour set (cells which are not suitable cells to camp on) **4** – it is the ranked neighbour set (cells which are suitable cells to camp on) **7** - it is a special request to obtain information from the whole set of detected cells in the neighbour list of the serving cell. **5..6** – it is not available Execution command (**AT#MONI<CR>**) reports GSM/UMTS-related information for selected cell and dedicated channel (if exists). 1. If the last setting done by **#MONI** is in the range **[0..6]**, the output format is as follows: a)When extracting data for the serving cell and the network name is known the format is: **(GSM network)** **#MONI: <netname> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>** **(UMTS network)** **#MONI: <netname> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id>EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>**

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#MONI - Cell Monitor	SELINT 2

b)When the network name is unknown, the format is:

(GSM network)

#MONI: <cc> <nc> BSIC:<bsic> RxQual:<qual> LAC:<lac> Id:<id> ARFCN:<arfcn> PWR:<dBm> dBm TA: <timadv>

(UMTS network)

#MONI: <cc> <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 (or active set cell), the format is:

(GSM network)

#MONI: Adj Cell<n> [LAC:<lac> Id:<id>] ARFCN:<arfcn> PWR:<dBm> dBm

(UMTS 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

<arfcn> - assigned radio channel

<dBm> - received signal strength in dBm; for serving cell in UMTS network this is not available during a call, and is displayed as 0

<timadv> - timing advance

<psc> - Primary Scrambling Code

<rscp> - Received Signal Code Power in dBm; for serving cell this is not available during a call, and is displayed as 255

<ecio> - chip energy per total wideband power in dBm; for serving cell this is not available during a call, and is displayed as 255

<uarfcn> - UMTS assigned radio channel

<drx> - Discontinuous reception cycle length

<scr> - Scrambling code

Note: TA: **<timadv>** is reported only for the serving cell.

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

(GSM network)

a. First row reports the identifying name of the ‘columns’

#MONI - Cell Monitor	SELINT 2
	#MONI: **Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PL MN<CR><LF>** b. Second row reports a complete set of GSM-related information for the serving cell: **#MONI:** **S: <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value> <ti madv> <qual> <netname><CR><LF>** c. 3rd to 8th rows report a reduced set of GSM-related information for the cells in the neighbours: **#MONI:** **N<n> <bsic> <lac> <id> <arfcn> <dBm> <C1value> <C2value>[<CR><LF>]** where: **<C1value>** - C1 reselection parameter **<C2value>** - C2 reselection parameter other parameters as before **(UMTS network)** a. First row reports a set of information for the serving cell: **#MONI: <netname> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id>EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm> dBm DRX:<drx> SCR:<scr>** b. the other rows report a set of information for all detected neighbour cells: **#MONI: PSC:<psc> RSCP:<rscp> EcIo:<ecio> UARFCN:<uarfcn> SCR:<scr>** See above for parameters description.
AT#MONI=?	Test command reports the maximum number of cells, in the neighbour list of the serving cell excluding it, from which we can extract GSM/UMTS-related information, along with the ordinal number of the current selected cell, in the format: **#MONI: (<MaxCellNo>,<CellSet>)** where: **<MaxCellNo>** - maximum number of cells, in the neighbour list of the serving cell and excluding it, from which we can extract GSM-related information. This value is always **6**.

#MONI - Cell Monitor	SELINT 2
	<CellSet> - the last setting done with command **#MONI**.
Examples	*Set command selects the cell 0 in GSM network* at#moni=0 OK *Execution command reports GSM-related information for cell 0* at#moni #MONI: I WIND BSIC:70 RxQual:0 LAC:55FA Id:1D23 ARFCN:736 PWR:-83dbm TA:1 *Set command selects the cell 0 in UMTS network* at#moni=0 OK *Execution command reports UMTS-related information for serving cell and active cell* at#moni #MONI: I TIM PSC:65535 RSCP:255 LAC:EF8D Id:52D2388 EcIo:255 UARFCN:65535 PWR:0dbm DRX:128 SCR:0 #MONI: PSC:49 RSCP:-96 EcIo:-2.0 UARFCN:10638 SCR:784 OK *Set command selects the special request to obtain GSM-related information from the whole set of seven cells in the neighbour list of the serving cell* at#moni=7 OK *Execution command reports the requested information in table-like format* at#moni #MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN #MONI: S 70 55FA 1D23 736 -83dbm 19 33 1 0 I WIND #MONI: N1 75 55FA 1297 983 -78dbm 26 20 #MONI: N2 72 55FA 1289 976 -82dbm 22 16 #MONI: N3 70 55FA 1D15 749 -92dbm 10 18 #MONI: N4 72 55FA 1D0D 751 -92dbm 10 18 #MONI: N5 75 55FA 1296 978 -95dbm 9 3 #MONI: N6 70 55FA 1D77 756 -99dbm 3 11 OK
Note	The timing advance value is meaningful only during calls or GPRS transfers active.
Note	The serving cell is the current serving cell or the last available serving cell, if the module loses coverage.

5.1.6.1.37. Compressed Cell Monitor - #MONIZIP

#MONIZIP – Compressed Cell Monitor	SELINT 2
AT#MONIZIP[=[<number>]]	#MONIZIP is both a set and an execution command. Set command sets one cell out of seven, in ~~a~~ the neighbour list of the

#MONIZIP – Compressed Cell Monitor	SELINT 2

serving cell including it, from which extract GSM/UMTS-related information.

Parameter:

<number>

(GSM network)

0..6 - it is the ordinal number of the cell, in ~~a~~the neighbour list of the serving cell (default 0, serving cell).

7 - it is a special request to obtain GSM-related information from the whole set of seven cells in the neighbour list of the serving cell.

(UMTS network)

0 – it is the serving cell in idle; Active set cells are also reported in CELL_DCH state, i.e. during a call (default)

1 – it is the candidate set (cells that belong to the Active set, only reported in CELL_DCH state, i.e. during a call)

2 – it is the synchronized neighbour set (cells that belong to the Virtual Active set, only reported in CELL_DCH state, i.e. during a call)

3 – it is the asynchronized neighbour set (cells which are not suitable cells to camp on)

4 – it is the ranked neighbour set (cells which are suitable cells to camp on)

7 - it is a special request to obtain information from the whole set of detected cells in the neighbour list of the serving cell.

5..6 – it is not available

Execution command (AT#MONIZIP<CR>) reports GSM/UMTS-related information for selected cell and dedicated channel (if exists).

1. If the last setting done by #MONIZIP is in the range [0..6], the output format is as follows:

d)When extracting data for the serving cell the format is:

(GSM network)

#MONIZIP: <cc><nc>,<bsic>,<qual>,<lac>,<id>,<arfcn>, <dBm>, <timadv>

(UMTS network)

#MONIZIP: <cc><nc>,<psc>,<rscp>,<lac>,<id>, <ecio>, <uarfcn>,<dBm>,<drx>,<scr>

#MONIZIP – Compressed Cell Monitor	SELINT 2

e)When extracting data for an adjacent cell (or active set cell), the format is:

(GSM network)

#MONIZIP: <lac>,<id>,<arfcn>,<dBm>

(UMTS network)

#MONIZIP: <psc>,<rscp>,<ecio>,<uarfcn>,<scr>

where:

<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

<arfcn> - assigned radio channel

<dBm> - received signal strength in dBm

<timadv> - timing advance

<psc> - Primary Scrambling Code

<rscp> - Received Signal Code Power in dBm; for serving cell this is not available during a call, and is displayed as 255

<ecio> - chip energy per total wideband power in dBm; for serving cell this is not available during a call, and is displayed as 255

<uarfcn> - UMTS assigned radio channel

<drx> - Discontinuous reception cycle length

<scr> - Scrambling code

Note: TA: **<timadv>** is reported only for the serving cell.

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

(GSM network)

a. First row reports a complete set of GSM-related information for the serving cell:

#MONIZIP: <bsic>,<lac>,<id>,<arfcn>,<dBm>,<C1value>, <C2value>,<timadv>,<qual>,<cc><nc><CR><LF>

b. 2nd to 7th rows report a reduced set of GSM-related information for the cells in the neighbours:

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#MONIZIP – Compressed Cell Monitor	SELINT 2
	#MONIZIP: <bsic>,<lac>,<id>,<arfcn>,<dBm>,<C1value>, <C2value>[<CR><LF>] where: <C1value> - C1 reselection parameter <C2value> - C2 reselection parameter *other parameters as before* **(UMTS network)** a. First row reports a set of information for the serving cell: **#MONIZIP: <netname>,<psc>,<rscp>,<lac>,<id>,<ecio>,<uarfcn>, <dBm>,<drx>,<scr>** b. the other rows report a set of information for all detected neighbour cells: **#MONIZIP: <psc>,<rscp>,<ecio>,<uarfcn>,<scr>** See above for parameters description .
AT#MONIZIP=?	Test command reports the maximum number of cells, in the neighbour list of the serving cell excluding it, from which we can extract GSM-related information, along with the ordinal number of the current selected cell, in the format: #MONIZIP: (<MaxCellNo>,<CellSet>) where: <MaxCellNo> - maximum number of cells, in the neighbour list of the serving cell and excluding it, from which we can extract GSM-related information. This value is always **6**. <CellSet> - the last setting done with command **#MONIZIP**.
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.
Note	The serving cell is the current serving cell or the last available serving cell, if the module loses coverage.

5.1.6.1.38. Serving Cell Information - #SERVINFO

#SERVINFO - Serving Cell Information	SELINT 2
AT#SERVINFO	Execution command reports information about serving cell, in the format: (**GSM network**) **#SERVINFO: <B-ARFCN>,<dBM>,<NetNameAsc>,<NetCode>,** **<BSIC>,<LAC>,<TA>,<GPRS>[,[<PB-ARFCN>],[<NOM>],** **<RAC>,[<PAT>]]** (**UMTS network**) #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>** - string representing the network operator in numeric format: 5 or 6 digits [country code (3) + network code (2 or 3)] **<BSIC>** - Base Station Identification Code **<LAC>** - Localization Area Code **<TA>** - Time Advance: it's available only if a GSM or GPRS is running **<GPRS>** - GPRS supported in the cell 0 - not supported 1 - supported The following information will be present only if GPRS is supported in the cell **<PB-ARFCN>** - • if PBCCH is supported by the cell o if its content is the PBCCH ARFCN of the serving cell, then **<PB-ARFCN>** is available o else the label **"hopping"** will be printed • else **<PB-ARFCN>** is not available **<NOM>** - Network Operation Mode .."I" "II" .."III" **<RAC>** - Routing Area Colour 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

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#SERVINFO - Serving Cell Information	SELINT 2
	0 – No Service 1 – CS Only 2 – PS Only 3 – CS & PS <**RSCP**> - Received Signal Code Power in dBm During a call, a SMS sending/receiving or a location update the value of <**GPRS**>, <**PB-ARFCN**>, <**NOM**>, <**RAC**> and <**PAT**> parameters don't make sense.
AT#SERVINFO=?	Test command tests for command existence.

5.1.6.1.39. Lock to single BCCH_ARFCN - #BCCHLOCK

#BCCHLOCK – Lock to single BCCH ARFCN	SELINT 2
AT#BCCHLOCK=<LockedBcch>[,<LockedUarfcn>[,<LockedPsc>]]	This command allows to set the single BCCH ARFCN the device must be locked to, selectable within those allowed for the specific product. Parameters: <LockedBcch>: 1024 - disables 2G BCCH locking (factory default); 0-124, 975-1023 - enables 2G BCCH locking on GSM 900MHz; 512-885 - enables 2G BCCH locking on DCS 1800MHz; 128-251 - enables 2G BCCH locking on GSM 850MHz; 512-810 - enables 2G BCCH locking on PCS 1900MHz. <LockedUarfcn>: 0 - disables 3G BCCH locking (factory default); 412-10838 - enables 3G BCCH locking on downlink UARFCN in UMTS supported bands (some values in range 412-10838 are not supported according to product band configuration). <LockedPsc>: 65535 - disables 3G BCCH locking Primary Scrambling Code selection (factory default); 0-511 - enables 3G BCCH locking Primary Scrambling Code selection on downlink UARFCN. Note: the values set by command are directly stored in NVM and don't depend on the specific CMUX instance. Note: it is not possible to lock to a 2G BCCH and a 3G BCCH at the

	same time. Note: 3G BCCH Primary Scrambling Code selection is active only if locked to a 3G BCCH. Note: if selected locked 2G/3G BCCH is not available, the module will be out of GSM/GPRS/UMTS network service even for emergency calls and will not select an alternative BCCH. Note: if selected locked BCCH is available but the module is not allowed to register to the corresponding PLMN, the module will be able to perform only emergency calls and will not select an alternative BCCH. Note: if selected locked 2G/3G BCCH is available, the module, in idle and in GPRS/UMTS data transfer, will not perform reselection to another cell/ARFCN. Note: if selected locked 2G BCCH is available, the module, in GSM data transfer (voice call, data call, sms), will not perform handover to another cell. Note: if selected locked 3G BCCH is available, the module, in UMTS connection, will not perform handover to another cell/ARFCN. Note: **AT#BCCHLOCK** setting implies a RAT selection, that is why it is not recommended to use this command together with **AT+WS46**. Note: **AT#BCCHLOCK** setting has higher priority than PLMN selection, that is why it is not recommended to use this command together with manual PLMN selection **AT+COPS=1,...** . Note: in case of a device with current setting **AT#AUTOBND=0** there might be conflicts between **AT#BND**, and **AT#BCCHLOCK** stored values. It is user responsibility to set proper values avoiding conflicts (no cross check is available between the commands). Note: 3G only products support **<LockedBcch>** parameter value 1024 only.
AT#BCCHLOCK?	Read command reports the currently stored parameter **<LockedBcch>**, **<LockedUarfcn>** and **<LockedPsc>** in the format: **#BCCHLOCK: <LockedBcch>,<LockedUarfcn>,<LockedPsc>**
AT#BCCHLOCK=?	Test command reports the supported range of values for

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	parameter <LockedBcch>, <LockedUarfcn> and <LockedPsc>.

5.1.6.1.40. Read current network status - #RFSTS

#RFSTS – Read current network status	**SELINT 2**
AT#RFSTS	Execution command reads current network status, in the format: **(GSM network)** **#RFSTS:<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,** **<RR>,<NOM>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>** Where: **<PLMN>** - Country code and operator code(MCC, MNC) **<ARFCN>** - GSM Assigned Radio Channel **<RSSI>** - Received Signal Strength Indication **<LAC>** - Localization Area Code **<RAC>** - Routing Area Code **<TXPWR>** - Tx Power **<MM>** - Mobility Management state (for debug purpose only) 0 - NULL 3 - LOCATION UPDATING INITIATED 5 - WAIT FOR OUTGOING MM CONNECTION 6 - CONNECTION ACTIVE 7 - IMSI DETACH INITIATED 8 - PROCESS CM SERVICE PROMPT 9 - WAIT FOR NETWORK COMMAND 10 - LOCATION UPDATE REJECTED 13 - WAIT FOR RR CONNECTION LOCATION UPDATE 14 - WAIT FOR RR CONNECTION MM 15 - WAIT FOR RR CONNECTION IMSI DETACH 17 - WAIT FOR REESTABLISHMENT 18 - WAIT FOR RR ACTIVE 19 - IDLE 20 - WAIT FOR ADDITIONAL OUTGOING MM CONNECTION 21 - CONNECTION ACTIVE GROUP TRANSMIT 22 - WAIT RR CONNECTION GROUP TRANSMIT 23 - LOCATION UPDATING PENDING 24 –IMSI DETACH PENDING 25 - RR CONNECTION RELEASE NOT ALLOWED 255 - UNKNOWN **<RR>** - Radio Resource state (for debug purpose only) 2 - CELL SELECTION

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#RFSTS – Read current network status	SELINT 2
	3 - WAIT CELL SELECTION 4 - DEACTIVATION CELL SELECTION 5 - SELECT ANY CELL 6 - WAIT SELECT ANY CELL 7 - DEACTIVATION SELECT ANY CELL 8 - WAIT INACTIVE 9 - INACTIVE 10 WAIT IDLE 11 - IDLE 12 - PLMN SEARCH 13 - CELL RESELECTION 14 - WAIT CELL RESELECTION 15 - DEACTIVATION PLMN SEARCH 16 - CELL CHANGE 17 - CS CELL CHANGE 18 - WAIT CELL CHANGE 19 - SINGLE BLOCK ASSIGNMENT 20 - DOWNLINK TBF ESTABLISH 21 - UPLINK TBF ESTABLISH 22 - WAIT TBF 23 - TRANSFER 24 - WAIT SYNC 25 - DTM ENHANCED CALL ESTABLISH 26 - DTM 27 - DTM ENHANCED MO CALL ESTABLISH 28 - MO CONNECTION ESTABLISH 29 - MT CONNECTION ESTABLISH 30 - RR CONNECTION 31 - DTM ESTABLISH 32 - DTM RELEASE 33 - CALL REESTABLISH 34 – DEACTIVATION CALL REESTABLISH 35 - NORMAL CHANNEL RELEASE 36 - LOCAL CHANNEL RELEASE 37 - DEACTIVATION 38 - ENHANCED DTM CS CALL ESTABLISH 39 - CELL RESELECTION TO UTRAN 40 - DTM ENHANCED CS CALL ESTABLISH 41 – INTER RAT ACTIVE ON HOLD 42 – INTER RAT RESEL ABORT 43 – INTER RAT WAIT INTER RAT 44 – INTER RAT WAIT FOR RSRC 45 - DSIM SUSPEND 46 - DSIM WAIT SUSPEND

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#RFSTS – Read current network status	SELINT 2

47 - DSIM WAIT SUSPEND IDLE
<NOM> - Network Operator Mode
<CID> - Cell ID
<IMSI> - International Mobile Subscriber Identity
<NetNameAsc> - Operator name
<SD> - Service Domain
0 - No Service
1 - CS only
2 - PS only
3 - CS+PS

<ABND> - 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>]

Where:
<PLMN> - Country code and operator code(MCC, MNC)
<UARFCN> - UMTS Assigned Radio Channel
<PSC> - Active PSC(Primary Synchronization Code)
<Ec/Io> - Active Ec/Io(chip energy per total wideband power in dBm)
<RSCP> - Active RSCP (Received Signal Code Power in dBm)
<RSSI> - Received Signal Strength Indication
<LAC> - Localization Area Code
<RAC> - Routing Area Code
<TXPWR> - Tx Power
<DRX> - Discontinuous reception cycle Length (cycle length in ms)
<MM> - Mobility Management state (for debug purpose only)
0 - NULL
3 - LOCATION UPDATING INITIATED
5 - WAIT FOR OUTGOING MM CONNECTION
6 - CONNECTION ACTIVE
7 - IMSI DETACH INITIATED
8 - PROCESS CM SERVICE PROMPT
9 - WAIT FOR NETWORK COMMAND
10 - LOCATION UPDATE REJECTED
13 - WAIT FOR RR CONNECTION LOCATION UPDATE
14 - WAIT FOR RR CONNECTION MM

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#RFSTS – Read current network status	SELINT 2
	15 - WAIT FOR RR CONNECTION IMSI DETACH 17 - WAIT FOR REESTABLISHMENT 18 - WAIT FOR RR ACTIVE 19 - IDLE 20 - WAIT FOR ADDITIONAL OUTGOING MM CONNECTION 21 - CONNECTION ACTIVE GROUP TRANSMIT 22 - WAIT RR CONNECTION GROUP TRANSMIT 23 - LOCATION UPDATING PENDING 24 –IMSI DETACH PENDING 25 - RR CONNECTION RELEASE NOT ALLOWED 255 - UNKNOWN **<RRC>** - Radio Resource state (for debug purpose only) 0 - CELL DCH 1 - CELL FACH 2 - CELL PCH 3 - URA PCH 4 - IDLE 5 - IDLE CCCH **<NOM>** - Network Operator Mode **<BLER>** - Block Error Rate (e.g., 005 means 0.5 %) **<CID>** - Cell ID **<IMSI>** - International Mobile Station ID **<NetNameAsc>** - Operator name **<SD>** - Service Domain (see above) **<nAST>** - 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
AT#RFSTS=?	Test command tests for command existence.

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5.1.6.1.41. Query SIM Status - #QSS

#QSS – Query SIM Status	SELINT 2
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 is possible only to query the current SIM status through Read command **AT#QSS?** 1 - enabled: the ME informs at every SIM status change through the following basic 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).
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**>.

5.1.6.1.42. Delete all phonebook entries - #CPBD

#CPBD – Delete All Phonebook Entries	SELINT 2
AT#CPBD	Execution command deletes all phonebook entries in the current phonebook

#CPBD – Delete All Phonebook Entries	SELINT 2
	memory storage selected with **+CPBS**.
AT#CPBD=?	Test command tests for command existence

5.1.6.1.43. ATD Dialing Mode - #DIALMODE

#DIALMODE - Dialing Mode	SELINT 2
AT#DIALMODE= [<mode>]	Set command sets dialing modality. Parameter: **<mode>** 0 - (voice call only) **OK** result code is received as soon as it starts remotely ringing (factory default) 1 – (voice call only) **OK** result code is received only after the called party answers. Any character typed aborts the call and **OK** result code is received. 2 - (voice call and data call) the following custom result codes are received, monitoring step by step the call status: **DIALING** (MO in progress) **RINGING** (remote ring) **CONNECTED** (remote call accepted) **RELEASED** (after **ATH**) **DISCONNECTED** (remote hang-up) Any character typed before the CONNECTED message aborts the call Note: In case a BUSY tone is received and at the same time **ATX0** is enabled **ATD** will return **NO CARRIER** instead of **DISCONNECTED.** Note: The setting is saved in NVM and available on following reboot.
AT#DIALMODE?	Read command returns current **ATD** dialling mode in the format: **#DIALMODE: <mode>**
AT#DIALMODE=?	Test command returns the range of values for parameter **<mode>**

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5.1.6.1.44. Automatic call - #ACAL

#ACAL - Automatic Call	SELINT 2
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>** Note: as a consequence of the introduction of the command **#ACALEXT** (Extended Automatic Call) it is possible that the Read Command returns a value supported by **#ACALEXT** but **NOT** supported by **#ACAL**. **AT#ACAL?** **#ACAL : 2** **OK** Due to this possible situation it is strongly recommended not to use contemporaneously both commands.
AT#ACAL=?	Test command returns the supported range of values for parameter **<mode>**.
Note	See **&Z** to write and **&N** to read the number on module internal phonebook.

5.1.6.1.45. Extended automatic call - #ACALEXT

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

5.1.6.1.46. Extended Call Monitoring - #ECAM

#ECAM - Extended Call Monitoring	**SELINT 2**
AT#ECAM=[<onoff>]	This command enables/disables the call monitoring function in the ME. Parameter: **<onoff>** 0 - disables call monitoring function (factory default) 1 - enables call monitoring function; the ME informs about call events, such as incoming call, connected, hang up etc. using the following unsolicited indication: **#ECAM: <ccid>,<ccstatus>,<calltype>,,,[<number>,<type>]** where **<ccid>** - call ID **<ccstatus>** - call status 0 - idle 1 - calling (MO) 2 - connecting (MO) 3 - active 4 - hold 5 - waiting (MT) 6 - alerting (MT) 7 - busy **<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>**

5.1.6.1.47. SMS Overflow - #SMOV

#SMOV - SMS Overflow	SELINT 2
AT#SMOV=[<mode>]	Set command enables/disables the SMS overflow signalling function. Parameter: **<mode>** 0 - disables SMS overflow signalling function (factory default) 1 - enables SMS overflow signalling function; when the maximum storage capacity has been reached, the following network initiated notification is sent: **#SMOV: <memo>** **where <memo> is a string indicating the SMS storage that has reached maximum capacity:** **"SM" – SIM Memory** **"ME" – NVM SMS storage**
AT#SMOV?	Read command reports whether the SMS overflow signalling function is currently enabled or not, in the format: **#SMOV: <mode>**
AT#SMOV=?	Test command returns the supported range of values of parameter **<mode>**.

5.1.6.1.48. Mailbox Numbers - #MBN

#MBN - Mailbox Numbers	SELINT 2
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

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#MBN - Mailbox Numbers	SELINT 2
	"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.

5.1.6.1.49. Message Waiting Indication - #MWI

#MWI - Message Waiting Indication	SELINT 2
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.. 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>][...]]]**

#MWI - Message Waiting Indication	SELINT 2
	where: **<status>** 0 - no waiting message indicator is currently set: if this the case no other information is reported 1 - there are waiting messages related to the message waiting indicator **<indicator>**. **<indicator>** 1 - either Line 1 (CPHS context) or Voice (3GPP context) 2 - Line 2 (CPHS context) 3 - Fax 4 - E-mail 5 - Other **<count>** - message counter: number of pending messages related to the message waiting indicator **<indicator>** as it is stored on SIM.
AT#MWI?	Read command reports 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>**.

5.1.6.1.50. Network Emergency Number Update - #NWEN

#NWEN – Network Emergency Number Update	SELINT 2
AT#NWEN=[<en>]	Set command enables/disables unsolicited indication of emergency number update. Parameters: **<en>** 0 - disables unsolicited indication of emergency number update (factory default) 1 - enables unsolicited indication 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
AT#NWEN?	Read command reports whether the unsolicited indication of network emergency number update is currently enabled or not, in the format:

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#NWEN – Network Emergency Number Update		SELINT 2
	#NWEN: <en>	
AT#NWEN=?	Test command reports the range for the parameter <en>	

5.1.6.1.51. Update PLMN List - #PLMNUPDATE

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

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	NOTE: the entries are in increasing order by MCC and MNC
AT#PLMNUPDATE=?	Test command returns the range of **<action>** parameter and the maximum length of **<MCC>**, **<MNC>** and **<PLMNname>** parameters.

5.1.6.1.52. PLMN List Selection - #PLMNMODE

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

5.1.6.1.53. Periodical FPLMN cleaning - #FPLMN

#FPLMN – Periodically FPLMN clearing	**SELINT 2**
AT#FPLMN=<action>[,<period>]	Periodically delete the Forbidden PLMN list stored inside the SIM card. Parameters: **<action>** : 0 – disable periodic FPLMN clearing (default) 1 – enable periodic FPLMN clearing with period **<period>** 2 – clear FPLMN file on SIM (one shot) 3 – list contents of forbidden PLMN list file **<period>** : interval in minutes from FPLMN clearing, range 1...60, default value is 60 Note: the disable/enable value set by command is directly stored in NVM.
AT#FPLMN?	Read command reports whether the periodic deletion is currently enabled

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	or not, and the deletion period, in the format: #FPLMN: **<action>,<period>**
AT#FPLMN=?	Test command reports available values for parameters <**action**> and <**period**>.

5.1.6.1.54. Show Call Timers - #SCT

#SCT – Show Call Timers	**SELINT 2**
AT#SCT	Execution command returns the value stored in USIM field Incoming Call Timer, which contains the accumulated incoming call timer duration value for the current call and previous calls, and the value stored in the USIM field Outgoing Call Timer, that contains the accumulated outgoing call timer duration value for the current call and previous calls, in the format: **#SCT: <ICT>,<OCT>** where: **<ICT>** - Incoming Call Timer string, in the format: "hh:mm:ss", where hh - hour mm - minute ss - seconds **<OCT>** - Outgoing Call Timer string, in the format: "hh:mm:ss", where hh - hour mm - minute ss - seconds
AT#SCT=?	Test command returns the **OK** result code.

5.1.6.1.55. #Show Call Information - #SCI

#SCI – Show Call Information	**SELINT 2**
AT#SCI	Execution command returns the value stored in USIM field Incoming Call Information, which contains the time of the call and duration of the last calls, and the value stored in the USIM field Outgoing Call Information, that contains time of the call and duration of the last calls, in the format: **#SCI:**

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#SCI – Show Call Information	SELINT 2
	<index1>,<number>,<text>,<callTime>,<callDuration>[,<status>]<CR><LF> **#SCI:** **<index2>,<number>,<text>,<callTime>,<callDuration>[,<status>][…]]]** where: **<index*n*>** - the type of the entry (1: incoming call; 2: outgoing call) **<number>** - string type phone number **<text>** - the alphanumeric text associated to the number; used character set should be the one selected with command **+CSCS** **<callTime>** - call time yy/MM/dd,hh:mm:ss±zz, where yy - year MM - month dd - day hh - hour mm - minute ss - seconds ±zz - time zone **<callDuration>** - call duration in the format: "hh:mm:ss", where hh - hour mm - minute ss - seconds **<status>** - only for incoming calls, call status (0: answered: 1: not answered)
AT#SCI=?	Test command returns the **OK** result code.

5.1.6.1.56. Packet Service Network Type - #PSNT

#PSNT – Packet Service Network Type	SELINT 2
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
AT#PSNT?	Read command reports the **<mode>**,**<nt>** and HSUPA and HSDPA related info in the format: (<mode> = 2)

#PSNT – Packet Service Network Type	SELINT 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>** - HSPA used 0 – HSDPA is not in use 1 – HSDPA is in use Note: when the reported type of network **<nt>** is 2, the **<nt>** indication could be not complete in idle, because it depends on some not always

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#PSNT – Packet Service Network Type	SELINT 2
	broadcasted network parameters (HSDPA could be supported anyway); it is valid during traffic.
AT#PSNT=?	Test command reports the range for the parameter **<mode>**

5.1.6.1.57. SIM Presence status - #SIMPR

#SIMPR – SIM Presence status	SELINT 2
AT#SIMPR=[<mode>]	Set command enables/disables the SIM Presence Status unsolicited indication in the ME. This command reports also the status of the remote SIM, if the SAP functionality is supported and has been enabled. Parameter: **<mode>** - type of notification 0 – disabled (factory default) 1 - enabled; the ME informs at every (local and remote) SIM status change through the following unsolicited indication: **#SIMPR: <SIM>,<status>** where: **<SIM>** - local or remote SIM 0 local SIM 1 remote SIM **<status>** - current SIM status 0 - SIM NOT INSERTED 1 - SIM INSERTED
AT#SIMPR?	Read command reports whether the unsolicited indication #SIMPR is currently enabled or not, along with the local and remote SIM status, in the format: **#SIMPR: <mode>,0,<status><CR><LF>** **#SIMPR: <mode>,1,<status>** If SAP functionality is not supported or enabled the remote SIM status will always be 0.
AT#SIMPR=?	Test command reports the range for the parameter **<mode>**

5.1.6.1.58. Call Forwarding Flags - #CFF

#CFF – Call Forwarding Flags	SELINT 2
AT#CFF=<enable>	Set command enables/disables the presentation of the **call forwarding flags** URC. Parameter:

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#CFF – Call Forwarding Flags	SELINT 2
	<enable> 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 setting is changed or checked and, at startup, the presentation of the status of the **call forwarding flags**, as they are currently stored on SIM. The URC format is: **#CFF: <status>,<fwdtonum>** where: **<status>** 0 – CFU disabled 1 – CFU enabled **< fwdtonum >** - number incoming calls are forwarded to The presentation at start up of the **call forwarding flags** status, as they are currently stored on SIM, is as follows: **#CFF: <status>,< fwdtonum >** where: **<status>** 0 – CFU disabled 1 – CFU enabled **< fwdtonum >** - number incoming calls are forwarded to
AT#CFF?	Read command reports whether the presentation of the **call forwarding flags** URC is currently enabled or not, and, if the flags field is present in the SIM, the current status of the **call forwarding flags** as they are currently stored on SIM, and the number incoming calls are forwarded to. The format is: **#CFF: <enable>[,<status>,< fwdtonum >]**
AT#CFF=?	Test command returns the range of available values for parameter **<enable>**.

5.1.6.1.59. GSM and UMTS Audio Codec - #CODEC

#CODEC – GSM and UMTS Audio Codec	SELINT 2
AT#CODEC= [<codec>]	Set command sets the GSM and UMTS audio codec mode. Parameter:

#CODEC – GSM and UMTS Audio Codec	SELINT 2
	<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 wide band 64 – **UAMR2**, UMTS AMR version 2 128 – **UAWB**, UMTS AMR wide band Note: the full rate mode is added by default to any setting in the SETUP message (as specified in ETSI 04.08), but the call drops if the network assigned codec mode has not been selected by the user. Note: AT#CODEC=4 and AT#CODEC= 16 are not recommended; better using AT#CODEC=5 and AT#CODEC=24 respectively Note: the setting 0 is equivalent to the setting 255. Note: The codec setting is saved in the profile parameters. Note: 3G only products support **<codec>** parameter value 0 or sum of integers 64 and 128 only.
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)*

5.1.6.1.60. Network Timezone - #NITZ

#NITZ - Network Timezone	SELINT 2
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:

#NITZ - Network Timezone	SELINT 2
	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) (default: 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 0-3. Note: If the DST information isn't sent by the network, then the **<datetime>** parameter has the format **"yy/MM/dd,hh:mm:ss±zz"**
AT#NITZ?	Read command reports whether (a) automatic date/time updating, (b) Full Network Name applying, (c) **#NITZ** URC (as well as its format) are currently enabled or not, in the format: **#NITZ: <val>,<mode>**
AT#NITZ=?	Test command returns supported values of parameters **<val>** and **<mode>**.

5.1.6.1.61. Clock management - #CCLK

#CCLK - Clock Management	SELINT 2

#CCLK - Clock Management	SELINT 2
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: "02/09/07,22:30:25+04,1" OK

5.1.6.1.62. Clock Mode - #CCLKMODE

#CCLKMODE – Clock Mode	SELINT 2
AT#CCLKMODE=<mode>	Set command enables the local time or the UTC time in AT+CCLK and AT#CCLK commands and in #NITZ URC Parameter: **<mode>** - time and date mode

#CCLKMODE – Clock Mode	**SELINT 2**
	0 - Local time + local time zone offset (default) 1 – UTC time + local time zone offset Note: the setting is saved automatically in NVM.
AT#CCLKMODE?	Read command reports whether the local time or the UTC time is enabled, in the format: **#CCLKMODE: <mode>** (**<mode>** described above)
AT#CCLKMODE=?	Test command reports the supported range of values for parameter <**mode**>
Example:	at#cclkmode? #CCLKMODE: 0 OK #NITZ: 13/03/05,15:20:33+04,0 at+cclk? +CCLK: "13/03/05,15:20:37+04" OK at#cclkmode=1 OK at+cclk? +CCLK: "13/03/05,14:20:45+04" OK at#cclkmode? #CCLKMODE: 1 OK #NITZ: 13/03/05,14:20:53+04,0 at+cclk? +CCLK: "13/03/05,14:20:55+04" OK at#cclkmode=0 OK at+cclk? +CCLK: "13/03/05,15:20:59+04" OK

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5.1.6.1.63. Calculate and update date and time - #NTP

#NTP – calculate and update date and time	SELINT 2
AT#NTP= <NTPaddr>, <NTPPort>, <update_module_clock>, <timeout>[,<TimeZone>]	This command permits to calculate and update date and time through NTP protocol(RFC2030), sending a request to a NTP server. Parameters: **<NTPaddr>** - address of the NTP server, 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 **<NTPPort>** - NTP server port to contact 1..65535 **<update_module_clock>** 0 - no update module clock 1 – update module clock **<timeout>** - waiting timeout for server response in seconds 1..10 **<TimeZone>** - Time Zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT), range is -47..+48; default is 0. Note: the Time Zone is applied directly in the Date and Time received by the NTP Server, that is, by definition, GMT+0
AT#NTP=?	Test command reports the supported range of values for parameters **<NTPaddr>,<NTPPort>,<update_module_clock>, <timeout>** and **<TimeZone>**
Example	at#ntp="ntp1.inrim.it",123,1,2,4 #NTP: 12/01/27,14:42:38+04 OK …. at+cclk? +CCLK: "12/01/27,14:42:39+04" OK

5.1.6.1.64. Enhanced Network Selection - #ENS

#ENS - Enhanced Network Selection	SELINT 2
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: □ at every next power-up a Band GSM 850 and PCS enabled (**AT#BND=3**) b SIM Application Toolkit enabled on user interface 0 if not previously enabled on a different user interface (**AT#STIA=2**) □ just at first next power-up a Automatic Band Selection enabled (**AT#AUTOBND=2**) only if the previous setting was equal to **AT#AUTOBND=0** Note: the new setting will be available just at first next power-up. Note: If 'Four Band' Automatic Band Selection has been activated (**AT#AUTOBND=2**), at power-up the value returned by **AT#BND?** could be different from 3 when ENS functionality is enabled.
AT#ENS?	Read command reports whether the ENS functionality is currently enabled or not, in the format: **#ENS: <mode>** where: **<mode>** as above
AT#ENS=?	Test command reports the available range of values for parameter **<mode>**.
Reference	Cingular Wireless LLC Requirement

5.1.6.1.65. Select Band - #BND

#BND - Select Band	SELINT 2
AT#BND= **[<band> [,** **<UMTS band>]]**	Set command selects the current GSM and UMTS bands. Parameter **<band>**: 0 - GSM 900MHz + DCS 1800MHz (default value) 1 - GSM 900MHz + PCS 1900MHz; this value is not available if the ENS functionality has been activated (see **#ENS**) 2 - GSM 850MHz + DCS 1800MHz (available only on quadri-band modules); this value is not available if the ENS functionality has been activated (see **#ENS**) 3 - GSM 850MHz + PCS 1900MHz (available only on quadri-band modules)

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#BND - Select Band	SELINT 2
	<UMTS band>: 0 - 1900 / 2100MHz(FDD I) 1 - 1900MHz(FDD II) (default value depending on product) 2 - 850MHz(FDD V) 3 - 2100MHz(FDD I) + 1900MHz(FDD II) + 850MHz(FDD V) 4 - 1900MHz(FDD II) + 850MHz(FDD V) 5 - 900MHz(FDD VIII) (default value, depending on the product) 6 - 2100MHz(FDD I) + 900MHz(FDD VIII) 7 – 1700/ 2100MHz(FDD IV, AWS) Note: This setting is maintained even after power off. Note: if the normal automatic band selection is enabled (**AT#AUTOBND=1**) then the last **#BND** settings can automatically change at power-up; then you can normally use the command. Note: if the 'four bands' automatic band selection is enabled (**AT#AUTOBND=2**) then you can issue **AT#BND=<band>** but it will have no functional effect; nevertheless every following read command **AT#BND?** will report that setting. Note: not all products support all the values of parameter **<UMTS 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: <band> , <UMTS band>**
AT#BND=?	Test command returns the supported range of values of parameters **<band>** and **<UMTS band>**.

5.1.6.1.66. Automatic Band Selection - #AUTOBND

#AUTOBND - Automatic Band Selection	SELINT 2
AT#AUTOBND=[<value>]	Set command enables/disables the automatic band selection at power-on. Parameter: **<value>**: 0 - disables automatic band selection at ***next*** power-up 1 - enables automatic band selection at ***next*** power-up; the automatic band selection stops as soon as a cell is found (deprecated). 2 – (default) enables automatic band selection in all supported bands; differently from previous settings it takes ***immediate*** effect

#AUTOBND - Automatic Band Selection	**SELINT 2**
	Note: necessary condition to *effectively* have automatic band selection at next power-up (due to either **AT#AUTOBND=1** or **AT#AUTOBND=2**) is that **AT+COPS=0** has to be previously issued Note: if automatic band selection is enabled **(AT#AUTOBND=1)** the band changes every about 90 seconds through available bands until a cell is found. Note: if the current setting is equal to **AT#AUTOBND=0** and we're issuing **AT#ENS=1**, at ***first next*** power-up after the ENS functionality has been activated (see **#ENS**) the automatic band selection (**AT#AUTOBND=2**) is enabled.
AT#AUTOBND?	Read command returns whether the automatic band selection is enabled or not in the form: **#AUTOBND: <value>**
AT#AUTOBND=?	Test command returns the range of supported values for parameter **<value>**.

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5.1.6.1.67. PPP-GPRS Connection Authentication Type - #GAUTH

#GAUTH – PPP Data Connection Authentication Type	SELINT 2
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 authentication type, in the format: **#GAUTH: <type>**
AT#GAUTH=?	Test command returns the range of supported values for parameter **<type>**.

5.1.6.1.68. PPP-GPRS Parameters Configuration - # GPPPCFG

#GPPPCFG - PPP-GPRS Parameters Configuration	SELINT 2
AT#GPPPCFG= <hostIPaddress> [,<unused_A>] [,<unused_B>]]	Set command sets one parameter for a PPP-GPRS connection. Parameters: **<hostIPaddress> - Host IP Address** that is assigned to the PPP server side (the host application); Sstring type, it can be any valid IP address in the format: xxx.xxx.xxx.xxx. Note: if **<hostIPaddress>="000.000.000.000"** (factory default) host address is not included in the IPCP Conf Req, host address choice is left to the peer
AT# GPPPCFG?	Read command reports the current PPP-GPRS connection parameters in the format: **#GPPPCFG: <hostIPaddress>„<unused_A>,<unused_B>**
AT# GPPPCFG=?	Test command returns the range of supported values for parameters **#GPPPCFG: (25),(0)**

5.1.6.1.69. Skip Escape Sequence - #SKIPESC

#SKIPESC - Skip Escape Sequence	SELINT 2
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. 2 - skips the escape sequence; its transmission is not enabled. If there are data pending in the receiving buffer from the serial port driver, they are deleted. 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>**.

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5.1.6.1.70. Subscriber number - #SNUM

#SNUM – Subscriber Number	SELINT 2
AT#SNUM= <index>[,<number>[, <alpha>]]	Set command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file. Parameter: **<index>** - record number The number of record in the EFmsisdn depends on the SIM. If only **<index>** value is given, then delete the EFmsisdn record in location **<index>** is deleted. **<number>** - string containing the phone number **<alpha>** - alphanumeric string associated to **<number>.** Default value is empty string (“”), otherwise the used character set should be the one selected with **+CSCS.** The string could be written between quotes, the number of characters depends on the SIM. If empty string is given (""), the corresponding **<alpha>** will be an empty string. Note: the command return ERROR if EFmsisdn file is not present in the SIM or if MSISDN service is not allocated and activated in the SIM Service Table (see 3GPP TS 11.11).
AT#SNUM=?	Test command returns the **OK** result code

5.1.6.1.71. SIM detection mode - #SIMDET

#SIMDET - SIM Detection Mode	SELINT 2
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’(default for UL865 and UE866 families) 2 - automatic SIM detection through SIMIN Pin (default for HE910 and UE910 families) Note: with Sim-On-Chip products, #SIMDET allows to switch between internal and external SIM, as described below: 0 – switch to internal SIM 1 – switch to external SIM, ignore SIMIN pin. 2 – automatic external SIM detection through SIMIN Pin (default). NOTE: with #SIMDET=1, although SIMIN pin is ignored, SIM removal is

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#SIMDET - SIM Detection Mode	SELINT 2
	detected
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>**

5.1.6.1.72. GSM Context Definition - #GSMCONT

#GSMCONT - GSM Context Definition	SELINT 2
AT#GSMCONT= <cid>[,<P_type>, <CSD_num>]	Set command specifies context parameter values for the only GSM context, identified by the (local) context identification parameter 0. Parameters: **<cid>** - context Identifier; numeric parameter which specifies the only GSM context 0 **<P_type>** - protocol type; a string parameter which specifies the type of protocol "IP" - Internet Protocol **<CSD_num>** - phone number of the internet service provider Note: issuing **#GSMCONT=0** causes the values for context number **0** to become undefined.
AT#GSMCONT?	Read command returns the current settings for the GSM context, if defined, in the format: **+GSMCONT: <cid>,<P_type>,<CSD_num>**
AT#GSMCONT=?	Test command returns the supported range of values for all the parameters.

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5.1.6.1.73. Show Address - #CGPADDR

#CGPADDR - Show Address	**SELINT 2**
AT#CGPADDR=[<cid>[,<cid>[,…]]]	Execution command returns either the IP address for the GSM context (if specified) and/or a list of PDP addresses for the specified PDP context identifiers Parameters: **<cid>** - context identifier 0 - specifies the GSM context (see **+GSMCONT**). 1..5 - numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). Note: if no **<cid>** is specified, the addresses for all **defined** contexts are returned. Note: issuing the command with more than 6 parameters raises an error. Note: the command returns only one row of information for every specified **<cid>**, even if the same **<cid>** is present more than once. The command returns a row of information for every specified **<cid>** whose context has been already defined. No row is returned for a **<cid>** whose context has not been defined yet. Response format is: **#CGPADDR: <cid>,<address>[<CR><LF>** **#CGPADDR: <cid>,<address>[…]]** where: **<cid>** - context identifier, as before **<address>** - its meaning depends on the value of **<cid>** a) if **<cid>** is the (only) GSM context identifier (**<cid>=0**) it is the dynamic address assigned during the GSM context activation. b) if **<cid>** is a PDP context identifier (**<cid>** in (1..5)) it is 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>.** Note: if no address is available the empty string (**“”**) is represented as **<address>.**
AT#CGPADDR=?	Test command returns a list of defined **<cid>**s.
Example	AT#SGACT=0,1 #SGACT: xxx.yyy.zzz.www OK

	AT#CGPADDR=0 #CGPADDR: 0,"xxx.yyy.zzz.www" OK AT#CGPADDR=? #CGPADDR: (0) OK

5.1.6.1.74. Call Establishment Lock - #CESTHLCK

#CESTHLCK – Call establishment lock	**SELINT 2**
AT#CESTHLCK= [<closure_type >]	This command can be used to disable call abort before the DCE enters connected state. **< closure_type >:** 0 - Aborting the call setup by reception of a character is generally possible at any time before the DCE enters connected state (default) 1 - Aborting the call setup is disabled until the DCE enters connected state
AT#CESTHLCK?	Read command returns the current setting of **<closure_type>** parameter in the format: **#CESTHLCK: <closure_type>**
AT#CESTHLCK=?	Test command returns the supported range of values for the **<closure_type>** parameter

5.1.6.1.75. Write to I2C - #I2CWR

#I2CWR – Write to I2C	**SELINT 2**
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 Test Command.) **<sclPin>:** GPIO number to be used for SCL. Valid range is "any output pin" (see Test Command). **<deviceId>:** address of the I2C device, with the LSB, used for read\write command. It doesn't matter if the LSB is set to 0 or to 1. 10 bit addressing supported. Value has to be written in hexadecimal form (without 0x).

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#I2CWR – Write to I2C	SELINT 2
	<registerId>: Register to write data to , range 0..255. Value has to be written in hexadecimal form (without 0x). **<len>:** number of data to send. Valid range is 1-254. The module responds to the command with the prompt '>' and awaits for the data to send. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). Data shall be written in Hexadecimal Form. If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported. Example if CheckAck is set and no Ack signal was received on the I2C bus NOTE: At the end of the execution GPIO will be restored to the original setting (check AT#GPIO Command) 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 reports the supported list of currently available <service>s.
Example	AT#I2CWR=2,3,20,10,14 > 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

5.1.6.1.76. Read to I2C - #I2CRD

#I2CRD – Read to I2C	SELINT 2
AT#I2CRD= **<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 Test Command.) **<sclPin>:** GPIO number to be used for SCL. Valid range is “any output pin” (see Command Test). **<deviceId>:** address of the I2C device, with the LSB, used for read\write

#I2CRD – Read to I2C	**SELINT 2**
	command. It doesn't matter if the LSB is set to 0 or to 1. 10 bit addressing supported. Value has to be written in hexadecimal form (without 0x before). **<registerId>:** Register to read data from, range 0..255. Value has to be written in hexadecimal form (without 0x before). **<len>:** number of data to receive. Valid range is 1-254. Data Read from I2C will be dumped in Hex: 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 reports the supported list of currently available <service>s.
Example	AT#I2CRD=2,3,20,10,12 #I2CRD: 00112233445566778899AABBCC OK

5.1.6.1.77. Power Saving Mode Ring - #PSMRI

#PSMRI – Power Saving Mode Ring	SELINT 2
AT#PSMRI=<x>	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 <x>. Parameter: <x> - RI enabling 0 - disables RI pin response for URC message(factory default) 50-1150 - enables RI pin response for URC messages. Note: when RING signal from incoming call/SMS/socket listen is enabled, the behaviour for #PSMRI will be ignored. Note: the behavior for #PSMRI is invoked, only when modem is in sleep mode (AT+CFUN=5 and AT+CFUN=9) Note: in case of AT+CFUN=9, the pulse is generated also when a GPRS packet is received. Note: the value set by command is stored in the profile extended section and doesn't depend on the specific AT instance
#PSMRI?	Read command reports the duration in ms of the pulse generated, in the format: **#PSMRI: <x>**
#PSMRI =?	Test command reports the supported range of values for parameter **<x>**

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5.1.6.1.78. Control Command Flow - #CFLO

#CFLO – Command Flow Control		SELINT 2
AT#CFLO= <enable>	Set command enables/disables the flow control in command mode. If enabled, current flow control is applied to both data mode and command mode. Parameter: **<enable>** - 0 – disable flow control in command mode <default value> 1 – enable flow control in command mode Note: setting value is saved in the profile	
AT#CFLO?	Read command returns current setting value in the format **#CFLO: <enable>**	
AT#CFLO=?	Test command returns the range of supported values for parameter **<enable>**	

5.1.6.1.79. Report concatenated SMS indexes - #CMGLCONCINDEX

#CMGLCONCINDEX – Report concatenated SMS indexes	SELINT 2
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

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5.1.6.1.80. Codec Information - #CODECINFO

#CODECINFO – Codec Information	SELINT 2
AT#CODECINFO[=<format>[, <mode>]]	This command is both a set and an execution command. Set command enables/disables codec information reports depending on the parameter **<mode>**, in the specified **<format>**. Parameters: **<format>** 0 – numeric format (default) 1 – textual format **<mode>** 0 - disable codec information unsolicited report (default) 1 - enable codec information unsolicited report only if the codec changes 2 - enable short codec information unsolicited report only if the codec changes If **<mode>=1** the unsolicited channel mode information is reported in the following format: (if **<format>=0**) **#CODECINFO: <codec_used>,<codec_set>** (if **<format>=1**) **#CODECINFO: <codec_used>,<codec_set1>** **[,<codec_set2>[..[,codec_setn]]]** If **<mode>=2** the unsolicited codec information is reported in the following format: **#CODECINFO: <codec_used>** The reported values are described below. Execution command reports codec information in the specified **<format>**. (if **<format>=0**) **#CODECINFO: <codec_used>,<codec_set>** (if **<format>=1**) **#CODECINFO: <codec_used>,<codec_set1>** **[,<codec_set2>[..[,codec_setn]]]** The reported values are:

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#CODECINFO – Codec Information	SELINT 2
	(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 2 136 – 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

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#CODECINFO – Codec Information	SELINT 2
	<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 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>**.

5.1.6.1.81. Select language - #LANG

#LANG – select language	SELINT 2
AT#LANG=<lan>	Set command selects the currently used language for displaying different messages Parameter: **<lan>** - selected language “en” – English (factory default) “it” – Italian
AT#LANG?	Read command reports the currently selected <lan> in the format: **#LANG: <lan>**
AT#LANG=?	Test command reports the supported range of values for parameter **<lan>**

5.1.6.1.82. Enable RX Diversity and set DARP - #RXDIV

#RXDIV – enable RX Diversity and set DARP	SELINT 2
AT#RXDIV=<DIV_enable>[,<DARP_mode>]	This command enables/disables the RX Diversity and sets the DARP. Parameters: **<DIV_enable>** RX Diversity 0 - disable the RX Diversity 1 - enable RX Diversity (default value) **<DARP_mode>** DARP mode 0 – DARP not supported 1 – DARP phase 1 2 – DARP phase 2 traffic only 3 – DARP always on (default value) Note: the values set by command are directly stored in NVM and don't depend on the specific CMUX instance. They are available at next power on. Note: if **<DIV_enable>** is set to 0, then **<DARP_mode>** is automatically set to 1 regardless the set value
AT#RXDIV?	Read command reports the currently selected **<DIV_enable>** and **<DARP_mode>** parameters in the format: **#RXDIV: <DIV_enable>,<DARP_mode>**
AT#RXDIV=?	Test command reports the supported range of values for parameters **<DIV_enable>** and **<DARP_mode>**

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

#RXTOGGLE– swap 3G-RX from main to diversity	SELINT 2
AT#RXTOGGLE=<TOGGLE_enable>	Set command moves the 3G-RX receiver from the main antenna to the diversity antenna Parameters: <TOGGLE_enable> 0 – set the RX to the main antenna

	1 – set the RX to the diversity antenna Note: the command is available only for HE910 products that support the diversity
AT#RXTOGGLE?	Read command reports the currently selected <TOGGLE_enable> in the format: #RXTOGGLE: <TOGGLE_enable>
AT#RXTOGGLE=?	Test command reports the supported range of values
Example:	AT+COPS=2 *module deregistered from GSM network* OK AT+RXDIV=0 *disable the RX Diversity* OK AT#REBOOT *reboot the module* OK AT+WS46=22 *select 3G cellular network* OK AT#RXTOGGLE=1 *set the RX to the diversity antenna* OK AT+COPS = 0 *register to the GSM network* OK AT+CREG =1 *enable network registration unsolicited result code* OK AT+CREG? *read <mode> and <stat> parameters* +CREG: 1,1 OK

5.1.6.1.84. Set Encryption algorithm - #ENCALG

#ENCALG – Set Encryption Algorithm	**SELINT 2**
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 1..7 - sum of integers each representing a specific GSM encryption algorithm: 1 – A5/1 2 – A5/2 4 – A5/3 255 - reset the default values

	<encGPRS>: 0 – no GPRS encryption algorithm 1..7 - sum of integers each representing a specific GPRS encryption algorithm: 1 – GEA1 2 – GEA2 4 – GEA3 255 - reset the default values Note: the values are stored in NVM and available on following reboot. Note: For possible **<encGSM>** and **<encGPRS>** encryptions see test command response. Note: If no parameter is issued, the set command returns ERROR.
AT#ENCALG?	Read command reports the currently selected **<encGSM>** and **<encGPRS>**, and the last used **<useGSM>** and **<useGPRS>** in the format: **#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>** Parameters: **<usedGSM>:** 0 – no GSM encryption algorithm 1 – A5/1 2 – A5/2 4 – A5/3 255 – not available **<usedGPRS>:** 0 – no GPRS encryption algorithm 1 – GEA1 2 – GEA2 4 – GEA3 255 – not available
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 *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

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5.1.6.1.85. Escape Sequence Guard Time - #E2ESC

#E2ESC - Escape Sequence Guard Time	SELINT 2
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 - guard time defined by command S12 (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 range of supported values for parameter **<gt>**.
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 - guard time defined by command S12 (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**.

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5.1.6.1.86. No Carrier Indication Handling - #NCIH

#NCIH – NO CARRIER Indication Handling	SELINT 2
AT#NCIH = <enable>	Set command enables/disables sending of a NO CARRIER indication when a remote call that is ringing is dropped by calling party before it is answered at called party. Parameter: **<enable>** - NO CARRIER indication sending 0 - disabled (factory default) 1 - enabled
AT#NCIH?	Read command reports whether the feature is currently enabled or not, in the format: **#NCIH: <enable>**
AT#NCIH=?	Test command returns the supported range of values for parameter **<enable>**.

5.1.6.1.87. Digital/Analog Converter Control - #DAC

#DAC - Digital/Analog Converter Control	SELINT 2
AT#DAC= [<enable> [,<value>]]	Set command enables/disables the **DAC_OUT** pin. Parameters: **<enable>** - enables/disables DAC output. 0 - disables pin; it is in high impedance status (factory default) 1 - enables pin; the corresponding output is driven **<value>** - scale factor of the integrated output voltage; it must be present if **<enable>=1** 0..1023 - 10 bit precision Note: **integrated output voltage = MAX_VOLTAGE * value / 1023** Note: the command automatically sets the GPIO_07 in alternate function ALT1
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:*

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#DAC - Digital/Analog Converter Control	SELINT 2
	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.

5.1.6.1.88. GSM Antenna Detection - #GSMAD

#GSMAD - GSM Antenna Detection	SELINT 2
AT#GSMAD= <mod>, [<urcmode> [,<interval> [,<detGPIO> [,<repGPIO>]]]]	Set command sets the behaviour of antenna detection algorithm Parameters: **<mod>** 0 - antenna 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 **#GSMAD** (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

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	#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 and can be set 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 and can be set only if **<mod>** is 1. ..1..3600 - seconds **<detGPIO>** - defines which GPIO shall be used as input by the Antenna Detection algorithm. For the **<detGPIO>** actual range see Test Command **<repGPIO>** - defines which GPIO shall be used by the Antenna Detection algorithm to report antenna condition. It has meaning only if **<mod>** is 1. For the **<repGPIO>** actual range see Test Command. Note: the URC presentation mode **<urcmode>** is related to the current AT instance only (see **+cmux**); last **<urcmode>** settings are saved for every instance as extended profile parameters, thus it is possible to restore them either if the multiplexer control channel is released and set up, back and forth. 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?	Read command returns the current parameter settings for **#GSMAD** command in

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

5.1.6.1.89. Change and insert file system password - #FILEPWD

#FILEPWD – Change and insert file system password	**SELINT 2**
AT#FILEPWD=<Mode>,<Pwd>[,<NewPwd>]	This command changes and inserts file system password. File system password is always enabled (see notes for factory default empty string “”). If current password is different from the empty string “” and password is not inserted then AT commands that make use of the file system will not work (see notes for insertion and AT response). Parameters: **<Mode>:** 1 – insert file system password; 2 – change file system password. **<Pwd>:** current password when inserting password, old password when changing password, string type (factory default is the empty string “”). **<NewPwd>:** new password when changing password, string type (only allowed if **<Mode>** parameter is 2). Note: maximum password length is 12 characters. Note: password is saved in NVM. Note: password value doesn’t depend on the specific CMUX instance. Note: in default configuration current password is equal to the empty string “” and password will be always considered inserted. Note: if current password is different from the empty string “”, password will be always not inserted at power on. Note: if current password is different from the empty string “”, after successful password insertion (<Mode> 1) password will remain inserted until power off. Note: after successful password change (<Mode> 2) password will be not inserted. Note: if current password is different from the empty string “” and password is not inserted then AT commands that make use of the file system (SCRIPT, M2M, MMS) will have either ERROR

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	or +CME ERROR: 16 or +CME ERROR: incorrect password response depending on AT+CMEE setting.
AT#FILEPWD=?	Test command reports the supported range of values for parameters.
Example	First time: change default password AT#FILEPWD=2,"","mynewpwd" OK and insert password AT#FILEPWD=1,"mynewpwd" OK At next power on: insert password AT#FILEPWD=1,"mynewpwd" OK

5.1.6.1.90. User Determined User Busy - #UDUB

#UDUB – User Determined User Busy	**SELINT 2**
AT#UDUB	Execution command disconnects all active calls (like **ATH** or **AT+CHUP**), but setting the "user busy" cause for disconnection (only if we have an incoming call that has not been answered yet, and that we want to reject).
AT#UDUB=?	Test command returns the **OK** result code

5.1.6.1.91. Enable Test Mode command in not signaling mode - #TESTMODE

#TESTMODE – Enable Test Mode command in not signalling mode	**SELINT 2**
AT#TESTMODE=<command>	The command allows setting module in not signaling mode. The functionality has to be first activated by sending **AT#TESTMODE="TM"**, which sets the module in Test Mode. Only after this set, **AT#TESTMODE** can be used with the other allowed commands. To exit from Test Mode and go back to Operative Mode, the command **AT#TESTMODE ="OM"** has to be sent. Parameter: **<command>**: • "*TM*"→ forces the module in Test Mode; • "*OM*"→ forces the module in Operative Mode **2G Commands**:

#TESTMODE – Enable Test Mode command in not signalling mode	SELINT 2

- "*TCH*"→starts the non-stop module transmission. It enables one Tx Slot (Note, edge not supported)
- "*TCH2*" →starts the non-stop module transmission. It enables two TX slots (Note, edge not supported)
- "*TQ <training_sequence>*"→ sets the training sequence; *<training_sequence>* has the range: 0 ÷ 7
- "*PL <power_lev>*"→ sets the Power Control Level for lower and upper bands; power_lev has the range: 0 ÷ 19
- "*PL2 <power_lev0> <power_lev1>*"→ sets the Power Control Level for both TX slots; power_lev0 is related to the first slot and power_lev1 to the second one; power_lev0 and power_lev1 has the range: 0 ÷ 19
- "RL" → Read Rx power level
- "ESC"→ exits the current non-stop sequence. It must be used to stop TCH/TCH2 transmission
- "*SetPCSBand <band>*"→ sets the PCS band;

band	Band
0	850/900/1800
1	850/900/1900

- "*CH <GSM_ETSI_Index>*"→ sets the ARFCH;

GSM_ETSI_Index	Band
1 ÷ 124	GSM (Standard Band)
975 ÷ 1023	E GSM (Extended Band)
955 ÷ 974	R GSM (Railway Band)
512 ÷ 885	DCS Band (1800 MHz)
512 ÷ 810	PCS Band (1900 MHz)
128 ÷ 251	GSM 850 (850 MHz)

3G Commands:

- "*INIT3G*"→ initialize Radio for 3G transmission
- "*TX3G*"→ starts the 3G module transmission if Radio is initialized (Default UARFCN UL is 9612 ansd power is -19.5 dBm)
- "PL3G <power> → change the 3G transmission power
  Power has the range -736 to 384 in sixteenths of dBm
- "CH3G *<uarfcn ul>*"→ change the 3G uarfcn ul on which to transmit or to receive. If TX3G is called previously CH3G sets a UARFCN for transmission, otherwise it will accept a channel for reception.

UMTS_UARFCN UL	Band
9612 ÷ 9888	1
9262 ÷ 9538	2

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#TESTMODE – Enable Test Mode command in not signalling mode		SELINT 2
	1312 ÷ 1513 | 4 4132 ÷ 4233 | 5 2712 ÷ 2863 | 8 UMTS_UARFCN DL | Band 10562 ÷ 10838 | 1 9662 ÷ 9938 | 2 1537 ÷ 1738 | 4 4357 ÷ 4458 | 5 2937 ÷ 3088 | 8 • "RL3G" → provides the Rx power level for the channel set with ""CH3G *<uarfcn dl>"* command. Note: - Bands support varies depending on the product - In Test Mode the transmission simultaneously on both 2g or 3g is not allowed Note 1: in Test Mode the other AT commands doesn't work. Note 2: in Test Mode the only allowed DTE speed is 115200 (see **+IPR**) Note 3: in Test Mode the multiplexing protocol control channel can't be enabled (see **+CMUX**) Note 4: after issuing AT#TESTMODE="TM" or "OM", the module reboots. Note 5: the Test Mode Status is stored in NVM Note 6: it's not possible to read RX power level during an ongoing TX	
AT#TESTMODE?	Read command reports the currently selected **<command>** in the format: **#TESTMODE: <TestModeStatus>** Where: **<TestModeStatus>** can assume the following values: - 1 if the module is in Test Mode - 0 if the module is in Operative Mode	
AT#TESTMODE=?	Test command returns the **OK** result code	

5.1.6.1.92. WCDMA domain selection - #WCDMADOM

#WCDMADOM – WCDMA domain selection		SELINT 2
AT#WCDMADOM=<dom>	This command selects the WCDMA domain.	

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	Parameter: **<dom>:** 0 – R4 1 – R5 (HSDPA) 2 – R6 (HSUPA) 3 – R7 (HSUPA & HSDPA) (default value) NOTE: The parameter **<dom>** is saved in NVM.
AT#WCDMADOM?	Read command reports the currently selected **<dom>** parameter in the format: **#WCDMADOM: <dom>**
AT#WCDMADOM=?	Test command reports the supported range of values for parameters **<dom>**.

5.1.6.1.93. Secure configuration - #SECCFG

#SECCFG – Secure configuration		SELINT 2
AT#SECCFG=<uea2>,<uia2>	This command enables/disables the UEA2 and UIA2 algorithms (R7). Parameter: **<uea2>:** 0 – disable UEA2 algorithm 1 – enable UEA2 algorithm **<uea1>:** 0 – disable UIA2 algorithm 1 – enable UIA2 algorithm NOTE: The parameters are saved in NVM.	
AT#SECCFG?	Read command reports the currently selected **<uea2>** parameters in the format: **#SECCFG: <uea2>,<uia2>**	
AT#SECCFG=?	Test command reports the supported range of values for parameters.	

5.1.6.1.94. System turn-off - #SYSHALT

#SYSHALT – system turn-off		SELINT 2
AT#SYSHALT[= <GPIO_restore>, <DTR_wakeup_en>, <Reboot_en>]	The module is turned off. It can be awaken by reset pin, alarm or DTR pin transition to low. Parameters: <GPIO_restore>: 0 – GPIOs and serial ports pins are left unchanged (default) 1 – GPIO and serial pins are set in input with pull down <DTR_wakeup_en>: 0 – DTR has no effect on module turned off by SYSHALT (default) 1 – DTR transition from high to low turns on again the module turned off by SYSHALT command <Reboot_en>: 0 – Module exits from SYSHALT and stays in detached mode like CFUN=4 status. In order to restore normal behaviour the user shall set CFUN=1 1 – Module exits from SYHALT performing a total reboot (default) Note: the command can be used both on serial port and on USB port. Please, pay attention on USB driver. In order to have a correct	

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	behaviour you need to have USB driver supporting selective suspend. The selective suspend must be enabled. If the module has been powered off through #SYSHALT any chars sent from USB is handled as a #SYSHALT wake up event. Insertion of USB cable is an event that wakes up the module turned off by #SYSHALT.
AT#SYSHALT?	Read command reports the default state of the parameters <GPIO_restore>, <DTR_wakeup_en> and <Reboot_en> in the format: #SYSHALT: 0,0,1
AT#SYSHALT=?	Test command reports supported range of values for all parameters.

5.1.6.1.95. Ciphering Indication - #CIPHIND

#CIPHIND – Ciphering Indication	**SELINT 2**
AT#CIPHIND =[<mode>]	Set command enables/disables unsolicited result code for cipher indication. The ciphering indicator feature allows to detect that ciphering is not switched on and to indicate this to the user. The ciphering indicator feature may be disabled by the home network operator setting data in the SIM/USIM. If this feature is not disabled by the SIM/USIM, then whenever a connection is in place, which is unenciphered, or changes from ciphered to unenciphered or vice versa, an unsolicited indication shall be given to the user. Parameter: **<mode>** 0 - disable #CIPHIND unsolicited result code (factory default) 1 - enable #CIPHIND unsolicited result code **#CIPHIND: <mode>**
AT#CIPHIND?	Read command reports the **<mode>**,**<cipher>** and **<SIM/USIM flag>**: **#CIPHIND: <mode>,<cipher>,<SIM/USIM flag>** where **<mode>** 0 - #CIPHIND unsolicited result code disabled 1 - #CIPHIND unsolicited result code enabled **<cipher>** - cipher status 0 – cipher off

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

5.1.6.1.96. CMUX Mode Set - #CMUXMODE

#CMUXMODE – CMUX Mode Set	SELINT 2
AT#CMUXMODE =<mode>[,<buffer_size>]	Set command specifies the CMUX mode Parameter: **<mode>:** 1 – Ignore DTR feature is disabled, a transition of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode and CFUN=1 5 – Ignore DTR feature is enabled, the DCE doesn't care the physical DTR line transitions (default) 13 – Ignore DTR feature is enabled, so the DCE will continue the CMUX session, but the transition of the physical DTR will be broadcasted to all opened logical channel. The behaviour of the particular channel depends on its own configuration, e.g. AT&D[<n>] **<buffer_size>:** If not set explicitly, the module preserves the previous value 0 – Disable the buffer_size limitation (default) 28 – 16384 Resize the internal cmux output buffer to the selected value. When a cmux session will be started using AT+CMUX, this value might be increased; if it is less than (N1 * 4), it becomes exactly N1 * 4. The current value can be gotten using the read command. The cmux out buffer contains the frames ready to be sent for every DLCI. If the modules receives an MSC indicating a RTS state to lock the data flow, these frames (already in the buffer) will be sent.

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#CMUXMODE – CMUX Mode Set	SELINT 2
	The default size of these buffer is about 32k. Note: a software or hardware reset restores the default value. Note: during a cmux session the set command will fail, only the read and test command can be used Note: **reducing the buffer_size will change the behaviour of cmux**. Several test have been performed using N1=122 at 115200bps => buffer_size = 488: - the bandwidth is decreased by 15% - the bandwidth is not equally distributed, the first channel has the max priority, then the second and the third Note: if the module is downloading a lot of data and the application processor lock the flow moving the logical RTS (with MSC), the module can send more than buffer_size data
AT#CMUXMODE?	Read command reports the currently selected **<mode>** in the format: **#CMUXMODE: <mode>,<buffer_size>**
AT#CMUXMODE =?	Test command reports the supported range of values for parameter **<mode>** and **<buffer_size>** Response: #CMUXMODE: (1,5,13),(0,28-16384)

5.1.6.1.97. Fast Dormancy - #FDOR

#FDOR– Fast dormancy	SELINT 2
AT#FDOR=<mode>[,<FDDelayTimer>[,<SCRITimer>]]	This command triggers fast dormancy; if all conditions are passed successful SCRI will be send towards the network. SCRI will be sent as a one shot or for every delay timer expiry, depending on the mode specified. Parameters: <mode>: 1 – indicate application driven (1 shot) Fast Dormancy to modem 2 – switch ON autonomous Fast Dormancy (AFD) 3 – switch OFF autonomous Fast Dormancy (AFD) – default value <FDDelayTimer>: 1..60 – integer value in seconds

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	<SCRITimer>: 0..120 – integer value in seconds Note: the setting of **<mode>** is not saved in NVM. The setting of timers is saved in NVM. Note: the reject cause from lower layers is reported by the unsolicited indication: #FDOR: <cause> where <cause> 0 - Reject is default cause. 1 - Reject because T323 timer is running 2 - Reject because Protocol Stack is in wrong states. 3 - Reject when No PS signalling connection exists. 4 - Reject when CS signalling connection exists. 5 - Reject when Protocol Stack component (RRC) procedures are running. 6 - Reject when Network deactivated FD, by not sending timer T323 in SIB1. 7 - Reject when from lower layers FD STOP Request is received. 8 - Reject when Protocol Stack component (PDCP) rejects the FD mode. 9 - FD Reject when Protocol Stack component (RLC) buffers are not EMPTY. 10 - Reject due to peer message received when FD procedure is running. 11 - Reject when there is no PAS RAB is established and if we receive FD_START_REQ. 12 - Reject due to cell_pch/ura_pch states when v316 is reached max limit. 13 - Reject due to ongoing/pending Emergency call. 14 - Reject due to ongoing Call re-establishment. 15 - Reject due to Establishment of Full rate TCH Channel. 16 - Reject due to Establishment of Half rate TCH Channel. 17 - Reject due to Establishment of Half rate TCH Channel for Data Transfer. 18 - Reject due to Location update. 19 - Reject due to MT Paging.

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	20 - Reject due to other causes, such as Ongoing SS transactions, etc. 21 - Reject due to an ongoing CS procedure while the cell does not support DTM. 22 - Reject due to Originating Conversational call. 23 - Reject due to Originating Streaming call. 24 - Reject due to Originating Interactive call. 25 - Reject due to Originating Background call. 26 - Reject due to Originating Subscribed Traffic call. 27 - Reject due to Terminating Conversational call. 28 - Reject due to Terminating Streaming call. 29 - Reject due to Terminating Interactive call. 30 - Reject due to Terminating Background call. 31 - Reject due to Inter RAT Cell Selection. 32 - Reject due to Inter RAT Cell Change 33 - Reject due to Registration. 34 - Reject due to Detach. 35 - Reject due to Originating Higher Priority.signalling. 36 - Reject due to Originating Low Priority.signalling. 37 - Reject due to Terminating Higher Priority.signalling. 38 - Reject due to Terminating Lower Priority.signalling. 39 -Reject due to Active RAT not being UMTS. 40 - Reject due to Access Stratum being Inactive/Searching. 41 - Reject due to RRC connection is not active. 42 - Reject due to Active Packet Switch connection.
AT#FDOR?	Read command returns "OK" string along with last accepted mode and timer values, in the format: #FDOR: <mode>,< FDDelayTimer >,< SCRITimer>
AT#FDOR=?	Test command returns "OK" string along with supported modes and timer values.

5.1.6.1.98. Enable Unsolicited Indication of Registration Messages - #REGIND

#REGIND – Enable Unsolicited Indication of Registration Messages	**SELINT 2**
AT#REGIND=<EnableProt>, <EnableInst>	This command enables/disables unsolicited indication of registration messages (Attach, Location Updating, Routing Area Update). Parameters: **<EnableProt>**

#REGIND – Enable Unsolicited Indication of Registration Messages	SELINT 2
	0 – disable unsolicited indication of registration messages at protocol level for all AT parser instances (factory default); 1 – enable unsolicited indication of registration messages at protocol level for all AT parser instances. **<EnableInst>** 0 – disable unsolicited indication of registration messages for current AT parser instances (factory default); 1 – enable unsolicited indication of registration messages for current AT parser instances. Note: the value **<EnableProt>** set by command is stored in the profile extended section and do not depend on the specific AT parser instance. It can be saved in NVM using AT&W and AT&P commands. Note: the value **<EnableInst>** set by command is stored in the profile extended section and depend on the specific AT parser instance. It can be saved in NVM using AT&W and AT&P commands. If enabled at protocol level and on current AT parser instance the following unsolicited indication of registration messages will be available: **#REGIND: <regType>,<regInfo>[,<regData>]** where: **<regType>** 0 – Attach 1 – Location Updating 2 – Routing Area Update **<regInfo>** 0 – Request 1 – Accept 2 – Reject 3 – Timer expiry 4 – Abnormal case **<regData>** Optional and present for the following messages only: Xxx Reject – reject cause number received in Xxx Reject message Note: unsolicited indication of registration messages is linked to message type exchanged with the Network and must not be used for registration status instead of AT+CREG, AT+CGREG, AT+CGATT. Note: timing of unsolicited indication of registration messages must not be compared to +CREG, +CGREG.
AT#REGIND?	Read command reports the currently stored parameters **<EnableProt>** and

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#REGIND – Enable Unsolicited Indication of Registration Messages	SELINT 2
	<EnableInst> in the format: **#REGIND: <EnableProt>,<EnableInst>**
AT#REGIND=?	Test command reports the supported range of values for parameters **<EnableProt>** and **<EnableInst>**.
Example	AT#REGIND=1,1 OK AT&W0&P0 OK reboot #REGIND: 1,0 #REGIND: 0,0 #REGIND: 0,1 #REGIND: 1,1 #REGIND: 2,0 #REGIND: 2,1

5.1.6.1.99. Enhanced Multi Level Procedure and Pre-emption - #XEMLPP

#XEMLPP – Enhanced Multi Level Procedure and Pre-emption	SELINT 2
AT#XEMLPP=<priority_level>	Set command specifies the priority level to use in subsequent mobile-originated speech calls: checks the requested priority level against the value on the USIM in EFeMLPP file and fails if the priority is not supported (see 3GPP TS 31.102). Parameter: **<priority_level>** : 0..4 - the value of priority 255 – no or default priority Note: the file EFeMLPP shall be present on the USIM if service 24° (Enhanced Multi-Level Precedence and Pre-emption service) is "available".

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AT#XEMLPP?	Read command returns the currently active priority level, in the format: **#XEMLPP: <priority_level>**
AT#XEMLPP=?	Test command reports the range of supported values for the <**priority_level**> parameter, in the format: **#XEMLPP: (0-4),255**

5.1.6.2. Easy Scan® Extension AT Commands

NOTE:

it is **mandatory** to issue all the Easy Scan® Extension AT commands with the module configured in +COPS: 2 mode, that is in detached mode, to avoid any potential conflict with normal module operations, such as "incoming call", "periodic location update, "periodic routing area update" and so on.
Any possible trigger of competing network activity must be deactivated. In this logic SIM toolkit must be deactivated.

5.1.6.2.1. Network Survey - #CSURV

#CSURV - Network Survey	SELINT 2
AT#CSURV[=[<s>,<e>]]	Execution command allows to perform a quick survey through band channels, starting from channel <s> to channel <e>. Issuing AT#CSURV<CR>, a full band scan is performed. Parameters: <s> - starting channel <e> - ending channel After issuing the command the device responds with the string: Network survey started… and, after a while, a list of informations, one for each received carrier, is reported, each of them in the format: *In 2G* (For BCCH-Carrier)

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#CSURV - Network Survey	SELINT 2
	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>]]] mstxpwr: <mstxpwr> rxaccmin: <rxaccmin> croffset: <croffset> penaltyt: <penaltyt> t3212: <t3212> CRH: <CRH><CR><LF><CR><LF><CR><LF> where: <arfcn> - the cell 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 at the most a 2-digits octal number <rxLev> - decimal number; it is the receiption level (in dBm) <ber> - decimal number; it is the bit error rate (in %) <mcc> - hexadecimal 3-digits number; it is the mobile country code <mnc> - hexadecimal 2-digits number; it is the mobile network code <lac> - location area code; if #CSURVF last setting is 0, <lac> is a decimal number, else it is a 4-digits hexadecimal number <cellId> - cell identifier; if #CSURVF last setting is 0, <cellId> is a decimal number, else it is a 4-digits hexadecimal number <cellStatus> - string type; it is the cell status ..CELL_SUITABLE - the cell is a suitable cell. CELL_LOW_PRIORITY - the cell is low priority based on the received system information. CELL_FORBIDDEN - the cell is forbidden. CELL_BARRED - the cell is barred based on the received system information. CELL_LOW_LEVEL - the cell <rxLev> is low. CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH available...etc. <numArfcn> - 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:

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#CSURV - Network Survey	SELINT 2

2. if **#CSURVEXT=0** this information is displayed only for serving cell
3. if **#CSURVEXT=1, 2** or **3** this information is displayed also for every valid scanned BCCH carrier.

<ban> - 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. if **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier.

(The following informations will be printed only if GPRS is supported in the cell)

<pbcch> - packet broadcast control channel
0 - pbcch not activated on the cell
1 - pbcch activated on the cell

<nom> - network operation mode
1
2
3

<rac> - routing area code
0..255 -

<spgc> - SPLIT_PG_CYCLE support
..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell
..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell

<pat> - priority access threshold
0 -
3..6 -

<nco> - network control order
0..2 -

<t3168> - timer 3168

<t3192> - timer 3192

<drxmax> - discontinuous reception max time (in seconds)

<ctrlAck> - packed control ack

<bsCVmax> - blocked sequenc countdown max value

<alpha> - alpha parameter for power control

<pcMeasCh> - type of channel which shall be used for downlink measurements for power control
0 - BCCH
1 - PDCH

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#CSURV - Network Survey	SELINT 2

(The following informations will be printed only for #CSURVEXT=3 setting)
<mstxpwr> - decimal TX power level
<rxaccmin> - decimal RX level access min, range 0 - 63
<croffset> - decimal Cell Reselection Offset, range 0 - 63
<penaltyt> - decimal Penalty Time, range 0 - 31
<t3212> - decimal T3212 Periodic Location Update Timer
<CRH> - decimal Cell Reselection Offset

(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

(For BCCH-Carrier)

uarfcn: <uarfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> scr code: <scrcode> cellId: <cellId> lac: <lac> cellStatus: <cellStatus> rscp: <rscp> ecio: <ecio>
<CR><LF><CR><LF><CR><LF>

where:
<uarfcn> - the cell carrier frequency designated by 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 8-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 - the cell 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

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#CSURV - Network Survey	SELINT 2
	information. CELL_LOW_LEVEL - the cell **<rxLev>** is low. CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH available...etc. **<rscp>** - decimal number; it is the RSCP level (in dBm) **<ecio>** - decimal number; it is the EC/IO ratio level (in dB) (For non BCCH-Carrier) **uarfcn: <uarfcn> rxLev: <rxLev>** where: **<uarfcn>** - decimal number; it is the RF channel **<rxLev>** - decimal number; it is the receiption level (in dBm) Lastly, the **#CSURV** output ends in two ways, depending on the last **#CSURVF** setting: if **#CSURVF=0** or **#CSURVF=1** The output ends with the string: **Network survey ended** if **#CSURVF=2** the output ends with the string: **Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)** where **<NoARFCN>** - number of scanned frequencies **<NoBCCH>** - number of found BCCh
Example	AT#CSURV Network survey started… arfcn: 36 bsic: 49 rxLev: -77 ber: 0.00 mcc: 222 mnc: 10 lac: 20060 cellId: 2716 2 cellStatus: CELL_SUITABLE numArfcn: 0 arfcn: numChannels: 0 array: pbcch: 0 no m: 0 rac: 0 spgc: 0 pat: 0 nco: 0 t3168: 0 t3192: 0 drxmax: 0 ctrlAck: 0 bsCVmax : 0 alpha: 0 pcMeasCh: 0 mstxpwr: 0 rxaccmin: 0 croffset: 0 penaltyt: 0 t3212: 0 CRH: 0 uarfcn: 10588 rxLev: -92 mcc: 222 mnc: 88 scr code: 54 cellId: 19406101 lac: 2406 5 cellStatus: CELL_SUITABLE rscp: -101 ecio: -9.0 Network survey ended

#CSURV - Network Survey	SELINT 2
	OK
Notes and Platform limits	This command execution takes a long time especially if the full band scan is performed. The module must be configured in +COPS: 2 mode. If present, the parameters: **<s>** - starting channel **<e>** - ending channel are only allowed in fixed couples indicating a band. Only BCCH-carriers are reported. Non BCCH-carriers are never reported. *In 2G* **<s>,<e>** fixed couples and the corresponding band, if supported by the product: 0,124 GSM900 975,1023 GSM900 512,885 DCS1800 128,251 GSM850 512,810 PCS1900 0,1023 all supported GSM bands **<ber>** is always 0.0. **<numArfcn>** is always 0. **<arfcn*n*>** is always empty. **<numChannels>** is always 0. **<ban>** is always empty. GPRS parameters like **<pbcch>** are printed only if GPRS is supported in the cell but their value is not available and will be always 0. Parameters like **<mstxpwr>** are printed only for #CSURVEXT=3 setting but their value is not available and will be always 0. *In 3G* **<s>,<e>** fixed couples and the corresponding band, if supported by the

#CSURV - Network Survey		SELINT 2
	product: 10562,10838 UMTS BAND I 9662,9938 UMTS BAND II 1537,1738 UMTS BAND IV 4357,4458 UMTS BAND V 4387,4413 UMTS BAND VI 2937,3088 UMTS BAND VIII 712,763 UMTS BAND XIX 0,65535 all supported UMTS bands	

5.1.6.2.2. Network Survey (Numeric Format) - #CSURVC

#CSURVC - Network Survey (Numeric Format)		SELINT 2
AT#CSURVC[= [<s>,<e>]]	Execution command allows to perform a quick survey through band channels, 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>]]],<mstxpwr>,<rxaccmin>,<croffset>,<penaltyt>,<t3212>,<CRH> <CR><LF><CR><LF><CR><LF> where: <arfcn> - the cell carrier assigned radio channel (BCCH - Broadcast Control Channel)	

#CSURVC - Network Survey (Numeric Format)	SELINT 2
	<bsic> - base station identification code; if **#CSURVF** last setting is 0, **<bsic>** is a decimal number, else it is **at the most** a 2-digits octal number **<rxLev>** - decimal number; it is the receiption level (in dBm) **<ber>** - decimal number; it is the bit error rate (in %) **<mcc>** - hexadecimal 3-digits number; it is the mobile country code **<mnc>** - hexadecimal 2-digits number; it is the mobile network code **<lac>** - location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number **<cellId>** - cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number **<cellStatus>** - string type; it is the cell status ..0 - the cell is a suitable cell (CELL_SUITABLE). 1 - the cell is low priority based on the received system information (CELL_LOW_PRIORITY). 2 - the cell is forbidden (CELL_FORBIDDEN). 3 - the cell is barred based on the received system information (CELL_BARRED). 4 - the cell **<rxLev>** is low (CELL_LOW_LEVEL). 5 - none of the above e.g. exclusion timer running, no BCCH available...etc.. (CELL_OTHER). **<numArfcn>** - decimal number; it is the number of valid channels in the Cell Channel Description **<arfcn*n*>** - decimal number; it is the arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**) **<numChannels>** - decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last **#CSURVEXT** setting: 1. if **#CSURVEXT=0** this information is displayed only for serving cell 2. if **#CSURVEXT=1, 2 or 3** this information is displayed also for every valid scanned BCCH carrier. **<ban>** - 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. if **#CSURVEXT=1, 2 or 3** this information is displayed also for every valid scanned BCCH carrier. *(The following informations will be printed only if GPRS is supported in the*

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#CSURVC - Network Survey (Numeric Format)	SELINT 2
	cell) **<pbcch>** - packet broadcast control channel 0 - pbcch not activated on the cell 1 - pbcch activated on the cell **<nom>** - network operation mode 1 2 3 **<rac>** - routing area code 0..255 - **<spgc>** - SPLIT_PG_CYCLE support ..0 - SPLIT_PG_CYCLE is not supported on CCCH on this cell ..1 - SPLIT_PG_CYCLE is supported on CCCH on this cell **<pat>** - priority access threshold 0 - 3..6 - **<nco>** - network control order 0..2 - **<t3168>** - timer 3168 **<t3192>** - timer 3192 **<drxmax>** - discontinuous reception max time (in seconds) **<ctrlAck>** - packed control ack **<bsCVmax>** - blocked sequenc countdown max value **<alpha>** - alpha parameter for power control **<pcMeasCh>** - type of channel which shall be used for downlink measurements for power control 0 - BCCH 1 - PDCH *(The following informations will be printed only for #CSURVEXT=3 setting)* **<mstxpwr> - decimal TX power level** **<rxaccmin> - decimal RX level access min, range 0 - 63** **<croffset> - decimal Cell Reselection Offset, range 0 - 63** **<penaltyt> - decimal Penalty Time, range 0 - 31** **<t3212> - decimal T3212 Periodic Location Update Timer** **<CRH> - decimal Cell Reselection Offset** **(For non BCCH-Carrier)** **<arfcn>,<rxLev>** where: **<arfcn>** - decimal number; it is the RF channel

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#CSURVC - Network Survey (Numeric Format)	SELINT 2

<rxLev> - decimal number; it is the receiption level (in dBm)

In 3G

(For BCCH-Carrier)

<uarfcn>,<rxLev>,<mcc>,<mnc>,<scrcode>,<cellId>,<lac>,<cellStatus>,<rscp>,<ecio>
<CR><LF><CR><LF><CR><LF>

where:
<uarfcn> - the cell carrier frequency designated by 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 8-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
0 - CELL_SUITABLE - the cell is a suitable cell.
1 - CELL_LOW_PRIORITY - the cell is low priority based on the received system information.
2 - CELL_FORBIDDEN - the cell is forbidden.
3 - CELL_BARRED - the cell is barred based on the received system information.
4 - CELL_LOW_LEVEL - the cell **<rxLev>** is low.
5 - CELL_OTHER - none of the above e.g. exclusion timer running, no BCCH available...etc.
<rscp> - decimal number; it is the RSCP level (in dBm)
<ecio> - decimal number; it is the EC/IO ratio level (in dB)

(For non BCCH-Carrier)

<uarfcn>,<rxLev>

where:
<uarfcn> - decimal number; it is the RF channel
<rxLev> - decimal number; it is the receiption level (in dBm)

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#CSURVC - Network Survey (Numeric Format)	SELINT 2
	The last information from **#CSURVC** depends on the last **#CSURVF** setting: **#CSURVF=0** or **#CSURVF=1** 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… 36,49,-80,0.00,222,10,20060,27162,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 10588,-92,222,88,54,19406101,24065,0-100,-8.0 Network survey ended OK
Notes and Platform limits	This command execution takes a long time especially if the full band scan is performed. 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. The module must be configured in +COPS: 2 mode. The limits described for **#CSURV** are also valid for **#CSURVC**.

5.1.6.2.3. Network Survey Format - #CSURVF

#CSURVF - Network Survey Format	SELINT 2
AT#CSURVF= [<format>]	Set command controls the format of the numbers output by all the Easy Scan® Parameter: **<format>** - numbers format 0 - Decimal

#CSURVF - Network Survey Format	SELINT 2
	1 - Hexadecimal values, no text 2 - Hexadecimal values with text
AT#CSURVF?	Read command reports the current number format, as follows: <format>
AT#CSURVF=?	Test command reports the supported range of values for the parameter <format>.

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

#CSURVNLF - <CR><LF> Removing On Easy Scan® Commands Family	SELINT 2
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 information 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>.

5.1.6.2.5. Extended network survey - #CSURVEXT

#CSURVEXT - Extended Network Survey	SELINT 2
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) display the BAList for every valid scanned BCCh carrier 2 - enables extended network survey; all the network survey execution commands (#CSURV, #CSURVC) 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

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#CSURVEXT - Extended Network Survey	SELINT 2
	BCCh 3 - enables more extended network survey; all the network survey execution commands (#CSURV, #CSURVC). It displays transmit power level, receiving level access min, Cell Reselection Offset, Penalty Time, T3212 Periodic Location Update Timer and Cell Reselection Offset
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>.
Notes and Platform limits	#CSURVEXT configuration has effect on 2G cells only.

5.1.6.3. AT Run Commands

5.1.6.3.1. Enable SMS Run AT Service - #SMSATRUN

#SMSATRUN – Enable SMS AT Run service	SELINT 2
AT#SMSATRUN= <mod>	Set command enables/disables the SMS AT RUN service. Parameter: **< mod >** 0: Service Disabled 1: Service Enabled Note1: When the service is active on a specific AT instance (see AT#SMSATRUNCFG), that instance cannot be used for any other scope, except for OTA service that has the highest priority. For example in the multiplexer request to establish the Instance, the request will be rejected. Note2: the current settings are stored in NVM.
AT#SMSATRUN?	Read command returns the current settings of <mode> and the value of <stat> in the format: **# SMSATRUN: <mod>,<stat>** where: **<stat>** - service status

#SMSATRUN – Enable SMS AT Run service	SELINT 2
	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.

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5.1.6.3.2. Set SMS Run AT Service parameters - #SMSATRUNCFG

#SMSATRUNCFG – Set SMS AT Run Parameters	SELINT 2
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 - 5, default 3. **<urcmod>:** 0 – disable unsolicited message 1 - enable an unsolicited message when an AT command is requested via SMS (default). When unsolicited is enabled, the AT Command requested via SMS is indicated to TE with unsolicited result code: #SMSATRUN: <Text> e.g.: #SMSATRUN: AT+CGMR;+CGSN;+GSN;+CCLK Unsolicited is dumped on the instance that requested the service activation. **<timeout>:** It defines in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. Range 1 – 60, default 5. Note 1: the current settings are stored in NVM. Note 2: the instance used for the SMS AT RUN service is the same used for the EvMoni service. Therefore, when the #SMSATRUNCFG sets the <instance> parameter, the change is reflected also in the <instance> parameter of the #ENAEVMONICFG command, and viceversa. Note 3: the set command returns ERROR if the command AT#ENAEVMONI? returns 1 as <mod> parameter or the command AT#SMSATRUN? returns 1 as <mod> parameter
AT#SMSATRUNCFG?	Read command returns the current settings of parameters in the format: **#SMSATRUNCFG:<instance>,<urcmod>,<timeout>**
AT#SMSATRUNCFG=?	Test command returns the supported values for the SMSATRUNCFG parameters

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5.1.6.3.3. SMS AT Run White List - #SMSATWL

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

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5.1.6.3.4. Set TCP Run AT Service parameter - #TCPATRUNCFG

#TCPATRUNCFG– Set TCP AT Run Service Parameters	SELINT 2
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 - 5. This parameter is mandatory. **<tcpPort>** Tcp Listen port for the connection to the service in server mode. Default 1024. Range 1...65535. This parameter is mandatory. **<tcpHostPort>** Tcp remote port of the Host to connect to, in client mode. Default 1024. Range 1...65535. This parameter is mandatory. **<tcpHost>** IP address of the Host, string type. This parameter can be either: - any valid IP address in the format: “xxx.xxx.xxx.xxx” - any host name to be solved with a DNS query This parameter is mandatory. Default “”. **<urcmod>:** 0 – disable unsolicited messages 1 - enable an unsolicited message when the TCP socket is connected or disconnect (default). When unsolicited is enabled, an asynchronous TCP Socket connection is indicated to TE with unsolicited result code: #TCPATRUN: <iphostaddress> When unsolicited is enabled, the TCP socket disconnection is indicated to TE with unsolicited result code: #TCPATRUN: <DISCONNECT> Unsolicited is dumped on the instance that requested the service activation. **<timeout>:**

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#TCPATRUNCFG– Set TCP AT Run Service Parameters	SELINT 2
	Define in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. The default value is 5 minutes. Range 1…5. **<authMode>:** determines the authentication procedure in server mode: 0 – (default) when connection is up, username and password (in this order and each of them followed by a Carriage Return) have to be sent to the module before the first AT command. 1 – when connection is up, the user receives a request for username and, if username is correct, a request for password. Then a message of ”Login successfull” 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. **<retryDelay>:** in client mode, delay between one attempt and the other. In minutes. Default: 2. Range 1…3600. Note2: the current settings are stored in NVM. Note3: to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see AT#SGACTCFG command). Note 4: the set command returns ERROR if the command AT#TCPATRUNL? returns 1 as <mod> parameter or the command AT# TCPATRUND? returns 1 as <mod> parameter
AT#TCPATRUNCFG?	Read command returns the current settings of parameters in the format: **#TCPATRUNCFG: <connId>,<instance>,<tcpPort>,<tcpHostPort>,<tcpHost>,<urcmod>,<timeout>,<authMode>,<retryCnt>,<retryDelay>**
AT#TCPATRUNCFG=?	Test command returns the supported values for the TCPATRUNCFG parameters

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

#TCPATRUNL– Enables TCP AT Run Service in listen (server) mode	**SELINT 2**
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 Note1: If SMSATRUN is active on the same instance (see AT#TCPATRUNCFG) the command will return ERROR. Note2: when the service is active it is on a specific AT instance (see AT#TCPATRUNCFG), that instance cannot be used for any other scope. For example, if the multiplexer requests to establish the Instance, the request will be rejected. Note3: the current settings are stored in NVM. Note4: 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

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5.1.6.3.6. TCP AT Run Firewall List - #TCPATRUNFRWL

#TCPATRUNFRWL – TCP AT Run Firewall List	SELINT 2
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 to be added into the **ACCEPT** chain; string type, it can be any valid IP address in the format: xxx.xxx.xxx.xxx **<net_mask>** - mask to be applied on the **<ip_addr>**; string type, it can be any valid IP address mask in the format: xxx.xxx.xxx.xxx Command returns **OK** result code if successful. Firewall general policy is **DROP**, therefore all packets that are not included into an **ACCEPT** chain rule will be silently discarded. When a packet comes from the IP address **incoming_IP**, the firewall chain rules will be scanned for matching with the following criteria: **incoming_IP & <net_mask> = <ip_addr> & <net_mask>** If 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. Note1: A maximum of 5 firewall can be present at same time in the List. Note2: the firewall list is saved in NVM
AT# TCPATRUNFRWL?	Read command reports the list of all **ACCEPT** chain rules registered in the Firewall settings in the format: **#TCPATRUNFRWL: <ip_addr>,<net_mask>** **#TCPATRUNFRWL: <ip_addr>,<net_mask>** **…** **OK**
AT#TCPATRUNFRWL=?	Test command returns the allowed values for parameter **<action>.**
Note	It will return ERROR if executed using SMSATRUN digest mode or TCPATRUN server mode

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5.1.6.3.7. TCP AT Run Authentication Parameters List - #TCPATRUNAUTH

#TCPATRUNAUTH – TCP AT Run Authentication Parameters List	**SELINT 2**
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. Note1: A maximum of 3 entry (password and userid) can be present at same time in the List. Note2: the Authentication Parameters List is saved in NVM.
AT#TCPATRUNAUTH?	Read command reports the list of all ACCEPT chain rules registered in the Authentication settings in the format: **#TCPATRUNAUTH: <user_id>,<passw>** **#TCPATRUNAUTH: <user_id>,<passw>** **….** **OK**
AT#TCPATRUNAUTH=?	Test command returns the allowed values for parameter **<action>**.

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

#TCPATRUND – Enables TCP Run AT Service in dial (client) mode	SELINT 2
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 Note1: If SMSATRUN is active on the same instance (see AT#TCPATRUNCFG) the command will return ERROR. Note2: when the service is active it is on a specific AT instance (see AT#TCPATRUNCFG), that instance cannot be used for any other scope. For example if the multiplexer request to establish the Instance, the request will be rejected. Note3: the current setting are stored in NVM Note4: to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see AT#SGACTCFG command). Note5: if the connection closes or at boot, if service is enabled and context is active, the module will try to reconnect for the number of attempts specified in AT#TCPATRUNCFG; also the delay between one attempt and the other will be the one specified in AT#TCPATRUNCFG.
AT#TCPATRUND?	Read command returns the current settings of <mode> and the value of <stat> in the format: **#TCPATRUND: <mod>,<stat>** where: **<stat>** - connection status 0 - not connected 1 – connected or connecting at socket level 2 - not connected but still trying to connect, attempting every delay time (specified in AT#TCPATRUNCFG)
AT#TCPATRUND =?	Test command returns the supported values for the TCPATRUND parameters

5.1.6.3.9. Closing TCP Run AT Socket - #TCPATRUNCLOSE

#TCPATRUNCLOSE – Closes TCP Run AT Socket	SELINT 2
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

5.1.6.3.10. TCP AT Run Command Sequence - #TCPATCMDSEQ

#TCPATCMDSEQ – For TCP Run AT Service, allows the user to give AT commands in sequence	SELINT 2
AT#TCPATCMDSEQ= <mod>	Set command enable/disable, for TCP Run AT service, a feature that allows giving more than one AT command without waiting for responses. It does not work with commands that uses the prompt '>' to receive the message body text (e.g. “at+cmgs”) Parameter: **< mod >** 0: Service Disabled (default) 1: Service Enabled
AT# TCPATCMDSEQ?	Read command returns the current settings of parameters in the format: **#TCPATCMDSEQ: <mod>**
AT# TCPATCMDSEQ =?	Test command returns the supported values for the TCPATCMDSEQ parameters

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

#TCPATCONSER – Connects the TCP Run AT service to a serial port	SELINT 2
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. Parameter: **< port >** 0 – USIF0 1 – USIF1 2 – USB0 3 – USB1 4 – USB2

#TCPATCONSER – Connects the TCP Run AT service to a serial port	SELINT 2
	5 – USB3 6 – SPI Not all of these ports will be available at the same time. The ports available will be displayed by the test command. They depend on the AT#PORTCFG command. Please refer to that AT command and to the "HE Family Ports Arrangements User Guide" for a detailed explanation of all port configurations **< rate >** baud rate for data transfer. Allowed values are 300,1200,2400,4800,9600,19200,38400,57600,115200. Note1: the command has to be issued from the TCP ATRUN instance Note2: After this command has been issued, if no error has occurred, then a "CONNECT" will be returned by the module to advise that the TCP ATRUN instance is in *online mode* and connected to the port specified. Note3: To exit from online mode and close the connection, the escape sequence (+++) has to be sent on the TCP ATRUN instance Note4: for USB ports and SPI the rate parameter is dummy
AT#TCPATCONSER =?	Test command returns the supported values for the TCPATCONSER parameters

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5.1.6.3.12. Run AT command execution - #ATRUNDELAY

#ATRUNDELAY – Set the delay on Run AT command execution	SELINT 2
AT#ATRUNDELAY= <srv>,<delay>	Set command enables the use of a delay before the execution of AT command received by Run AT service (TCP and SMS). It affects just AT commands given through Run AT service. **<srv>** 0 – TCP Run AT service 1 - SMS Run AT service **<delay>** Value of the delay, in seconds. Range 0..30. Default value 0 for both services (TCP and SMS). Note1 - 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. Note2: 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

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5.1.6.4. Consume commands

5.1.6.4.1. Configure consume parameters - #CONSUMECFG

#CONSUMECFG – configure consume parameters	**SELINT 2**
AT#CONSUMECFG=<rule_id>[,<service_type>[,<rule_enable>[,<period>[,<limit_amount>[,<action_id>]]]]]	This command sets the parameters related to the consume functionality Parameters: **<rule_id>** Index of the rule to apply to a defined **<service_type>** Range: (0-10) The available rules are 10 and their identifier ranges from 1 to 10. The special case of **<rule_id>**=0 is explained below in a note. **<service_type>** Type of service to count: 0 – No service (default) 1 – SMS Sent 2 – SMS Received 3 – Total SMS 4 – CS MO Calls 5 – CS MT Calls 6 – Total CS Calls 7 – IP All Data Sent 8 – IP All Data Received 9 – IP All Data 10 – IP All Data Sent (with Header) 11 – IP All Data Received (with Header) 12 – IP All Data (with Header) **<rule_enable>** Enable the counter on the rule 0 – rule disabled (default) 1 – rule enabled **<period>** Time period over which the service type data are counted: 0 – life (entire module life) (default) 1 – 8760 (hours) **<limit_amount>** Limit amount of data to count. 0 is default value and means no set limit: in this case only the counter is active. 0 – 4294967295 KBytes, for **<service_type>**=7,8,9,10,11 and 12 0 – 65535 number of SMS, for **<service_type>**=1,2, and 3 0 – 65535 minutes, for **<service_type>**=4,5 and 6

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	<action_id> Identifier of the action to trigger when the threshold limit has been reached. It corresponds to the AT command associated to the event CONSUMEX, where X=1,…5. (Refer to **#EVMONI** command) Range: (0-5); 0 means no action associated: in this case only the counter is active. Note: the Set command **#CONSUMECFG=0** has a special behaviour: for all the enabled rules, the data and time of related counters are reset (if they are not-life counters) Note: the values set by command are directly stored in NVM and don't depend on the specific AT instance Note: the life counters are disabled if <**enable**> parameter of **AT#ENACONSUME** is equal to 0 Note: a rule can be changed only setting **<rule_enable>**=0. The data and time of related counter are also reset (if it's not a life counter). Note: when the period expires, the counted data are reset, so the counting in the next period starts from 0. Note: if a service is blocked, then the related (life or not) counter is stopped also in terms of time (as well as in terms of data obviously).
AT#CONSUMECFG?	Read command returns the current settings for each rule in the format: **#CONSUMECFG: <rule_id>,<service_type>,<rule_enable>,<period>,<limit_amount>,<action_id>**
AT#CONSUMECFG=?	Test command reports the supported range of values for all parameters

5.1.6.4.2. Enable consume funztionality - #ENACONSUME

#ENACONSUME – enable consume functionality	**SELINT 2**
AT#ENACONSUME=<enable>[,<storing_mode>[,<storing_period>]]	Set command enables/disables the consume functionality. Parameters: **<enable>** 0 – disable consume functionality (default) 1 – disable consume functionality except life counters 2 – enable consume functionality

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

5.1.6.4.3. Report consume statistics - #STATSCONSUME

#STATSCONSUME – report consume statistics	**SELINT 2**
AT#STATSCONSUME[=<counter_type>]	Execution command reports the values of the life counters for every type of service or the values of period counters for every rule. Parameter: **<counter_type>** Type of counter: range (0-1) 0 – period counter: the command returns the values of period counters for

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

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	<service_1>,<life_data>,<current_time><CR><LF>#STATSCONSUME: **<service_2>,<life_data>,<current_time><CR><LF>…<CR><LF>#STATSCONSUME: <service_12>,<life_data>,<current_time>** where **<service_i>** is defined as **<service_type>** above **<life_data>** Number of data counted during entire life time period **<current_time>** Number of passed hours during entire life time period Note: issuing **AT#STATSCONSUME** without parameters has the same effect as **AT#STATSCONSUME**=0
AT#STATSCONSUME=?	Test command returns **OK** result code

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

#BLOCKCONSUME – block/unblock a type of service	**SELINT 2**
AT#BLOCKCONSUME=<service_type>,<block>	Execution command blocks/unblocks a type of service Parameter: **<service_type>** Type of service: 1 – SMS Sending 2 – SMS Receiving 3 – SMS Sending/ Receiving 4 – CS MO Calls 5 – CS MT Calls 6 – MO/MT CS Calls 7 – IP Data **<block>** 0 – unblock the service specified in **<service_type>** 1 – block the service specified in **<service_type>** Note: even if the service “SMS Received” has been blocked, an SMS ATRUN digest SMS can be received and managed. Note: the type of service 7 “IP Data” comprises all the IP services (i.e. IP ,with or without header, sent, receive and sent/receive data)

AT#BLOCKCONSUME?	Read command reports the status blocked/unblocked of every type of service in the following format: **#BLOCKCONSUME: <service_type>,<block>**
AT#BLOCKCONSUME=?	Test command reports the supported range of values for **<service_type>** and **<block>** parameters

5.1.6.4.5. #SGACT/#SSENDLINE configuration - #IPCONSUMECFG

#IPCONSUMECFG – #SGACT/#SSENDLINE configuration	**SELINT 2**
AT#IPCONSUMECFG= **[<connId>** **[,<txProt>** **[,<remoteHost>** **[,<remotePort>** **[,<authIMEI/ICCIDEna>** **[,<unused_A>** **[,<unused_B>** **[,<unused_C>** **]]]]]]]**	This command configures **#SGACT** authentication and **#SSENDLINE** connection parameters. Parameters: Following settings take effect on successive **#SSENDLINE** command: **<connId>: -** socket connection identifier 1(default)..6 Note: verify **<connId>** is currently available(i.e: not already connected) by multisocket commands(**#SD**,**#SL**,…) before entering successive **#SSENDLINE** command **<txProt> -** transmission protocol 0 – TCP(default) 1 – UDP **<remoteHost> -** address of the remote host, string type. This parameter can be either: - any valid IP address in the format: “xxx.xxx.xxx.xxx” - any host name to be solved with a DNS query. Default “” **<remotePort> -** remote host port to contact 1..65535 Default 1024 Following setting takes effect on successive **#SGACT** command: **<authIMEI/ICCIDEna> -** enables PDP context activation (#SGACT) authentication(user/pwd) with ICCID/IMEI 0 – disable **#SGACT** authentication with IMEI/ICCID as user/pwd(default)

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

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

#SSENDLINE – Open a connection,send data,close connection	**SELINT 2**
AT#SSENDLINE=<data>	This command permits to open a TCP/UDP connection, send specified data and close the TCP/UDP connection. The remote host/port of the connection have to be previously specified with **#IPCONSUMECFG** command. Parameters: **<data>** - text to send, shall be enclosed between double quotes. Note: maximum allowed amount of data is 380 octets Note: in case of UDP obviously only local opening/closure is done, datagram is sent with **<data>** contained in the payload.
AT#SSENDLINE=?	Test command reports the maximum length of **<data>** parameter

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

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	at#sgact=1,1
	#SGACT: xxx.xxx.xxx.xxx
	
	OK
	
	at#ssendline="test sample"
	// TCP connection with "remoteHost"/remotePort is opened ,
	// data between double quotes are sent,
	// then TCP connection is closed
	OK

5.1.6.5. Event Monitor Commands

5.1.6.5.1. Enable EvMoni Service - #ENAEVMONI

#ENAEVMONI – Enable EvMoni Service	**SELINT 2**
AT#ENAEVMONI= <mod>	Set command enables/disables the EvMoni service. Parameter: **< mod >** 0: Service Disabled (default) 1: Service Enabled Note1: When the service is active on a specific AT instance, that instance cannot be used for any other scope, except for OTA service that has the highest priority. For example in the multiplexer request to establish the Instance, the request will be rejected. Note2: 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

5.1.6.5.2. EvMoni Service parameter - #ENAEVMONICFG

#ENAEVMONICFG – Set EvMoni Service Parameters	SELINT 2
AT#ENAEVMONICFG=<instance>[,<urcmod>[,<timeout>]]	Set command configures the EvMoni service. Parameter: **<instance>:** AT instance that will be used by the service to run the AT Command. Range 1 - 5. (Default: 3) **<urcmod>:** 0 – disable unsolicited message 1 - enable an unsolicited message when an AT command is executed after an event is occurred (default) When unsolicited is enabled, the AT Command is indicated to TE with unsolicited result code: #EVMONI: <Text> e.g.: #EVMONI: AT+CGMR;+CGSN;+GSN;+CCLK Unsolicited is dumped on the instance that requested the service activation. **<timeout>:** It defines in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. (Default: 5) Note 1: the current settings are stored in NVM. Note 2: the instance used for the EvMoni service is the same used for the SMS AT RUN service. Therefore, when the #ENAEVMONICFG sets the <instance> parameter, the change is reflected also in the <instance> parameter of the #SMSATRUNCFG 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#ENAEVMONICFG?	Read command returns the current settings of parameters in the format: **#ENAEVMONICFG:<instance>,<urcmod>,<timeout>**
AT# ENAEVMONICFG =?	Test command returns the supported values for the ENAEVMONICFG parameters

5.1.6.5.3. Event Monitoring - #EVMONI

#EVMONI – Set the single Event Monitoring	**SELINT 2**
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 • CONSUME1 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME2 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME3 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME4 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) • CONSUME5 – used to define an action to be used in consume functionality (see parameter <action_id> in #CONSUMECFG command) **<mode>:** 0 – disable the single event monitoring (default) 1 – enable the single event monitoring **< paramType >:** numeric parameter indicating the type of parameter contained in **<param>**. The 0 value indicates that **<param>** contains the AT command string to

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#EVMONI – Set the single Event Monitoring	SELINT 2

execute when the related event has occurred. Other values depend from the type of event.

<param>: it can be a numeric or string value depending on the value of **<paramType>** and on the type of event.
If **<paramType>** is 0, then **<param>** is a string containing the AT command:

- It has to be enclosed between double quotes
- It has to start with the 2 chars AT (or at)
- If the string contains the character ", then it has to be replaced with the 3 characters \22
- the max string length is 96 characters
- if it is an empty string, then the AT command is erased

- If **<label>** is VBATT, **<paramType>** can assume values in the range 0 - 2.
  - 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)
  - 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.
  - if **<paramType>** = 1, **<param>** indicates the status high or low under monitoring. The values are 0 (low) and 1 (high). (Default: 0)
  - 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.
  - 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.
  - if **<paramType>** = 1, **<param>** indicates the GPIO pin number; supported range is from 1 to a value that depends on the hardware. (Default: 1)

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#EVMONI – Set the single Event Monitoring	SELINT 2

- if **<paramType>** = 2, **<param>** indicates the status high or low under monitoring. The values are 0 (low) and 1 (high) . (Default: 0)
- 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.
  - if **<paramType>** = 1, **<param>** indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. (Default: 1)
  - if **<paramType>** = 2, **<param>** indicates the ADC High voltage threshold in the range 0 – 2000 mV. (Default: 0)
  - 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.
  - if **<paramType>** = 1, **<param>** indicates the ADC pin number; supported range is from 1 to a value that depends on the hardware. (Default: 1)
  - if **<paramType>** = 2, **<param>** indicates the ADC Low voltage threshold in the range 0 – 2000 mV. (Default: 0)
  - 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.
  - 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
  - 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.
  - if **<paramType>** = 1, **<param>** indicates the text that must be received in incoming SMS to trigger AT command execution rings after that the event occurs; the maximum number of characters in the SMS text string is 15. If no text is specified, AT command execution is triggered after each incoming SMS
- If **<label>** is CONSUMEX, **<paramType>** can assume only the value 0.

Note: the DTMF string monitoring is available only if the DTMF decode has been enabled (see **#DTMF** command)

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#EVMONI – Set the single Event Monitoring	**SELINT 2**
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

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5.1.6.5.4. Send Message - #CMGS

#CMGS - Send Message	**SELINT 2**
(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 3GPP TS 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

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#CMGS - Send Message	**SELINT 2**
	IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) If message is successfully sent to the network, then the result is sent in the format: **#CMGS: <mr>** where **<mr>** - message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format. Note: if message sending fails for some reason, an error code is reported.
AT#CMGS=?	Test command resturns the **OK** result code.
Note	To avoid malfunctions is suggested to wait for the **#CMGS: <mr>** or **#CMS ERROR: <err>** response before issuing further commands.
Reference	3GPP TS 27.005

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5.1.6.5.5. Write Message To Memory - #CMGW

#CMGW - Write Message To Memory	**SELINT 2**
(PDU Mode) **AT#CMGW= <length>,<pdu>**	**(PDU Mode)** Execution command writes in the <**memw**> memory storage a new message. Parameter: <**length**> - length in bytes of the PDU to be written. 7..164 <**pdu**> - PDU in hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line. If message is successfully written in the memory, then the result is sent in the format: **#CMGW: <index>** where: <**index**> - message location index in the memory <**memw**>. If message storing fails for some reason, an error code is reported.
(Text Mode) **AT#CMGW=<da> ,<text>**	**(Text Mode)** Execution command writes in the <**memw**> memory storage a new message. Parameters: <**da**> - destination address, string type represented in the currently selected character set (see **+CSCS**). <**text**> - text to write The entered text should be enclosed between double quotes and formatted as follows: - if current <**dcs**> (see **+CSMP**) indicates that GSM03.38 default alphabet is used and current <**fo**> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to 3GPP TS 27.005, Annex A. - if current <**dcs**> (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current <**fo**> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the **'asterisk'** will be entered as **2A** (**IRA50** and **IRA65**) and this will be converted to an octet with integer value **0x2A**) If message is successfully written in the memory, then the result is sent in the format:

#CMGW - Write Message To Memory	SELINT 2
	#CMGW: <index> where: **<index>** - message location index in the memory **<memw>**. If message storing fails for some reason, an error code is reported.
AT#CMGW=?	Test command returns the **OK** result code.
Reference	3GPP TS 27.005
Note	To avoid malfunctions is suggested to wait for the **#CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

5.1.6.5.6. AT Command Delay - #ATDELAY

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

5.1.6.6. Multisocket AT Commands

5.1.6.6.1. Socket Status - #SS

#SS - Socket Status	**SELINT 2**
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 - Socket 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 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>**

#SS - Socket Status		SELINT 2
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	

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5.1.6.6.2. Socket Info - #SI

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

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#SI - Socket Info	SELINT 2
	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*

5.1.6.6.3. Socket Type - #ST

#ST – Socket Type	SELINT 2
AT#ST [=<ConnId>]	Set command reports the current type of the socket (TCP/UDP) and its direction (Dialer / Listener) Parameter: < **ConnId** > - socket connection identifier 1..6 The response format is: **#ST: <connId>,<type>,<direction>** where < **connId** > - socket connection identifier 1..6 < **type** > - socket type 0 – No socket 1 – TCP socket 2 – UDP socket < **direction** > - direction of the socket 0 – No 1 – Dialer 2 – Listener Note: issuing **#ST<CR>** causes getting information about type of all the sockets; the response format is: **#ST: <connId1>,<type1>,<direction1>** **<CR><LF>** … **#ST: <connId6>,< type 6>,< direction 6>**

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#ST – Socket Type	**SELINT 2**
AT#ST=?	Test command reports the range for parameter <connId>.
Example	single socket: AT#ST=3 #ST: 3,2,1 Socket 3 is an UDP dialer. All sockets: AT#ST #ST: 1,0,0 #ST: 2,0,0 #ST: 3,2,1 #ST: 4,2,2 #ST: 5,1,1 #ST: 6,1,2 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

5.1.6.6.4. Context Activation - #SGACT

#SGACT - Context Activation	**SELINT 2**
AT#SGACT=<cid>, <stat>[,<userId>, <pwd>]	Execution command is used to activate or deactivate either the GSM context or the specified PDP context. Parameters: **<cid>** - PDP context identifier 0 - specifies the GSM context (not yet available) 1..5 - numeric parameter which specifies a particular PDP context definition **<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**).

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#SGACT - Context Activation	SELINT 2
AT#SGACT?	Returns the state of all the contexts that have been defined **#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=?	Test command reports the range for the parameters **<cid>** and **<stat>**
Note	It is strongly recommended to use the same command (e.g. **#SGACT**) to activate the context, deactivate it and interrogate about its status.

5.1.6.6.5. Socket Shutdown - #SH

#SH - Socket Shutdown	SELINT 2
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>**.

5.1.6.6.6. Socket Configuration - #SCFG

#SCFG - Socket Configuration	SELINT 2
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 0 - specifies the GSM context 1..5 - numeric parameter which specifies a particular PDP context definition **<pktSz>** - packet size to be used by the TCP/UDP/IP stack for data sending. 0 - select automatically default value(300). 1..1500 - packet size in bytes. **<maxTo>** - exchange timeout (or socket inactivity timeout); if there's no data

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#SCFG - Socket Configuration	**SELINT 2**
	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; 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) 256 – set timeout value in 10 milliseconds 257 – set timeout value in 20 milliseconds 258 – set timeout value in 30 milliseconds 259 – set timeout value in 40 milliseconds 260 – set timeout value in 50 milliseconds 261 – set timeout value in 60 milliseconds 262 – set timeout value in 70 milliseconds 263 – set timeout value in 80 milliseconds 264 – set timeout value in 90 milliseconds Note: these values are automatically saved in NVM. 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

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5.1.6.6.7. Socket Configuration Extended - #SCFGEXT

#SCFGEXT - Socket Configuration Extended	SELINT 2
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> 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

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	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*<CR><LF>**
AT#SCFGEXT=?	Test command returns the range of supported values for all the subparameters.
Example	Socket 1 set with data view sring, text data mode, a keepalive time of 30 minutes and listen auto-response set. Socket 3 set with data amount sring, hex recv data mode, no keepalive and listen auto-response not set. Socket 4 set with hex recv and send data mode at#scfgext? #SCFGEXT: 1,2,0,30,1,0 #SCFGEXT: 2,0,0,0,0,0 #SCFGEXT: 3,1,1,0,0,0 #SCFGEXT: 4,0,1,0,0,1 #SCFGEXT: 5,0,0,0,0,0 #SCFGEXT: 6,0,0,0,0,0 OK

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5.1.6.6.8. 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 interrupt connection attempt 1 – It is possible to interrupt the connection attempt (<connTo> set by #SCFG or DNS resolution running if required) and give back control to AT interface by reception of a character. As soon as the control has been given to the AT interface the ERROR message will be received on the interface itself. Note: values are automatically saved in NVM. **<noCarrierMode>** - permits to choose **NO CARRIER**

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	indication format when the socket is closed as follows 0 – **NO CARRIER** (default) Indication is sent as usual, without additional information 1 – **NO CARRIER:<connId>** Indication of current **<connId>** socket connection identifier is added 2 – **NO CARRIER:<connId>,<cause>** Indication of current **<connId>** socket connection identifier and closure **<cause>** are added For possible **<cause>** values, see also **#SLASTCLOSURE** Note: like **#SLASTCLOSURE**, in case of subsequent consecutive closure causes are received, the original disconnection cause is indicated. Note: in the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data(#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.
AT#SCFGEXT2?	Read command returns the current socket extended configuration parameters values for all the six sockets, in the format: **#SCFGEXT2:<connId1>,<bufferStart1>,0,0,0,0<CR><LF>** **. . .** **#SCFGEXT2:<connId6>,<bufferStart6>,0,0,0,0<CR><LF>**
AT#SCFGEXT2=?	Test command returns the range of supported values for all the subparameters.
Example	AT#SCFGEXT2=1,1 OK AT#SCFGEXT2=2,1 OK AT#SCFGEXT2? #SCFGEXT2: 1,1,0,0,0,0 #SCFGEXT2: 2,1,0,0,0,0 #SCFGEXT2: 3,0,0,0,0,0 #SCFGEXT2: 4,0,0,0,0,0 #SCFGEXT2: 5,0,0,0,0,0

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	#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.

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5.1.6.6.9. Socket configuration Extended 3 - #SCFGEXT3

#SCFGEXT3 - Socket Configuration Extended 3	SELINT 2
AT#SCFGEXT3=<connId>,<immRsp>[,<closureTypeCmdModeEnabling>[,<fastsring>[,<unused_C>[,<unused_D>]]]]	Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command nor in #SCFGEXT2 command Parameters: **<connId>** - socket connection identifier 1..6 **<immRsp>** - Enables AT#SD command mode immediate response 0 – factory default, means that AT#SD in command mode (see **AT#SD**) returns after the socket is connected 1 – means that AT#SD in command mode returns immediately. Then the state of the connection can be read by the AT command **AT#SS** **<closureTypeCmdModeEnabling>** - Setting this parameter, successive #SD or #SL with **<closureType>** parameter 255 setting takes effect in command mode. It has been introduced due to retrocompatibility reason regarding **<closureType>** behaviour in command mode. 0 – factory default, #SD or #SL **<closureType>** 255 in command mode has no effect 1 – #SD or SL **<closureType>** 255 in command mode takes effect **<fastsring>** - Enables the fast SRING (active only when **AT#SCFGEXT** parameter **<srmode>**=2) in TCP and UDP sockets 0 – factory default, means that SRING unsolicited is received periodically if data are available every 200ms. 1 – means that if data are available SRING unsolicited is received asynchronous as fast as possible. Note: parameters are 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>, <closureTypeCmdModeEnabling>,<

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#SCFGEXT3 - Socket Configuration Extended 3	SELINT 2
	fastsring >,0,0<CR><LF> . . . #SCFGEXT3:<connId6>,<immRsp6>, <closureTypeCmdModeEnabling>, < fastsring >,0,0<CR><LF>
AT#SCFGEXT3=?	Test command returns the range of supported values for all the parameters.

5.1.6.6.10. Configure monosocket parameters - #APPSKTCFG

#APPSKTCFG – configure monosocket parameters	SELINT 2
AT#APPSKTCFG=<connTO>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>[,<UNUSED_4>]]]]	This command sets the parameters needed to monosocket services (FTP, SMTP, HTTP) Parameters: **<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 800) Note: values are automatically saved in NVM.
AT#APPSKTCFG?	Read command returns the current settings in the format: **#APPSKTCFG: <connTO>,0,0,0,0<CR><LF>**
AT#APPSKTCFG=?	Test command returns the range of supported values for all the parameters.

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5.1.6.6.11. Socket Dial - #SD

#SD - Socket Dial	SELINT 2
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 when remote host has closed 0 - local host closes immediately (default) 255 - local host closes after an AT#SH or immediately in case of an abortive disconnect from remote. **<lPort>** - UDP connections local port 1..65535 **<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**. 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

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#SD - Socket Dial		SELINT 2
	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. Note: **<closureType>** 255 takes effect on a command mode connection(**<connMode>** set to 1 or online mode connection suspended with +++) only if **#SCFGEXT3 <closureTypeCmdModeEnabling>** parameter has been previously enabled. Note: if PDP context has not properly opened through **#SGACT** (for instance: wrongly **+CGACT** command has been used), then +CME ERROR: 556(context not opened) will got	
AT#SD=?	Test command reports the range of values for all the parameters.	
Example	*Open socket 1 in online mode* AT#SD=1,0,80,"www.google.com",0,0,0 CONNECT … *Open socket 1 in command mode* AT#SD=1,0,80,"www.google.com",0,0,1 OK	

5.1.6.6.12. Socket Restore - #SO

#SO - Socket Restore		SELINT 2
AT#SO=<connId>	Execution command resumes the direct interface to a 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.	

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5.1.6.6.13. Socket Listen - #SL

#SL - Socket Listen	SELINT 2
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>** - 0 - closes socket listening 1 - starts socket listening **<listenPort>** - local listening port **1**..65535 **<closure type>** - socket closure behaviour for TCP when remote host has closed 0 - local host closes immediately (default) 255 - local host closes after an AT#SH or immediately in case of an abortive disconnect from remote. Note: if successful, the command returns a final result code **OK**. If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when a TCP connection request comes on the input port, if the sender is not filtered by internal firewall (see **#FRWL**), an URC is received: **+SRING : <connId>** Afterwards we can use **#SA** to accept the connection or **#SH** to refuse it. If the ListenAutoRsp flag has been set, then, when a TCP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**. If the socket is closed by the network the following URC is received: **#SL: ABORTED** Note: when closing the listening socket <listenPort> is a don't care Parameter Note: <closureType> 255 takes effect on a command mode connection (connection accepted through AT#SA=<connId>,1 or online mode connection suspended with +++) only if #SCFGEXT3 <closureTypeCmdModeEnabling> parameter has been previously enabled.
AT#SL?	Read command returns all the actual listening TCP sockets.

#SL - Socket Listen	SELINT 2
AT#SL=?	Test command returns the range of supported values for all the subparameters.
Example	*Next command opens a socket listening for TCP on port 3500 without.* AT#SL=1,1,3500 OK

5.1.6.6.14. Socket Listen UDP - #SLUDP

#SLUDP - Socket Listen UDP	SELINT 2
AT#SLUDP=<connId>, <listenState>, <listenPort>	This command opens/closes a socket listening for an incoming UDP connection on a specified port. Parameters: **<connId>** - socket connection identifier 1..6 **<listenState>** - 0 - closes socket listening 1 - starts socket listening **<listenPort>** - local listening port **1**..65535 Note: if successful, the command returns a final result code **OK**. If the ListenAutoRsp flag has not been set through the command AT#SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall (see **#FRWL**), an URC is received: **+SRING : <connId>** Afterwards we can use **#SA** to accept the connection or **#SH** to refuse it. If the ListenAutoRsp flag has been set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**. If the socket is closed by the network the following URC is received: **#SLUDP: ABORTED** Note: when closing the listening socket <listenPort> is a don't care parameter
AT#SLUDP?	Read command returns all the actual listening UDP sockets.

#SLUDP - Socket Listen UDP	SELINT 2
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

5.1.6.6.15. Socket Accept - #SA

#SA - Socket Accept	SELINT 2
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. **Note: setting the command before to having received a SRING will result in an ERROR indication, giving the information that a connection request has not yet been received**
AT#SA=?	Test command reports the range of values for all the parameters.

5.1.6.6.16. Socket Info Extended - #SIEXT

#SIEXT – Socket Info Extended	SELINT 2
AT#SIEXT[=<connId>]	Execution command is used to get information about socket data traffic. Parameters: **<connId>** - socket connection identifier 1..6 The response format is: **#SIEXT: <connId>,<retx>,<oos>,<rsrvd1>,<rsrvd2>** where: **<connId>** - socket connection identifier, as before

	<retx> - total amount of retransmissions of outgoing packets since the last time the socket connection identified by **<connId>** has been opened **<oos>** - total amount of ingoing out of sequence packets (packets which sequence number is greater than the next expected one) since the last time the socket connection identified by **<connId>** has been opened **<rsrvd1/2>** - reserved fields for future development of new statistics. Currently they're always equal to 0 Note: parameters associated with a socket identified by <connId> are cleared when the socket itself is connected again (#SD or #SA after #SL). Until then, if previous connection has been established and closed, old values are yet available. Note: both <retx> and <oos> parameters are available only for TCP connections; their value is always 0 for UDP connections. Note: issuing #SIEXT<CR> causes getting information about data traffic of all the sockets; the response format is: **#SI: <connId1>,<retx1>,<oos1>,<rsrvd1_1>,< rsrvd2_1><CR><LF>** **…** #SI: <connId6>,<retx6>,<oos6>,< rsrvd1_6>,< rsrvd2_6>
AT#SIEXT=?	Test command reports the range for parameter <connId>.

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

#SLASTCLOSURE – Detect the cause of a socket disconnection	**SELINT 2**
AT#SLASTCLOSURE= [<connId>]	Execution command reports socket disconnection cause Parameters: **<connId>** - socket connection identifier 1..6 The response format is: **#SLASTCLOSURE: <connId>,<cause>** where: **<connId>** - socket connection identifier, as before

	<**cause**> - socket disconnection cause: 0 – not available(socket has not yet been closed) 1.- remote host TCP connection close due to FIN/END: normal remote disconnection decided by the remote application 2 -.remote host TCP connection close due to RST, all others cases in which the socket is aborted without indication from peer (for instance because peer doesn't send ack after maximum number of retransmissions/peer is no more alive). All these cases include all the "FATAL" errors after recv or send on the TCP socket(named as different from EWOULDBLOCK) 3.- socket inactivity timeout 4.- network deactivation(PDP context deactivation from network) Note: any time socket is re-opened, last disconnection cause is reset. Command report 0(not available). Note: user closure cause(**#SH**) is not considered and if a user closure is performed after remote disconnection, remote disconnection cause remains saved and is not overwritten. Note: if more consecutive closure causes are received, the original disconnection cause is saved. (For instance: if a TCP FIN is received from remote and later a TCP RST because we continue to send data, FIN cause is saved and not overwritten) Note: also in case of <**closureType**>(**#SD**) set to 255, if the socket has not yet been closed by user after the escape sequence, **#SLASTCLOSURE** indicates remote disconnection cause if it has been received. Note: in case of UDP, cause 2 indicates abnormal(local) 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.

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AT#SLASTCLOSURE=?	Test command reports the supported range for parameter **<connId>**

5.1.6.6.18. Receive Data In Command Mode - #SRECV

#SRECV - Receive Data In Command Mode	**SELINT 2**
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>
Example	**SRING URC (<srMode> be 0, <dataMode> be 0)** *telling data have just come through connected socket identified by <connId>=1 and are now buffered* SRING: 1 *Read in text format the buffered data* AT#SRECV=1,15 #SRECV: 1,15 stringa di test OK *Or:* *if the received datagram, received from <IPaddr and <IPport> is of 60 bytes* AT#SRECV=1,15,1 #SRECV: <IPaddr>,<IPport>,1,15,45 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*

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#SRECV - Receive Data In Command Mode	SELINT 2
	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>,2,15,45 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

5.1.6.6.19. Send Data In Command Mode - #SSEND

#SSEND - Send Data In Command Mode	SELINT 2
AT#SSEND= <connId>	Execution command permits, while the module is in **command mode,** to send data through a connected socket. Parameters: **<connId>** - socket connection identifier 1..6 The device responds to the command with the prompt <greater_than><space> and waits for the data to send. To complete the operation send **Ctrl-Z** char (**0x1A** hex); to exit without writing the message send **ESC** char (**0x1B** hex). If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported Note: the maximum number of bytes to send is 1500 bytes ; trying to send more data will cause the surplus to be discarded and lost. Note: it's possible to use **#SSEND** only if the connection was opened by **#SD**, else

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#SSEND - Send Data In Command Mode	SELINT 2
	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*

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

#SSENDUDP – send UDP data to a specific remote host	SELINT 2
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 is restored as it was before.

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AT#SSENDUDP=?	Test command reports the supported range of values for parameters **<connId>**,**<remoteIP>** and **<remotePort>**
Example	*Starts listening on <LocPort> (previous setting of firewall through #FRWL has to be done)* AT#SLUDP=1,1,<LocPort> OK SRING: 1 // *UDP data from a remote host available* AT#SA=1,1 OK SRING: 1 AT#SI=1 #SI: 1,0,0,23,0 // *23 bytes to read* OK AT#SRECV=1,23 #SRECV:1,23 message from first host OK AT#SS=1 #SS: 1,2,<LocIP>,<LocPort>,<RemIP1>,<RemPort1> OK AT#SSENDUDP=1,<RemIP1>,<RemPort1> >response to first host OK SRING: 1 // *UDP data from a remote host available* AT#SI=1 #SI: 1,22,23,24,0 // *24 bytes to read* OK AT#SRECV=1,24 #SRECV:1,24 message from second host OK AT#SS=1 #SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2>

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	OK *Remote host has changed, we want to send a reponse:* **AT#SSENDUDP=1,<RemIP2>,<RemPort2>** **>response to second host** **OK**

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

#SSENDUDPEXT – send UDP data to a specific remote host extended	**SELINT 2**
AT#SSENDUDPEXT =<connId>,<bytestosend>, ,<remoteIP>,<remotePort>	This command permits, while the module is in command mode, to send data over UDP to a specific remote host including all possible octets(from 0x00 to 0xFF) As indicated about **#SSENDUDP**: UDP socket has to be previously opened through **#SLUDP** / **#SA**, then we are able to send data to different remote hosts Like **#SSENDEXT**, the device responds with the prompt '>' and waits for the data to send, operation is automatically completed when **<bytestosend>** have been sent. Parameters: **<connId>** - socket connection identifier 1..6 **<bytestosend>** - number of bytes to be sent 1-1500 **<remoteIP>** - IP address of the remote host in dotted decimal notation, string type: "xxx.xxx.xxx.xxx" **<remotePort>** - remote host port 1..65535
AT#SSENDUDPEXT=?	Test command reports the supported range of values for parameters **<connId>**,**<bytestosend>**,**<remoteIP>** and **<remotePort>**

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5.1.6.6.22. Send data in Command Mode extended - #SSENDEXT

#SSENDEXT - Send Data In Command Mode extended	**SELINT 2**
AT#SSENDEXT= <connId>, <bytestosend>	Execution command permits, while the module is in **command mode,** to send data through a connected socket including all possible octets (from 0x00 to 0xFF). Parameters: **<connId>** - socket connection identifier 1..6 **< bytestosend >** - number of bytes to be sent Please refer to test command for range The device responds to the command with the prompt <greater_than><space> and waits for the data to send. When <bytestosend> bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported. Note: it's possible to use **#SSENDEXT** only if the connection was opened by **#SD**, else the ME is raising an error. Note: all special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and don't behave like a BS, i.e. previous character is not deleted)
AT#SSENDEXT=?	Test command returns the range of supported values for parameters **< connId >** and **<bytestosend>**

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

5.1.6.6.23. IP Easy Authentication Type - #SGACTAUTH

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

5.1.6.6.24. Context activation and configuration - #SGACTCFG

#SGACTCFG - Context Activation and Configuration	SELINT 2
AT#SGACTCFG=<cid>,<retry>,[,<delay>[,<urcmode>]]	Execution command is used to enable or disable the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every GPRS Attach or after a NW PDP CONTEXT deactivation if at least one IPEasy socket is configured to this context (see AT#SCFG). Parameters: **<cid>** - PDP context identifier (see **+CGDCONT** command) 1..5 - numeric parameter which specifies a particular PDP context definition **<retry>** - numeric parameter which specifies the maximum number of context activation attempts in case of activation failure. The value belongs to the following range: 0 - 15 0 - disable the automatic activation/reactivation of the context (default) **<delay>** - numeric parameter which specifies the delay in seconds between an attempt and the next one. The value belongs to the following range: 180 - 3600 **< urcmode >** - URC presentation mode 0 - disable unsolicited result code (default) 1 - enable unsolicited result code, after an automatic activation/reactivation, of

	the local IP address obtained from the network. It has meaning only if <**auto**>=1. The unsolicited message is in the format: **#SGACT: <ip_address>** reporting the local IP address obtained from the network. Note: the URC presentation mode <**urcmode**> is related to the current AT instance only. Last <**urcmode**> setting is saved for every instance as extended profile parameter, thus it is possible to restore it even if the multiplexer control channel is released and set up, back and forth. Note: < **retry** > and <**delay**> setting are global parameter saved in NVM Note: if the automatic activation is enabled on a context, then it is not allowed to modify by the command AT#SCFG the association between the context itself and the socket connection identifier; all the other parameters of command AT#SCFG are modifiable while the socket is not connected
AT#SGACTCFG?	Read command reports the state of all the five contexts, in the format: **#SGACTCFG: <cid1>,<retry1>,<delay1>, < urcmode >CR><LF>** **…** **#SGACTCFG: <cid5>,<retry5>,<delay5>,< urcmode >** where: <**cid*n***> - as <**cid**> before <**retry*n***> - as <**retry**> before <**delay*n***> - as <**delay**> before < **urcmode** > - as < **urcmode** > before
AT#SGACTCFG=?	Test command reports supported range of values for parameters <**cid**> >,<**retry**>,<**delay**>and < **urcmode** >

5.1.6.6.25. Context activation and configuration extended - #SGACTCFGEXT

#SGACTCFGEXT - context activation configuration extended	SELINT 2
AT#SGACTCFGEXT= <cid>, <abortAttemptEnable> [,<unused> [,<unused> [,<unused>]]]	Execution command is used to enable new features related to context activation. Parameters: **<cid>** - PDP context identifier (see **+CGDCONT** command) 1..5 - numeric parameter which specifies a particular PDP context definition **< abortAttemptEnable >** 0 – old behaviour: no abort possible while attempting context activation 1 – abort during context activation attempt is possible by sending a byte on the serial port. It takes effect on successive GPRS context activation attempt through #SGACT command in the following manner. While waiting for AT#SGACT=<cid>,1 response(up to 150 s) is possible to abort attempt by sending a byte and get back AT interface control(NO CARRIER indication). Note: If we receive delayed CTXT ACTIVATION ACCEPT after abort, network will be automatically informed of our aborted attempt through relative protocol messages(SM STATUS) and will also close on its side. Otherwise, if no ACCEPT is received after abort, network will be informed later of our PDP state through other protocol messages (routing area update for instance).
AT#SGACTCFGEXT?	Read command reports the state of all the five contexts, in the format: **#SGACTCFGEXT: <cid1>,< abortAttemptEnable1 >,0,0,0<CR><LF>** **…** **#SGACTCFGEXT: <cid5>,< abortAttemptEnable5 >,0,0,0<CR><LF>** where: **<cid*n*>** - as **<cid>** before **< abortAttemptEnable *n*>** - as **< abortAttemptEnable >** before Note: values are automatically saved in NVM.
AT#SGACTCFGEXT=?	Test command reports supported range of values for all parameters

5.1.6.6.26. PAD command features - #PADCMD

#PADCMD – PAD command features	SELINT 2
AT#PADCMD=<mode>	This command sets features of the pending data flush to socket, opened with AT#SD command. Parameters: **<mode>:** Bit 1: 1 - enable forwarding; 0 – disable forwarding; Other bits reserved; Note: forwarding depends on character defined by AT#PADFWD
AT#PADCMD?	Read command reports the currently selected **<mode>** in the format: **#PADCMD: mode**
AT#PADCMD=?	Test command reports the supported range of values for parameter **<mode>**.

5.1.6.6.27. PAD forward character - #PADFWD

#PADFWD – PAD forward character	SELINT 2
AT#PADFWD=<char> [,<mode>]	This command sets the char that immediately flushes pending data to socket, opened with AT#SD command. Parameters: **<char>:** a number, from 0 to 255, that specifies the asci code of the char used to flush data **<mode>:** flush mode, 0 – normal mode (default); 1 – reserved; Note: use AT#PADCMD to enable the socket char-flush activity.
AT#PADFWD?	Read command reports the currently selected **<char>** and **<mode>** in the format: **#PADFWD: <char>,mode**
AT#PADFWD=?	Test command reports the supported range of values for parameters **<char>** and **<mode>**.

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

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

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	one, to distinguish EOF condition. (Base64 encoding rules) For the same reason if #SRECV command is used by the application to receive data, a multiple of 78 bytes has to be considered. Note: to use #SRECV to receive data with <dec> enabled, it is necessary to consider that: reading <maxByte> bytes from socket, user will get less due to decoding that is performed. Note: values are automatically saved in NVM.
AT#BASE64?	Read command returns the current <enc>/<dec> settings for all the six sockets, in the format: **#BASE64:<connId1><enc1>,<dec1>,0,0<CR><LF>** **. . .** **#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>**
AT#BASE64=?	Test command returns the range of supported values for all the subparameters.

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

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

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5.1.6.6.29. SSL Commands

5.1.6.6.29.1. Open a socket SSL to a remote server - #SSLD

#SSLD – Opens a socket SSL to a remote server	SELINT 2
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> - 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> - 0 – only value 0 supported <connMode> - connection mode 0 – online mode connection. 1 – command mode connection (factory default). <Timeout> - time-out in 100 ms units. It represents the maximum allowed TCP inter-packet delay. It means that, when more data is expected during the handshake, the module awaits <Timeout> * 100 msecs for the next packet. If no more data can be read, the module gives up the handshake and raises an ERROR response. Note: IT'S NOT the total handshake timeout or, in other words, it's not the absolute maximum time between the #SSLD issue and the CONNECT/OK/ERROR response. Though by changing this parameter you can limit the handshake duration (for example in case of congested network or busy server), there's no way to be sure to get the command response within a certain amount of time, because it depends on the TCP connection time, the handshake time and the computation time (which depends on the

	authentication mode and on the size of keys and certificates). **10..5000 - hundreds of ms (factory default is 100)** **Note: if secure socket is not enabled 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: 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: 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 #SSLD has been issued with <connMode> set to command mode connection), these data are buffered and we receive the SSLSRING URC (if any of its presentation formats have been enabled by means the #SSLCFG command); it's possible to read these data afterwards issuing #SSLRECV. Under the same hypotheses it's possible to send data while in command mode issuing #SSLSEND.** **Note: Before opening a SSL connection the GPRS context must have been activated by AT#SGACT=x,1.** **Note: Before opening a SSL connection, make sure to have stored the needed secure data (CA certificate), using AT#SSLSECDATA.** **Note: in case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid #SSLSECDATA command.**
AT#SSLD=?	**Test command returns the range of supported values for all the parameters:** **#SSLD: (1),(1-65535),,(0),(0,1),(10-5000)**

5.1.6.6.29.2. Enable a SSL socket - #SSLEN

#SSLEN – Enable a SSL socket		**SELINT 2**
AT#SSLEN=<SSId>, <Enable>	This command enables a socket secured by SSL	

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

5.1.6.6.29.3. Close a SSL socket - #SSLH

#SSLH – Close a SSL socket	SELINT 2
AT#SSLH=<SSId>[, <ClosureType>]	This command allows closing the SSL connection. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. **< ClosureType >:** 0 – only value 0 is supported Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made.
AT#SSLH=?	Test command returns the range of supported values for all the parameters: **#SSLH: (1),(0)**

5.1.6.6.29.4. Restore a SSL socket after a +++ - #SSLO

#SSLO – Restore a SSL socket after a +++	SELINT 2
AT#SSLO=<SSId>	This command allows to restore a SSL connection (online mode) suspended by an escape sequence (+++). After the connection restore, the **CONNECT** message is printed. Please note that this is possible even if the connection has been started in command mode (#SSLD with <connMode> parameter set to 1). Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: Before opening a SSL connection the GPRS context must have been activated by **AT#SGACT=X,1**. Note: if an error occur during reconnection the socket 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)**

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5.1.6.6.29.5. Read Data from a SSL socket - #SSLRECV

#SSLRECV – Read data from a SSL socket	SELINT 2
AT#SSLRECV=<SSId>, <MaxNumByte> [,<TimeOut>]	This command allows receiving data arrived through a connected secure socket, but buffered and not yet read because the module entered command mode before reading them. The module can be notified of these data by a SSLSRING URC, which enabling and presentation format depends on last #SSLCFG setting. Parameters: <SSId> - Secure Socket Identifier 1 - Until now SSL block manage only one socket. <MaxNumByte> - max number of bytes to read 1..1000 < Timeout > - time-out in 100 ms units 1..5000 - hundreds of ms (factory default is 100) If no data are received the device respondes: #SSLRECV: 0<CR><LF> TIMEOUT<CR><LF> <CR><LF> OK If the remote host closes the connection the device respondes: #SSLRECV: 0<CR><LF> DISCONNECTED<CR><LF> <CR><LF> OK If data are received the device respondes: #SSLRECV: NumByteRead<CR><LF> ...(Data read)... <CR><LF> <CR><LF> OK Note: if secure socket is not enabled using AT#SSLEN only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set through AT#SSLCFG, is used. Note: before receiving data from the SSL connection it has to be established using AT#SSLD.
AT#SSLRECV=?	Test command returns the range of supported values for all the

	parameters: **#SSLRECV: (1),(1-1000),(10-5000)**

5.1.6.6.29.6. Report the status of a SSL socket - #SSLS

#SSLS – Report the status of a SSL socket	**SELINT 2**
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>** otherwise: **#SSLS: <SSId>,<ConnectionStatus>** Where **<CipherSuite>** can be as follows: 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 5 - TLS_RSA_WITH_AES_256_CBC_SHA 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)

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5.1.6.6.29.7. Manage the security data - #SSLSECDATA

#SSLSECDATA – Manage the security data	SELINT 2
AT#SSLSECDATA =<SSId>,<Action>, <DataType>[,<Size>]	This command allows to store, delete and read security data (Certificate, CAcertificate, private key) into NVM. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manages only one socket. **<Action>** - Action to do. 0 – Delete data from NVM. 1 – Store data into NVM. 2 – Read data from NVM . **<DataType>** 0 – Certificate 1 – CA certificate 2 - RSA Private key **<Size>** - Size of security data to be stored 1..4000 If the **<Action> parameter** is 1 (store data into NVM) the device responds to the command with the prompt '>' and waits for the data to store. Note: secured data have to be in PEM or in DER format, depending on **< cert_format >** chosen with **#SSLSECCFG**. If no **< cert_format>** has been specified with **#SSLSECCFG**, PEM format is assumed. PEM format(see **#SSLSECCFG** command):To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex). DER format(see **#SSLSECCFG** command):: When <size> bytes are entered, the certificate is automatically stored. ESC or Ctrl-Z don't take effect, because they are considered as possible octets contained in the certificate. If data are successfully stored, then the response is OK; if it fails for some reason, an error code is reported. If the **<Action>** parameter is 2 (read data from NVM), data specified by **<DataType>** parameter is shown in the following format: **#SSLSECDATA: <connId>,<DataType>**

	<DATA> **OK** If **<DataType>** data has not been stored (or it has been deleted) the response has the following format: **#SSLSECDATA: <connId>,<DataType>** **No data stored** **OK** Note: **<size>** parameter is mandatory if the <write> action is issued, but it has to be omitted for <delete> or <read> actions are issued. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: If socket is connected an error code is reported. Note: in case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid **#SSLSECDATA** command.
AT#SSLSECDATA?	Read command reports what security data are stored in the format: **#SSLSECDATA: <SSId 1>,<CertIsSet>,<CAcertIsSet>,<PrivKeyIsSet>** <CertIsSet>, <CAcertIsSet>, <PrivKeyIsset> are 1 if related data are stored into NVM otherwise 0.
AT#SSLSECDATA =?	Test command returns the range of supported values for all the parameters: **#SSLSECDATA: (1),(0-2), ,(0-2),(1-4000)**

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5.1.6.6.29.8. Send data through a SSL socket - #SSLSEND

#SSLSEND – Send data through a SSL socket	SELINT 2
AT#SSLSEND=<SSId>[, < Timeout >]	This command allows sending data through a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. **< Timeout > - socket send timeout**, in 100 ms units. 1..5000 - hundreds of ms (factory default is 100) The device responds to the command with the prompt '>' and waits for the data to send. To complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex). If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported Note: the maximum number of bytes to send is 1023; 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**.
AT#SSLSEND=?	Test command returns the range of supported values for all the parameters: **#SSLSEND: (1),(1-5000)**

5.1.6.6.29.9. Send data through a secure sockect in Command Mode - #SSLSENDEXT

#SSLSENDEXT – Send data through a secure socket in Command Mode extended	SELINT 2
AT#SSLSENDEXT= <SSId>,<bytestosend>[, <Timeout>]	This command allows sending data through a secure socket. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manage only one socket. **<bytestosend>** - number of bytes to be sent Please refer to test command for range **<Timeout>** - time-out in 100 ms units 1..5000 - hundreds of ms (factory default is 100) The device responds to the command with the prompt '>' <greater_than><space> and waits for the data to send. When **<bytestosend>** bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported. Note: if secure socket is not enabled using **AT#SSLEN** only test requests can be made. Note: if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG,** is used. Note: Before sending data through the SSL connection it has to be established using **AT#SSLD.** Note: all special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and don't behave like a BS, i.e. previous character is not deleted).
AT#SSLSENDEXT =?	Test command returns the range of supported values for parameters **<SSId>** , **<bytestosend>** and **<Timeout>**. **#SSLSENDEXT: (1),(1-1500),(1-5000)**
Example	Open the socket in command mode: at#ssld=1,443,<port>,"IP address",0,1 OK Give the command specifying total number of bytes as second

	parameter: at#sslsendext=1,256,100

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

#SSLSECCFG – Configure security parameters of a SSL socket	**SELINT 2**
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 5 - TLS_RSA_WITH_AES_256_CBC_SHA Note: when o value is chosen, cipher suites supported are indicated to the server within TLS handshake (i.e.: client hello) as follows: TLS_RSA_WITH_AES_256_CBC_SHA TLS_RSA_WITH_AES_128_CBC_SHA TLS_RSA_WITH_RC4_128_SHA TLS_RSA_WITH_RC4_128_MD5 Note: TLS_RSA_WITH_NULL_SHA is not included as default(0), but it is possible to set it(4) if required. **<auth_mode>** 0 – SSL Verify None[default] 1 – Manage server authentication 2 – Manage server and client authentication if requested by the remote server **<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

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	doesn't return the setting of the format in order to meet retro compatibility with other families. Now, let's assume that **AT#SSLSECCFG** command is entered again, but using the **<cert_format>** parameter for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the **<cert_format>** is omitted, the **AT#SSLSECCFG?** read command reports the parameter value entered the last time. Note: Server CAcertificate has to be stored through **AT#SSLSECDATA**. Note: if secure socket is not enabled using **#SSLEN** only test requests can be made. Read command can be issued if at least a **<SSId>** is enabled. Note: these values are automatically saved in NVM.
AT#SSLSECCFG?	Read command reports the currently selected parameters in the format: **#SSLSECCFG: <SSId1>,<CipherSuite>,<auth_mode>[,<cert_format>]**
AT#SSLSECCFG=?	Test command returns the range of supported values for all the parameters.

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

#SSLSECCFG2 – Configure additional parameters of a SSL socket	SELINT 2
AT#SSLSECCFG2= <SSId>, <version> [,<unused_A> [,<unused_B> [,<unused_C> [,<unused_D>]]]]	This command allows configuring additional SSL connection parameters. Parameters: <SSId> - Secure Socket Identifier 1 – Until now SSL block manage only one socket <version> - SSL/TLS protocol version (default is 1, i.e.: TLSv1.0) 0 – protocol version SSLv3 1 – protocol version TLSv1.0 2 – protocol version TLSv1.1 Note: parameter is automatically saved in NVM
AT#SSLSECCFG2?	Read command reports the currently selected parameters in the format: #SSLSECCFG2: <SSId>,<version>,0,0,0,0

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AT#SSLSECCFG2=?	Test command reports the range of supported values for all the parameters

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

#SSLCFG – Configure general parameters of a SSL socket	SELINT 2
AT#SSLCFG=<SSId>, <cid>,<pktSz>, <maxTo>, <defTo>,<txTo>[, <sslSRingMode>[, <noCarrierMode>[, <UNUSED_1>[, <UNUSED_2>]]]]	This command allows configuring SSL connection parameters. Parameters: <**SSId**> - Secure Socket Identifier 1 - Until now SSL block manages only one socket <**cid**> - PDP Context Identifier. 1 - 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.) <**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). <sslSRingMode> - sslSRing unsolicited mode. 0 – SSLSRING disabled 1 – SSLSRING enabled in the format SSLSRING: <SSId>,<recData> where <SSId> is the secure socket identifier and <recData> is the amount of data received and decoded by the SSL socket. A new unsolicited is sent whenever the amount of data ready to be read changes. Only a record is decoded at once so, any further record is received and decoded only after the first have been read by the user by means of the #SSLRECV command. 2 – SSLSRING enabled in the format

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	SSLSRING: <SSId>,<dataLen>,<data> where <SSId> is the secure socket identifier, <dataLen> is the length of the current chunk of data (the minimum value between the available bytes and 1300) and <data> is data received (<dataLen> bytes) displayed in ASCII format. **<noCarrierMode>** - this parameter permits to choose NO CARRIER indication format when the secure socket is closed as follows: 0 – **NO CARRIER** (default) Indication is sent as usual, without additional information 1 – **NO CARRIER:SSL,<SSId>** Indication of current **<SSId>** secure socket connection is added. The fixed "SSL" string allows the user to distinguish secure sockets from TCP sockets 2 – **NO CARRIER:SSL,<SSId>,<cause>** Indication of current **<SSId>** secure socket connection and closure **<cause>** are added. Following the possible **<cause>** values are listed: 0 – not available (secure socket has not yet been closed 1 – the remote TCP connection has been closed (RST, or any fatal error in send/recv are all included within this case) 2 – socket inactivity timeout 3 – network deactivation (PDP context deactivation from network) 4 – SSL "Close Notify Alert" message has been received 5 – the remote TCP connection has been closed(FIN) after all data have been retrieved from socket 6 – Closure due to any other SSL alert different from the previous ones. Note: if secure socket is not enabled using **#SSLEN** only test requests can be made. Read command can be issued if at least a <SSId> is enabled. Note: these parameters cannot be changed if the secure socket is connected. Note: these values are automatically saved in NVM.
AT#SSLCFG?	Read command reports the currently selected parameters in the format:

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	#SSLCFG: <SSId1>,<cid>,<pktSz>,<maxTo>,<defTo><txTo>,<sslSRingMode>,<noCarrierMode>,0,0
AT#SSLCFG=?	Test command returns the range of supported values for all the parameters. **#SSLCFG: (1),(1),(0-1500),(0-65535),(10-5000),(0-255),(0),(0),(0),(0)**

5.1.6.6.29.13. Secure Socket Info - # SSLI

#SSLI – Secure Socket Info	**SELINT 2**
AT#SSLI[=<SSId>]	Execution command is used to get information about secure socket data traffic. Parameters: **<SSId>** - Secure Socket Identifier 1 - Until now SSL block manages only one socket The response format is: **#SSLI: <SSId>,<DataSent>,<DataRecv>,<PendingData>,<TCPConnWaitingAck>** where: **<SSId>** - secure socket connection identifier, as before **<DataSent> -** total amount(in bytes) of data sent to the TLS/SSL connection since the beginning of the connection itself (obviously: not yet encoded into TLS/SSL record) **<DataRecv> -** total number of bytes received from the TLS/SSL connection since the beginning of the connection itself (obviously: already decoded from TLS/SSL record) **<PendingData> -** number of bytes available to be read from the TLS/SSL record that is currently being processed (obviously: already decoded from TLS/SSL record) **<TCPConnWaitingAck> -** indication of the underlying TCP socket condition, if there are TCP/IP packets sent but not yet acknowledged or not 0 – no TCP/IP packets sent waiting for ack 1 – yes TCP/IP packets sent waiting for ack
AT#SSLI=?	Test command returns the range of supported values for all the parameters.

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#SSLI – Secure Socket Info		SELINT 2
	#SSLS: (1)	

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5.1.6.7. FTP AT Commands

5.1.6.7.1. FTP Time-Out - #FTPTO

#FTPTO - FTP Time-Out	SELINT 2
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>**

5.1.6.7.2. FTP Open - #FTPOPEN

#FTPOPEN - FTP Open	SELINT 2
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: Before opening an FTP connection either the GSM context must have been activated by **AT#SGACT=0,1** or the PDP context #1 must have been activated by **AT#SGACT=1,1** or by **AT#GPRS=1**
AT#FTPOPEN=?	Test command returns the **OK** result code.

5.1.6.7.3. FTP Close - #FTPCLOSE

#FTPCLOSE - FTP Close	SELINT 2
AT#FTPCLOSE	Execution command closes an FTP connection.
AT#FTPCLOSE=?	Test command returns the **OK** result code.

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5.1.6.7.4. FTP Config - #FTPCFG

#FTPCFG – description	SELINT 2
AT#FTPCFG=<tout>,<IPPignoring>[,<FTPSEn>]	**<tout>** - time-out in 100 ms units 100..5000 - hundreds of ms (factory default is 100) Set command sets the time-out used when opening either the FTP control channel or the FTP traffic channel. Note: The parameter is not saved in NVM. **<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. 1 – Enable FTPS security: from now on any FTP session opened through FTP commands will be compliant to FTPS protocol, providing authentication and encrypted communication. Note: in FTPS mode, FTP commands response time is generally bigger than in normal FTP mode. This latency is mainly due to the SSL handshake that has to be done at the opening of the FTP session (#FTPOPEN) and whenever a data exchange is required (#FTPPUT, #FTPGET etcetera). Note: FTP security cannot be enabled if an SSL socket has been activated by means of #SSLD or #SSLFASTD. Moreover, trying to dial an SSL socket when **<enable>**=1 raises an error. Note: any **<enable>** change is forbidden during an open FTP connection (with or without security). Furthermore, SSL configuration settings are forbidden during FTPS connections
AT#FTPCFG?	Read command reports the currently selected parameters in the format: **#FTPCFG: <tout>,<IPPignoring>,<FTPSEn>**
AT+FTPCFG=?	Test command reports the supported range of values for parameter(s) **<tout>,<IPPignoring> and <FTPSEn>**

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5.1.6.7.5. FTP Put - #FTPPUT

#FTPPUT - FTP Put	SELINT 2
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. afterward a NO CARRIER indication is sent when the socket is closed. Note: if we set **<connMode>** to 1, the data connection is openedand we remain in command mode and we see the result code **OK** (instead of **CONNECT**) Parameters: **<filename>** - string type, name of the file (maximum length 200 characters) **<connMode>** 0 - online mode 1 – command mode Note: use the escape sequence +++ to close the data connection. Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
AT#FTPPUT=?	Test command reports the maximum length of **<filename>** and the supported range of values of **<connMode>**. The format is: **#FTPPUT: <length>, (list of supported <connMode>s)** where: **<length>** - integer type value indicating the maximum length of **<filename>**

5.1.6.7.6. FTP Get - #FTPGET

#FTPGET - FTP Get	SELINT 2
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. 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.

5.1.6.7.7. FTP GET in command mode - #FTPGETPKT

#FTPGETPKT - FTP Get in command mode	SELINT 2
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 Parameters: **<filename>** - file name, string type. (maximum length: 200 characters). **<viewMode>** - permit to choose view mode (text format or Hexadecimal) 0 – text format (default) 1 – hexadecimal format Note: The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet. Note: Command closure should always be handled by application. In order to avoid download stall situations a timeout should be implemented by the application.
AT#FTPGETPKT?	Read command reports current download state for <filename> with

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#FTPGETPKT - FTP Get in command mode	SELINT 2
	<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.

5.1.6.7.8. FTP Type - #FTPTYPE

#FTPTYPE - FTP Type	SELINT 2
AT#FTPTYPE=[<type>]	Set command, issued during an FTP connection, sets the file transfer type. Parameter: **<type>** - file transfer type: 0 - binary 1 - ascii Note: The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
#FTPTYPE?	Read command returns the current file transfer type, in the format: **#FTPTYPE: <type>**
#FTPTYPE=?	Test command returns the range of available values for parameter **<type>**: **#FTPTYPE: (0,1)**

5.1.6.7.9. FTP Read Message - #FTPMSG

#FTPMSG - FTP Read Message	SELINT 2
AT#FTPMSG	Execution command returns the last response from the server.
AT#FTPMSG=?	Test command returns the **OK** result code.

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5.1.6.7.10. FTP Delete - #FTPDELE

#FTPDELE - FTP Delete	SELINT 2
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. Note: In case of delayed server response, it is necessary to check if ERROR indication is temporary due to timing out while waiting. In this case #FTPMSG response will result temporary empty. (Checking later #FTPMSG response will match with delayed server response)
AT#FTPDELE=?	Test command returns the **OK** result code.

5.1.6.7.11. FTP Print Working Directory - #FTPPWD

#FTPPWD - FTP Print Working Directory	SELINT 2
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.

5.1.6.7.12. FTP Change Working Directory - #FTPCWD

#FTPCWD - FTP Change Working Directory	SELINT 2
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.

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5.1.6.7.13. FTP List - #FTPLIST

#FTPLIST - FTP List	SELINT 2
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.

5.1.6.7.14. Get file size - #FTPFSIZE

#FTPFSIZE – Get file size from FTP server	SELINT 2
AT#FTPFSIZE=<filename>	Execution command, issued during an FTP connection, permits to get file size of <filename> file. Note: FTPTYPE=0 command has to be issued before FTPFSIZE command, to set file transfer type to binary mode.
AT# FTPFSIZE=?	Test command returns the OK result code.

5.1.6.7.15. FTP Append - #FTPAPP

#FTPAPP - FTP Append	SELINT 2
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 succeeds, 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 openedand we remain in command mode and we see the result code **OK** (instead of **CONNECT**) Parameter: **<filename>** - string type, name of the file.

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#FTPAPP - FTP Append	SELINT 2
	<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>**

5.1.6.7.16. Set restart position - # FTPREST

#FTPREST – Set restart position for FTP GET	SELINT 2
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. Parameter: <restartposition> position in byte of restarting for successive FTPGET (or FTPGETPKT) Note: It's necessary to issue FTPTYPE=0 before successive FTPGET (or FTPGETPKT command) 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.

#FTPREST – Set restart position for FTP GET	SELINT 2
AT#FTPREST?	Read command returns the current <restartposition> #FTPREST: <restartposition>
AT#FTPREST=?	Test command returns the OK result code.

5.1.6.7.17. Receive Data In Command Mode - #FTPRECV

#FTPRECV – Receive Data In Command Mode	SELINT 2
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. Parameters: **< blocksize >** - max number of bytes to read 1..3000 Note: it's necessary to have previously opened FTP data port and started download and buffering of remote file through #FTPGETPKT command Note: issuing **#FTPRECV** when there's no FTP data port opened raises an error. Note: data port will stay opened if socket is temporary waiting to receive data(FTPRECV returns 0 and FTPGETPKT gives a EOF 0 indication).
AT#FTPRECV?	Read command reports the number of bytes currently received from FTP server, in the format: #FTPRECV: <available>
AT#FTPRECV=?	Test command returns the range of supported values for <blocksize> parameter.

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#FTPRECV – Receive Data In Command Mode	SELINT 2
Example	AT#FTPRECV? #FTPRECV: 3000 OK Read required part of the buffered data: AT#FTPRECV=400 #FTPRECV: 400 Text row number 1 * 111111111111111111111111 * Text row number 2 * 222222222222222222222222 * Text row number 3 * 333333333333333333333333 * Text row number 4 * 444444444444444444444444 * Text row number 5 * 555555555555555555555555 * Text row number 6 * 666666666666666666666666 * Text row number 7 * 777777777777777777777777 * Text row number 8 * 88888888888888888 OK AT#FTPRECV =200 #FTPRECV: 200 88888 * Text row number 9 * 999999999999999999999999 * Text row number 10 * AAAAAAAAAAAAAAAAAAAAAAAA * Text row number 12 * BBBBBBBBBBBBBBBBBBBBBBBB * Text row number 13 * CCCCCCCCCCCCCCC OK Note: to check when you have received complete file it's possible to use AT#FTPGETPKT read command: AT#FTPGETPKT? #FTPGETPKT: sample.txt,0,1 OK (you will get <eof> set to 1)

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5.1.6.7.17.1. FTP Append

#FTPAPP - FTP Append	**SELINT 2**
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 succeeds, 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 openedand we remain in command mode and we see the result code **OK** (instead of **CONNECT**) Parameter: **<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 supported range of values for parameters **<filename>** and **<connMode>**

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5.1.6.7.17.2. FTPAPPEXT - #FTPAPPEXT

#FTPAPPEXT –	**SELINT 2**
AT#FTPAPPEXT=<bytestosend>[,<eof>]	This command permits to send data on a FTP data port while the module is in command mode. FTP data port has to be previously opened through **#FTPPUT** (or **#FTPAPP**) with **<connMode>** parameter set to command mode connection. Parameters: **<bytestosend>** - number of bytes to be sent 1..1500 **<eof>** - data port closure 0 – normal sending of data chunk 1 – close data port after sending data chunk The device responds to the command with the prompt <greater_than><space> and waits for the data to send. When **<bytestosend>** bytes have been sent, operation is automatically completed. If (all or part of the) data are successfully sent, then the response is: **#FTPAPPEXT: <sentbytes>** **OK** Where **<sentbytes>** are the number of sent bytes. Note: **<sentbytes>** could be less than **<bytestosend>** If data sending fails for some reason, an error code is reported.
AT#FTPAPPEXT=?	Test command reports the supported range of values for parameters **<bytestosend>** and **<eof>**
Example	*AT#FTPOPEN="IP",username,password* *OK* *AT#FTPPUT=<filename>,1 -> the new param 1 means that we open the connection in* *command mode* *OK*

	// Here data socket will stay opened, but interface will be *//available(command mode)* *AT#FTPAPPEXT=Size* *>... write here the binary data. As soon Size byte are written, data are sent and OK is returned* *#FTPAPPEXT: <SentBytes>* *OK* *……* *// Last #FTPAPPEXT will close the data socket, because* *// second(optional) parameter has this meaning:* *AT#FTPAPPEXT=Size,1* *>...write here the binary data. As soon Size byte are written, data are sent and OK is returned* *#FTPAPPEXT: <SentBytes>* *OK* *// If the user has to reopen the data port to send another* *// (or append to the same) file, he can restart with the* *// FTPPUT(or FTPAPP.)* *//Then FTPAPPEXT,... to send the data chunks on the //reopened data port.* *// Note: if while sending the chunks the data port is closed* *// from remote, user will be aware of it because #FTPAPPEXT // will indicate 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)*

5.1.6.8. Enhanced IP Easy Extension AT Commands

5.1.6.8.1. Authentication User ID - #USERID

#USERID - Authentication User ID	**SELINT 2**
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 ""). Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
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

5.1.6.8.2. Authentication Password - #PASSW

#PASSW - Authentication Password	**SELINT 2**
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 ""). Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
AT#PASSW=?	Test command returns the maximum allowed length of the string parameter **<pwd>**.
Example	AT#PASSW="myPassword" OK

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5.1.6.8.3. Packet Size - #PKTSZ

#PKTSZ - Packet Size	SELINT 2
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) Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
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 *->value automatically chosen by device* OK

5.1.6.8.4. Data Sending Time-Out - #DSTO

#DSTO -Data Sending Time-Out	SELINT 2
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

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#DSTO -Data Sending Time-Out	SELINT 2
	had been received and full packet size reached. Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
AT#DSTO?	Read command reports the current data sending time-out value.
AT#DSTO=?	Test command returns the allowed values for the parameter **<tout>**.
Example	AT#DSTO=10 ->1 sec. time-out OK AT#DSTO? #DSTO: 10 OK

5.1.6.8.5. Socket Inactivity Time-Out - #SKTTO

#SKTTO - Socket Inactivity Time-Out	SELINT 2
AT#SKTTO= [<tout>]	Set command sets the maximum time with no data exchanging on the socket that the module awaits before closing the socket 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. Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
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 ->(30 sec. time-out) OK AT#SKTTO? #SKTTO: 30 OK

5.1.6.8.6. Socket Definition - #SKTSET

#SKTSET - Socket Definition	SELINT 2
AT#SKTSET= [<socket type>, <remote port>, <remote addr>, [<closure type>],	Set command sets the socket parameters values. Parameters: **<socket type>** - socket protocol type 0 - TCP (factory default)

#SKTSET - Socket Definition	**SELINT 2**
[<local port>]]	1 - UDP **<remote port>** - remote host port to be opened 0..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 when remote host has closed 0 - local host closes immediately (default) 255 - local host closes after an escape sequence (+++) or immediately in case of an abortive disconnect from remote. **<local port>** - local host port to be used on UDP socket 0..65535 - port number 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. Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
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,"123.255.020.001" OK AT#SKTSET=0,1024,"www.telit.net" OK
Note	Issuing command **#QDNS** will overwrite **<remote addr>** setting.

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5.1.6.8.7. Query DNS - #QDNS

#QDNS - Query DNS	SELINT 2
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, as follows: **#QDNS: <host name>,<IP address>** where **<host name>** - string type **<IP address>** - string type, in the format **"xxx.xxx.xxx.xxx"** 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. It also works with GSM context, but the GSM context has to be activated before.
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 (or GSM, if GSM context is used).
Note	Issuing command **#QDNS** will overwrite **<remote addr>** setting for command **#SKTSET**.
Note	This command is available only on the first AT instance (see AT#PORTCFG) or on the first virtual port of CMUX and works on the PDP context 1 and on the first ConnId (see AT#SCFG)

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5.1.6.8.8. DNS Response Caching - #CACHEDNS

#CACHEDNS – DNS Response Caching	SELINT 2
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: If the cache is full (8 elements) and a new IP address is resolved, an element is deleted from the cache: the one that has not been used for the longest time. 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"**

5.1.6.8.9. Manual DNS Selection - #DNS

#DNS – Manual DNS Selection	SELINT 2
AT#DNS=<cid>, <primary>, <secondary>	Set command allows to manually set primary and secondary DNS servers either for a PDP context defined by **+CGDCONT** or for a GSM context defined by **#GSMCONT** Parameters: **<cid>** - context identifier 0 - specifies the GSM context 1..5 - numeric parameter which specifies a particular PDP context definition **<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"** and **<secondary> is not "0.0.0.0"**, then issuing **AT#DNS=…** raises an error. Note: if **<primary> is "0.0.0.0"** we're using the **primary DNS server** come from the network as consequence of a context activation. Note: if **<primary> is not "0.0.0.0"** and **<secondary> is "0.0.0.0"**, then we're using only the **manual primary DNS server.** Note: the context identified by **<cid>** has to be previously defined, elsewhere issuing **AT#DNS=…** raises an error. Note: the context identified by **<cid>** has to be not activated yet, elsewhere issuing **AT#DNS=…** raises an error.
AT#DNS?	Read command returns the manual DNS servers set either for every defined PDP context 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: (0-5),,**

5.1.6.8.10. Socket TCP Connection Time-Out - #SKTCT

#SKTCT - Socket TCP Connection Time-Out	**SELINT 2**
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. Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
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.*

5.1.6.8.11. Socket Parameters Save - #SKTSAV

#SKTSAV - Socket Parameters Save	**SELINT 2**
AT#SKTSAV	Execution command stores the current 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 Note: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
AT#SKTSAV=?	Test command returns the **OK** result code.
Example	AT#SKTSAV OK

#SKTSAV - Socket Parameters Save	SELINT 2
	socket parameters have been saved in NVM
Note	If some parameters have not been previously specified then a default value will be stored.

5.1.6.8.12. Socket Parameters Reset - #SKTRST

#SKTRST - Socket Parameters Reset	SELINT 2
AT#SKTRST	Execution command resets the socket parameters to the "factory default" configuration and stores them in the NVM of the device. 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*

5.1.6.8.13. GPRS Context Activation - #GPRS

#GPRS - GPRS Context Activation	SELINT 2
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.

#GPRS - GPRS Context Activation	**SELINT 2**
	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 **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** Note: this command is not allowed if GSM context has been activated (see **AT#SGACT=0,1**).
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.*
Note	It is strongly recommended to use the same command (e.g. **#GPRS**) to activate the context, deactivate it and interrogate about its status.

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5.1.6.8.14. Socket Dial - #SKTD

#SKTD - Socket Dial	SELINT 2
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 **<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 when remote host has closed 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) or immediately in case of an abortive disconnect from remote.**<local port>** - local host port to be used on UDP socket 1..65535 - port number 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: this command is not allowed for sockets associated to a GSM context (see **#SCFG**).
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.

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#SKTD - Socket Dial	SELINT 2
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

5.1.6.8.15. Socket Listen - #SKTL

#SKTL - Socket Listen	SELINT 2
AT#SKTL =[<mode>, <socket type>, <input port>, [<closure type>]]	Execution command opens/closes the socket listening for connection requests. Parameters: **<mode>** - socket mode 0 - closes socket listening 1 - starts socket listening **<socket type>** - socket protocol type 0 -TCP (default) 1- UDP **<input port>** - local host input port to be listened **1**..65535 - port number **<closure type>** - socket closure behaviour for TCP when remote host has closed 0 - local host closes immediately when remote host has closed (default) 255 - local host closes after an escape sequence (+++) or immediately in case of an abortive disconnect from remote. 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

#SKTL - Socket Listen	**SELINT 2**
	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 **<input port>** and **<closure type>**, in the format: **#SKTL: <status>,<socket type>, <input port>,<closure type>** Where **<status>** - socket listening status 0 - socket not listening 1 - socket listening
AT#SKTL=?	Test command returns the allowed values for parameters **<mode>**, **<socket type>**, **<input port>** and **<closure type>**.
Example	*Activate GPRS* AT#GPRS=1 +IP: ###.###.###.### OK *Start TCP listening* AT#SKTL=1,0,1024 OK or AT#SKTL=1,0,1024,255 OK *Receive TCP 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

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#SKTL - Socket Listen	SELINT 2
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.

5.1.6.8.16. Socket Listen Ring Indicator - #E2SLRI

#E2SLRI - Socket Listen Ring Indicator	SELINT 2
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>.**

5.1.6.8.17. Firewall Setup - #FRWL

#FRWL - Firewall Setup	SELINT 2
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.

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#FRWL - Firewall Setup	SELINT 2
	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. Rules are not saved in NVM, at startup the rules list will be empty. It will return ERROR if executed using SMSATRUN digest mode or TCPATRUN server mode

5.1.6.8.18. Firewall Setup for IPV6 addresses - #FRWLIPV6

#FRWLIPV6 - Firewall Setup for IPV6 addresses	SELINT 2
AT#FRWLIPV6= [<action>, <ip_address>, <net mask>]	Execution command controls the internal firewall settings for IPV6 addresses. Parameters: <action> - command action 0 - remove selected chain 1 - add an ACCEPT chain 2 - remove all chains (DROP everything); <ip_addr> and <net_mask> has no meaning in this case. <ip_addr> - remote address to be added into the ACCEPT chain; string type, it

#FRWLIPV6 - Firewall Setup for IPV6 addresses		SELINT 2
	can be any valid IP address in the format xxx.xxx.xxx.xxx. xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx or in the format yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy <net_mask> - mask to be applied on the <ip_addr>; string type, it can be any valid IP address mask in the format xxx.xxx.xxx.xxx. xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx or in the format yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy:yyyy Command returns OK result code if successful. Note: the firewall applies for incoming (listening) connections only. Firewall general policy is DROP, therefore all packets that are not included into an ACCEPT chain rule will be silently discarded. When a packet comes from the IP address incoming_IP, the firewall chain rules will be scanned for matching with the following criteria: incoming_IP & <net_mask> = <ip_addr> & <net_mask> If criteria is matched, then the packet is accepted and the rule scan is finished; if criteria is not matched for any chain the packet is silently dropped.	
AT#FRWLIPV6?	Read command reports the list of all **ACCEPT** chain rules registered in the Firewall settings in the format: **#FRWLIPV6: <ip_addr>,<net_mask>** **#FRWLIPV6: <ip_addr>,<net_mask>** **….** **OK**	
AT#FRWLIPV6=?	Test command returns the allowed values for parameter **<action>**.	

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5.1.6.8.19. GPRS Data Volume - #GDATAVOL

#GDATAVOL - GPRS Data Volume	SELINT 2
AT#GDATAVOL=[<mode>]	Execution command reports, for every active PDP context, the amount of data the last GPRS session (and the last GSM session, if GSM context is active) received and transmitted, or it will report the total amount of data received and transmitted during all past GPRS (and GSM) sessions, since last reset. Parameter: **<mode>** 0 - it resets the GPRS data counter for the all the available PDP contexts (1-5) and GSM data counter for GSM context 0 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**) (and the last GSM session data counter for the GSM context, if set through **#GSMCONT**), 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 0 - specifies the GSM context 1..5 - numeric parameter which specifies a particular PDP context definition **<tot*n*>** - number of bytes either received or transmitted in the last GPRS (or GSM) session for **<cid*n*>** PDP context; **<sent*n*>** - number of bytes transmitted in the last GPRS (or GSM) session for **<cid*n*>** PDP context; **<received*n*>** - number of bytes received in the last GPRS (or GSM) 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**) and the total GSM data counter for the GSM context, if set through **#GSMCONT**, 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 0 - specifies the GSM context 1..5 - numeric parameter which specifies a particular PDP context definition **<tot*n*>** - number of bytes either received or transmitted, in every GPRS (or GSM) session since last reset, for **<cid*n*>** PDP context; **<sent*n*>** - number of bytes transmitted, in every GPRS (or GSM) session since last reset, for **<cid*n*>** PDP context; **<received*n*>** - number of bytes received, in every GPRS (or GSM) session

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#GDATAVOL - GPRS Data Volume	SELINT 2
	since last reset, for <**cid*n***> PDP context; Note: last GPRS and GSM session counters are not saved in NVM so they are loosen at power off. Note: total GPRS and GSM session counters are saved on NVM.
AT#GDATAVOL=?	Test command returns the range of supported values for parameter **<mode>.**

5.1.6.8.20. ICMP Ping Support - #ICMP

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

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5.1.6.8.21. PING request - #PING

#PING – Send PING request	
AT#PING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>]]]]	This command is used to send Ping Echo Request messages and to receive the corresponding Echo Reply. Parameters: **<IPaddr>** - address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query **<retryNum>** - the number of Ping Echo Request to send 1-64 (default 4) **<len>** - the lenght of Ping Echo Request message 32-1460 (default 32) **<timeout>** - the timeout, in 100 ms units, waiting a single Echo Reply 1-600 (default 50) **<ttl>** - time to live 1-255 (default 128) Once the single Echo Reply message is receive a string like that is displayed: **#PING: <replyId>,<Ip Address>,<replyTime>,<ttl>** Where: **<replyId>** - Echo Reply number **<Ip Address>** - IP address of the remote host **<replyTime>** - time, in 100 ms units, required to receive the response **<ttl>** - time to live of the Echo Reply message 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

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5.1.6.8.22. DNS from Network - #NWDNS

#NWDNS – DNS from Network	SELINT 2
AT#NWDNS=[<cid>[,<cid>[,…]]]	Execution command returns either the primary and secondary DNS addresses for the GSM context (if specified) and/or a list of primary and secondary DNS addresses for the specified PDP context identifiers Parameters: **<cid>** - context identifier 0 - specifies the GSM context (see **+GSMCONT**). 1..5 - numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). Note: if no **<cid>** is specified, the DNS addresses for all **defined** contexts are returned. Note: issuing the command with more than 6 parameters raises an error. Note: the command returns only one row of information for every specified **<cid>**, even if the same **<cid>** is present more than once. The command returns a row of information for every specified **<cid>** whose context has been already defined. No row is returned for a **<cid>** whose context has not been defined yet. Response format is: **#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress>[<CR><LF>** **#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress> […]]** where: **<cid>** - context identifier, as before **<PDNSaddress>,<SDNSaddress>** - primary and secondary DNS addresses set through AT#DNS command. If not set, they are the primary and secondary DNS addresses assigned during the PDP(or GSM) context activation.
AT#NWDNS=?	Test command returns a list of defined **<cid>**s.

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5.1.6.9. SMS AT Commands

5.1.6.9.1. Move Short Message to other memory - #SMSMOVE

#SMSMOVE – Move Short Message to other memory	**SELINT 2**
AT#SMSMOVE=<index>	Execution command moves selected Short Message from current memory to destination memory. Parameter: **<index>** - message index in the memory selected by **+CPMS** command. It can have values form 1 to N, where N depends on the available space (see **+CPMS**) Note: if the destination memory is full, an error is returned.
AT#SMSMOVE?	Read command reports the message storage status of the current memory and the destination memory in the format: **#SMSMOVE:** **<curr_mem>,<used_curr_mem>,<total_curr_mem>,<dest_mem>,<used_dest_mem>,<total_dest_mem>** Where: - **<curr_mem>** is the current memory, selected by **+CPMS** command. It can assume the values **"SM"** or **"ME"** - **<used_curr_mem>** is the number of SMs stored in the current memory - **<total_curr_mem>** is the max number of SMs that the current memory can contain - **<dest_mem>** is the destination memory. It can assume the values **"SM"** or **"ME"** - **<used_dest_mem>** is the number of SMs stored in the destination memory - **<total_dest_mem>** is the max number of SMs that the destination memory can contain
AT#SMSMOVE=?	Test command reports the supported values for parameter **<index>**
Example	*AT#SMSMOVE?* *#SMSMOVE: "ME",3,100,"SM",0,50* *OK* *//the current memory is ME where 3 SMs are stored; the destination memory is SIM that is empty* *AT+CMGL=ALL* *+CMGL: 1,"STO UNSENT","32XXXXXXXX","",* *test 1* *+CMGL: 2,"STO UNSENT","32XXXXXXXX","",* *test 2* *+CMGL: 3,"STO UNSENT","32XXXXXXXX","",*

#SMSMOVE – Move Short Message to other memory	SELINT 2
	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*

5.1.6.9.2. SMS Commnads Operation Mode - #SMSMODE

#SMSMODE - SMS Commands Operation Mode	SELINT 2
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**>

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5.1.6.10. E-mail Management AT Commands

5.1.6.10.1. E-mail SMTP Server - #ESMTP

#ESMTP - E-mail SMTP Server	**SELINT 2**
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.

5.1.6.10.2. E-mail Sender Address - #EADDR

#EADDR - E-mail Sender Address	**SELINT 2**
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

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5.1.6.10.3. E-mail Authentication User Name - #EUSER

#EUSER - E-mail Authentication User Name	SELINT 2
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**).

5.1.6.10.4. E-mail Authentication Password - #EPASSW

#EPASSW - E-mail Authentication Password	SELINT 2
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**).

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5.1.6.10.5. E-mail Sending - #EMAILD

#EMAILD - E-mail Sending	**SELINT 2**
AT#EMAILD=[<da>, <subj>]	Execution command sends an e-mail message if GPRS context has already been activated by either **AT#SGACT=1,1** or **AT#GPRS=1**. It is also possible to send an e-mail on the GSM context, if it has already been activated by **AT#SGACT=0,1**. 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: if the length of one of the string type parameters exceeds the maximum length, then the string is truncated. Note: Care must be taken to ensure that during the command execution, no other commands are issued. To avoid malfunctions is suggested to wait for the **OK** or **ERROR / +CMS ERROR:<err>** response before issuing further commands. Note: maximum length for message body is 1500 trying to send more data will cause the surplus to be discarded and lost.
AT#EMAILD=?	Test command returns the **OK** result code.
Example	AT#EMAILD=”me@myaddress.com”,”subject of the mail” >message body… this is the text of the mail message… CTRL-Z *..wait..* OK *Message has been sent.*

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5.1.6.10.6. E-mail Parameters Save - #ESAV

#ESAV - E-mail Parameters Save	SELINT 2
AT#ESAV	Execution command stores the e-mail parameters in the NVM of the device. The e-mail parameters to store 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.

5.1.6.10.7. E-mail Parameters Reset - #ERST

#ERST - E-mail Parameters Reset	SELINT 2
AT#ERST	Execution command resets the e-mail parameters to the "factory default" configuration and stores them in the NVM of the device. The e-mail parameters to 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.

5.1.6.10.8. SMTP Read Message - #EMAILMSG

#EMAILMSG - SMTP Read Message	SELINT 2
AT#EMAILMSG	Execution command returns the last response from SMTP server.
AT#EMAILMSG=?	Test command returns the **OK** result code.

5.1.6.10.9. Send mail with attachment - #SMTPCL

#SMTPCL – send mail with attachment	SELINT 2
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 or #GPRS). 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.

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	Encoding of data received on the serial port is performed if required (binary data), before transmission on the SMTP socket. Parameters: **<da>** - destination address, string type. (maximum length 100 characters) **<subj>** - subject of the message, string type. (maximum length 100 characters) **<att>** - attached file flag 0 – no attachment 1 – attach a txt file 2 – attach a binary file(jpg,bin,pdf,...) **<filename>** - attached file name (maximum length 50 characters) **<encod>** -Content-Transfer-Encoding used for attachment 0 – "7bit" means data all represented as short lines of US-ASCII data 1 – "base64" designed to represent arbitrary sequences of octets in a form that need not be humanly readable Note: if no attachment (**<att>** 0) has to be sent, the behavior is the same as with #EMAILD. OK after CTRL-Z is returned(if connection was successful), the switch to online mode is not performed. Note: If a txt file (**<att>**=1) is attached, only **<encod>**0("7bit") is possible. If a binary file (**<att>**=2) is attached, only **<encod>**1("base64") is possible. Note: if **<att>**=0 and **<filename>** is present and not empty, the attachment won't be considered Note: if **<att>** 1 or 2 and **<filename>** is not present, command will return an ERROR Note: default SMTP port (25) is used
AT#SMTPCL=?	Test command reports the supported range of values for parameters **<da>,<subj>,<att>[,<filename>,<encod>]**
Examples	at#smtpcl="me@myaddress.com","test1",1,"sample.txt",0 >message body...this is the text of the mail message… *Send CTRL-Z* CONNECT

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

5.1.6.10.10. E-mail SMTP Port - #ESMTPPORT

#ESMTPPORT – E-mail SMTP Port	**SELINT 2**
AT#ESMTPPORT=<Port>	This command permits to set SMTP port Parameters: **<Port>** - SMTP port to contact (default 25) 25..465,587 Note: SMTP protocol is used on the selected port Note: the value set by command is directly stored in NVM
AT#ESMTPPORT?	Read command reports the currently selected **<Port>** in the format: **#ESMTPPORT: <Port >**
AT#ESMTPPORT=?	Test command reports the supported range of values for parameter **< Port >**

5.1.6.10.11. Configure SMTP parameters - #SMTPCFG

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#SMTPCFG – configure SMTP parameters	**SELINT 2**
AT#SMTPCFG=<ssl_enabled>[,<port>[,<mode>[,<UNUSED_1>[,<pkt_size>[,<UNUSED_2>]]]]]	This command sets the parameters needed to the SMTP connection Parameters: **<ssl_enabled> -** Numeric parameter indicating if the SSL encryption is enabled. 0 – SSL encryption disabled (default) 1 – SSL encryption enabled **<port>**: SMTP port to contact (default 25) 25..465,587 **<mode>** - SMTP start session command 0 – SMTP start session command HELO (default) 1 – SMTP start session command EHLO **<pkt_size>** - send size for attachment sending (see **#SMTPCL** command) 0 – select automatically default value(1024). 1..1500 – send size in bytes. Note: the SSL encryption can be enabled only if <Enable> parameter of #SSLEN is set to 0, <FTPSEn> parameter of #FTPCFG is set to 0 and <ssl_enabled> parameter of #HTTPCFG is set to 0. Note: values are automatically saved in NVM.
AT#SMTPCFG?	Read command returns the current settings in the format: **#SMTPCFG:<ssl_enabled>,<port>,<mode>,0,<pkt_size>,0** **<CR><LF>**
AT#SMTPCFG=?	Test command returns the supported range of parameters **<ssl_enabled>, <port>, <mode>** and **<pkt_size>** in the format: **#SMTPCFG: (list of supported <ssl_enabled>s),(list of supported <port>s),(list of supported <mode>s),(0),(list of supported <pkt_size>s) ,(0)**

5.1.6.11. HTTP Client AT Commands

5.1.6.11.1. Configure HTTP Parameters - #HTTPCFG

#HTTPCFG – configure HTTP parameters	**SELINT 2**
AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout> [,<cid>[,<pkt_size>][,<UNUSED_1>[,<UNUSED_2>]]]]]]]]]	This command sets the parameters needed to the HTTP connection Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<server_address>** - String parameter indicating the IP address of the HTTP server. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query Default: "" for first and second profile; "m2mlocate.telit.com" for third profile. **<server_port>** - Numeric parameter indicating the TCP remote port of the HTTP server to connect to. Default: 80 for first and second profile; 9978 for third profile. Range 1...65535. **<auth_type>** - Numeric parameter indicating the HTTP authentication type. 0 – no authentication (default) 1 – basic authentication **<username>** - String parameter indicating authentication user identification string for HTTP. **<password>** - String parameter indicating authentication password for HTTP. **<ssl_enabled>** - Numeric parameter indicating if the SSL encryption is enabled. 0 – SSL encryption disabled (default) 1 – SSL encryption enabled **<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

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	<pkt_size> - send(**#HTTPSND**) or recv(**#HTTPRCV**) size for data sending or receiving. 0 – select automatically default value(300). 1..1500 – send or recv size in bytes. Note: an ERROR is issued if <UNUSED_1> and <UNUSED_2> parameters are set with a value different from 0. Note: a special form of the Set command, **#HTTPCFG=<prof_id>**, causes the values for profile number **<prof_id>** to reset to default values. 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: the SSL encryption can be enabled only if <Enable> parameter of #SSLEN is set to 0 and <FTPSEn> parameter of #FTPCFG is set to 0. Note: if it's needed to configure security parameters, it is possible to use **#SSLSECCFG/#SSLSECDATA** commands as usual for **#SSLD** Note: values are automatically saved in NVM.
AT#HTTPCFG?	Read command returns the current settings for each defined profile in the format: **#HTTPCFG:** **<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,<pkt_size>,0,0 <CR><LF>[<CR><LF>#HTTPCFG:** **<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,<pkt_size>,0,0]<CR><LF>[…]]**
AT#HTTPCFG=?	Test command returns the supported range of parameters **<prof_id>**, **<server_port>**, **<auth_type>**, **<ssl_enabled>**, **<timeout>**,**<cid>** and **<pkt_size>** and the maximum length of **<server_address>**, **<username>** and **<password>** parameters in the format: **# HTTPCFG: (list of supported <prof_id>s),<s_length>,(list of supported <server_port>s), (list of supported <auth_type>s),<u_length>,<p_length>,(list of supported <ssl_enabled>s),(list of supported <timeout>s),(list of supported <cid>s),(list of supported <pkt_size>s)** where:

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	<s_length> - integer type value indicating the maximum length of parameter **<server_address>**. **<u_length>** - integer type value indicating the maximum length of parameter **<username>**. **<p_length>** - integer type value indicating the maximum length of parameter **<password>**

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

#HTTPQRY – send HTTP GET, HEAD or DELETE request	SELINT 2
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**

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	command, then the URC **#HTTPRING <http_status_code>** parameter has value 0.
AT#HTTPQRY=?	Test command reports the supported range of values for the parameters **<prof_id>** and **<command>** and the maximum length of **<resource>** parameter in the format: **#HTTPQRY: (list of supported <prof_id>s),(list of supported <command>s),<r_length>,<m_length>** where: **<r_length>** - integer type value indicating the maximum length of parameter **<resource>**. **<m_length>** - integer type value indicating the maximum length of parameter **<extra_header_line>**.

5.1.6.11.3. Send HTTP POST or PUT request - #HTTPSND

#HTTPSND – send HTTP POST or PUT request	**SELINT 2**
AT#HTTPSND=<prof_id>,<command>,<resource>,<data_len>[,<post_param>[,<extra_header_line>]]	Execution command performs a POST or PUT request to HTTP server and starts sending data to the server. The device shall prompt a three character sequence **<greater_than><greater_than><greater_than>** **(IRA 62, 62, 62)** after command line is terminated with <CR>; after that the data can be entered from TE, sized **<data_len>** bytes. Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<command>**: Numeric parameter indicating the command requested to HTTP server: 0 – POST 1 – PUT **<resource>**: String parameter indicating the HTTP resource (uri), object of the request **<data_len>**: Numeric parameter indicating the data length to input in bytes **<post_param>**: Numeric/string parameter indicating the HTTP Content-type identifier, used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier:

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	"0[:extension]" – "application/x-www-form-urlencoded" with optional extension "1[:extension]" – "text/plain" with optional extension "2[:extension]" – "application/octet-stream" with optional extension "3[:extension]" – "multipart/form-data" with optional extension other content – free string corresponding to other content type and possible sub-types **<extra_header_line>**: String parameter indicating optional HTTP header line If sending ends successfully, the response is OK; otherwise an error code is reported. Note: the HTTP request header sent with #HTTPSND always contains the "Connection: close" line, and it can not be removed. When the HTTP server answer is received, then the following URC is put on the serial port: **#HTTPRING:** **<prof_id>,<http_status_code>,<content_type>,<data_size>** Where: **<prof_id>** is defined as above **<http_status_code>** is the numeric status code, as received from the server (see RFC 2616) **<content_type>** is a string reporting the "Content-Type" header line, as received from the server (see RFC 2616) **<data_size>** is the byte amount of data received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0. Note: if there are no data from server or the server doesn't answer within the time interval specified in **<timeout>** parameter of **#HTTPCFG** command, then the URC **#HTTPRING <http_status_code>** parameter has value 0.
AT#HTTPSND=?	Test command returns the supported range of parameters **<prof_id>**, **<command>** and **<data_len>** and the maximum length of **<resource>**, **<post_param>** and **<extra_header_line>** parameters in the format: **# HTTPSND: (list of supported <prof_id>s),(list of supported <command>s), <r_length>, (list of supported <data_len>s),<p_length>,<m_length>** where: **<r_length>** - integer type value indicating the maximum length of

	parameter <**resource**>. <**p_length**> - integer type value indicating the maximum length of parameter <**post_param**>. <**m_length**> - integer type value indicating the maximum length of parameter <**extra_header_line**>
Example	*Post 100 byte without "Content-type" header* **AT#HTTPSND=0,0,"/",100** >>> *Post 100 byte with "application/x-www-form-urlencoded"* **AT#HTTPSND=0,0,"/",100,0** >>> *Post 100 byte with "multipart/form-data" and extension* **AT#HTTPSND=0,0,"/",100,"3:boundary=----FormBoundary"** >>>

5.1.6.11.4. receive HTTP server data - #HTTPRCV

#HTTPRCV – receive HTTP server data	SELINT 2
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

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	<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> parameter in the format: # HTTPRCV: (list of supported <prof_id>s)

5.1.6.12. Easy Script® Extension - Python 9 Interpreter, AT Commands

5.1.6.12.1. Write Script - #WSCRIPT

#WSCRIPT - Write Script	**SELINT 2**
AT#WSCRIPT=[<script_name>,<size>,[,<hidden>]]	Execution command causes the MODULE to store a file in the Easy Script® related NVM, naming it **<script_name>** The file should be sent using RAW ASCII file transfer. It is important to set properly the port settings. In particular: **Flow control: hardware.** **Baud rate: 115200 bps** Parameters: **<script_name>** - name of the file in NVM, string type (max 16 chars, case sensitive). **<size>** - file size in bytes **<hidden>** - file hidden attribute 0 - file content is readable with **#RSCRIPT** (default). 1 - file content is readable with **#RSCRIPT** (no effect). The device shall prompt a five character sequence **<CR><LF><greater_than><greater_than><greater_than>** **(IRA 13, 10, 62, 62, 62)** after command line is terminated with **<CR>**; after that a file can be entered from TE, sized **<size>** bytes. The operations completes when all the bytes are received. If writing ends successfully, the response is **OK**; otherwise an error code is reported. Note: the file name should be passed between quotes; every textual script file must have **.py** extension, whilst every pre-compiled executable script file must have **.pyo**

[9] PYTHON is a registered trademark of the Python Software Foundation.

#WSCRIPT - Write Script	SELINT 2
	extension; file names are case sensitive. Note: when sending the script be sure that the line terminator is **<CR><LF>** and that your terminal program does not change it.
AT#WSCRIPT=?	Test command returns **OK** result code.
Example	AT#WSCRIPT="First.py",54,0 *>>> here receive the prompt; then type or send the textual script, sized 54 bytes* OK *Textual script has been stored*
Note	It's recommended to use the extension **.py** only for textual script files and the extension **.pyo** only for pre-compiled executable script files.

5.1.6.12.2. Select Active Script - #ESCRIPT

#ESCRIPT - Select Active Script	SELINT 2
AT#ESCRIPT=[<script_name>]	Set command selects either a) the name of the textual script file that will be compiled and executed by the Easy Script® compiler at startup according to last **#STARTMODESCR** setting, or b) the name of the pre-compiled executable file that will be executed at startup according to last **#STARTMODESCR** setting. We call this file (either textual or pre-compiled) the **current script**. Parameter: **<script_name>** - file name, string type (max 16 chars, case sensitive). Note: all textual script files must have **.py** extension; all pre-compiled executable files must have **.pyo** extension. Note: **<script_name>** must match to the name of a file written by **#WSCRIPT** in order to have it run. Note: the command does not check whether a textual script named **<script_name>** does exist or not in the Easy Script® related NVM. If the file **<script_name>** is not present at startup then the compiler will not execute.
AT#ESCRIPT?	Read command reports as a quoted string the file name of the **current script**.
AT#ESCRIPT=?	Test command returns **OK** result code.

5.1.6.12.3. Script Execution Start Mode - #STARTMODESCR

#STARTMODESCR - Script Execution Start Mode	**SELINT 2**
AT#STARTMODESCR= <script_start_mode> [,<script_start_to>]	Set command sets the **current script** (see **#ESCRIPT**) execution start mode. Parameter: **<script_start_mode>** - **currente script** execution start mode 0 - **current script** will be executed at startup only if the **DTR** line is found **Low** (that is: COM is not open on a PC), otherwise the Easy Script® interpreter will not execute and the MODULE will behave normally answering only to AT commands on the serial port (factory default). 1 - **current script** will be executed at startup only if the user does not send any AT command on the serial port for the time interval specified in **<script_start_to>** parameter, otherwise the Easy Script® interpreter will not execute and the MODULE will behave normally answering only to AT commands on the serial port. The **DTR** line is not tested. **<script_start_to>** - **current script** start time-out; 10..60 - time interval in seconds; this parameter is used only if parameter **<script_start_mode>** is set to 1; it is the waiting time for an AT command on the serial port to disable active script execution start. If the user does not send any AT command on the serial port for the time specified in this parameter active script will not be executed (default is 10).
AT#STARTMODESCR?	Read command reports the **current script** start mode and the **current script** start time-out, in the format: **#STARTMODESCR= <script_start_mode>,<script_start_timeout>**
AT#STARTMODESCR=?	Test command returns the range of available values for parameters **<script_start_mode>** and **<script_start_timeout>**, in the format: **#STARTMODESCR: (0,1),(10-60)**

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5.1.6.12.4. Execute Active Script - #EXECSCR

#EXECSCR - Execute Active Script	SELINT 2
AT#EXECSCR	Execution command causes the **current script** (see **#ESCRIPT**) execution not at startup. This command is useful when the execution at startup has been blocked deliberately and the user wants to control execution start.
AT#EXECSCR=?	Test command returns **OK** result code.

5.1.6.12.5. Read Script - #RSCRIPT

#RSCRIPT - Read Script	SELINT 2
AT#RSCRIPT= [<script_name>]	Execution command reports the content of file **<script_name>**. Parameter: **<script_name>** - file name, string type (max 16 chars, case sensitive). The device shall prompt a five character sequence **<CR><LF><less_than><less_than><less_than>** **(IRA 13, 10, 60, 60, 60)** followed by the file content. Note: If the file **<script_name>** is not present an error code is reported.
AT#RSCRIPT=?	Test command returns **OK** result code.
Example	AT#RSCRIPT="First.py " *hereafter receive the prompt; then the script is displayed, immediately after the prompt* <<<import MDM MDM.send('AT\r',10) Ans=MDM.receive(20) OK

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5.1.6.12.6. List Script Names - #LSCRIPT

#LSCRIPT - List Script Names	SELINT 2
AT#LSCRIPT	Execution command reports either the list of file names for the files currently stored in the Easy Script® related NVM and the available free NVM memory in the format: **[#LSCRIPT: <script_name1>,<size1>…** **[<CR><LF>#LSCRIPT: <script_name*n*>,<size*n*>]]** **<CR><LF>#LSCRIPT: free bytes: <free_NVM>** where: **<script-name*n*>** - file name, quoted string type (max 16 chars, case sensitive) **<size*n*>** - size of script in bytes **<free_NVM>** - size of available NVM memory in bytes
AT#LSCRIPT=?	Test command returns **OK** result code.
Example	AT#LSCRIPT #LSCRIPT: "First.py",51 #LSCRIPT: "Second.py",178 #LSCRIPT: "Third.py",95 #LSCRIPT: free bytes: 20000 OK

#LCSCRIPT - List Script Names	SELINT 2
AT#LCSCRIPT	Execution command reports either the list of file names for the files currently stored in the Easy Script® related NVM, adding CRC16 information, and the available free NVM memory in the format: **[#LCSCRIPT: <script_name1>,<size1>[,<crc1>]…** **[<CR><LF>#LCSCRIPT: <script_name*n*>,<size*n*>[,<crc*n*>]]]** **<CR><LF>#LCSCRIPT: free bytes: <free_NVM>** where: **<script-name*n*>** - file name, quoted string type (max 16 chars, case sensitive) **<size*n*>** - size of script in bytes **<crc*n*>** - CRC16 poly (x^16+x^12+x^5+1) of script in hex format **<free_NVM>** - size of available NVM memory in bytes Note: CRC16 is calculated using the standard reversed CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation, reversed) with initial value FFFF. Note: if one file currently stored in NVM is in use than CRC16 cannot be calculated and execution command does not report **<crc*n*>** for that file. This is always true if command is executed by a Python script because at least the file pointed by #ESCRIPT is in use.

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#LCSCRIPT - List Script Names	**SELINT 2**
AT#LCSCRIPT= <script_name>	Execution command reports size and CRC16 information of file **<script_name>** in the format: **[#LCSCRIPT: <script_name>,<size>[,<crc>]]** where: **<script-name>** - file name, quoted string type (max 16 chars, case sensitive) **<size>** - size of script in bytes **<crc>** - CRC16 poly (x^16+x^12+x^5+1) of script in hex format Parameter: **<script_name>** - file name, string type (max 16 chars, case sensitive). Note: CRC16 is calculated using the standard reversed CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation, reversed) with initial value FFFF. Note: if file **<script_name>** is in use than CRC16 cannot be calculated and execution command does not report **<crc>**. Note: if file **<script_name>** is not in the list of files stored in NVM execution command exits with error message.
AT#LCSCRIPT=?	Test command returns **OK** result code.
Example	AT#LCSCRIPT #LCSCRIPT: “First.py”,51,8FD6 #LCSCRIPT: “Second.py”,178,A034 #LCSCRIPT: “Third.py”,120,7C48 #LCSCRIPT: free bytes: 20000 OK AT#LCSCRIPT=“Second.py” #LCSCRIPT: “Second.py”,178,A034 OK If file Third.py is already in use. AT#LCSCRIPT #LCSCRIPT: “First.py”,51,8FD6 #LCSCRIPT: “Second.py”,178,A034 #LCSCRIPT: “Third.py”,120 #LCSCRIPT: free bytes: 20000 OK

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5.1.6.12.7. Delete Script - #DSCRIPT

#DSCRIPT - Delete Script	SELINT 2
AT#DSCRIPT=[<script_name>]	Execution command deletes a file from Easy Script® related NVM memory. Parameter: **<script_name>** - name of the file to delete, string type (max 16 chars, case sensitive) Note: if the file **<script_name>** is not present an error code is reported.
AT#DSCRIPT=?	Test command returns **OK** result code.
Example	AT#DSCRIPT="Third.py" OK

5.1.6.12.8. Delete All Scripts - #DASCRIPT

#DASCRIPT – Delete All Scripts	SELINT 2
AT#DASCRIPT	Execution command deletes all files from Easy Script® related NVM memory. Note: if product supports directories execution command deletes all files from current working directory, it does not delete directories.
AT#DASCRIPT=?	Test command returns **OK** result code.

5.1.6.12.9. Reboot - #REBOOT

#REBOOT - Reboot	SELINT 2
AT#REBOOT	Execution command reboots immediately the unit. It can be used to reboot the system after a remote update of the script in order to have the new one running. Note: if AT#REBOOT follows an AT command that stores some parameters in NVM, it is recommended to insert a delay of at least 5 seconds before to issue AT#REBOOT, to permit the complete NVM storing Note: AT#REBOOT is an obsolete AT command; please refer to AT#ENHRST to perform a module reboot

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#REBOOT - Reboot	**SELINT 2**
AT#REBOOT=?	Test command returns **OK** result code.
Example	AT#REBOOT OK … Module Reboots …

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5.1.6.13. SIM Toolkit Commands

5.1.6.13.1. SIM Tookit Interface Activation - #STIA

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

#STIA - SIM Toolkit Interface Activation	SELINT 2

type of **proactive command** issued by the SIM:

#STN: <cmdType>

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

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

an unsolicited notification will be sent to the user:

#STN: <cmdType>,<refresh type>

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

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

if ***<cmdType>=17*** *(SEND SS)*
if ***<cmdType>=19*** *(SEND SHORT MESSAGE)*
if ***<cmdType>=20*** *(SEND DTMF)*
if ***<cmdType>=32*** *(PLAY TONE)*

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

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

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

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

In case of SEND SHORT MESSAGE (**<cmdType>**=19) command if sending

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#STIA - SIM Toolkit Interface Activation	SELINT 2

to network fails an unsolicited notification will be sent

#STN: 119

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

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

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

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

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

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

an unsolicited notification will be sent:

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

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

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

#STIA - SIM Toolkit Interface Activation	SELINT 2

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

an unsolicited notification will be sent to the user:

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

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

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

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

an unsolicited notification will be sent:

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

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

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

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

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

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#STIA - SIM Toolkit Interface Activation	SELINT 2

an unsolicited notification will be sent to the user:

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

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

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

All other commands:

the unsolicited indication will report just the proactive command type:

#STN: <cmdType>

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

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

where
<cmdTerminateValue>
150 - SMS control response
160 - call/SS/USSD response
<Result>
0 - Call/SMS not allowed
1 - Call/SMS allowed
2 - Call/SMS allowed with modification
<Number> - Called number, Service Center Address or SS String in ASCII format.
<MODestAddr> - MO destination address in ASCII format.
<TextInfo> - alpha identifier provided by the SIM in ASCII format.

Note: an unsolicited result code

#STN: 254

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#STIA - SIM Toolkit Interface Activation	SELINT 2
	is sent if the user has indicated the need to end the proactive SIM application session (**AT#STSR=<cmdType>,**16 i.e. "proactive SIM application session terminated by the user" according to GSM 11.14). The TA does not need to respond directly, i.e. **AT#STSR** is not required. It is possible to restart the SAT session from the main menu again with the command **AT#STGI=37**. Note: The settings are saved on user profile and available on following reboot. SIM Toolkit activation/deactivation is only performed at power on. Note: if **#ENS=1** then the **<mode>** parameter is set to 2
AT#STIA?	Read command can be used to get information about the SAT interface in the format: **#STIA: <state>,<mode>,<timeout>,<SatProfile>** where: **<state>** - the device is in one of the following state: 0 - SIM has not started its application yet 1 - SIM has started its application (SAT main menu ready) **<mode>** - SAT and unsolicited indications enabling status (see above) **<timeout>** - time-out for user responses (see above) **<SatProfile>** - SAT Terminal Profile according to GSM 11.14, i. e. the list of SIM Application Toolkit facilities that are supported by the ME. The profile cannot be changed by the TA. Note: In SAT applications usually an SMS message is sent to the network provider containing service requests, e.g. to send the latest news. The provider returns a message with the requested information. Before activating SAT it is recommended to set the SMS text mode with command **AT+CMGF=1** and to enable unsolicited indications for incoming SMS messages with command **+CNMI**.
AT#STIA=?	Test command returns the range of available values for the parameters **<mode>** and **<timeout>**.
Note	Just one instance at a time, the one which first issued **AT#STIA=*n*** (with ***n*** different from zero), is allowed to issue SAT commands, and this is valid till the same instance issues **AT#STIA=0**. After power cycle another instance can enable SAT.
Note	A typical SAT session on AT interface starts after an **#STN: 37** unsolicited code is received, if enabled(see above). At that point usually an **AT#STGI=37** command is issued (see **#STGI**), and after the SAT main menu has been displayed on TE an **AT#STSR=37,0,x** command is issued to select an item in the menu (see **#STSR**).

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5.1.6.13.2. SIM Tookit Get Information - #STGI

#STGI - SIM Tookit Get Information	SELINT 2
AT#STGI=[<cmdType>]	**#STGI** set command is used to request the parameters of a **proactive command** from the ME. Parameter: **<cmdType>** - **proactive command** ID according to GSM 11.14 (decimal); these are only those command types that use the AT interface; SAT commands which are not using the AT interface (not MMI related SAT commands, e.g. PROVIDE LOCAL INFORMATION) are executed without sending any indication to the user 1 - REFRESH 5 – SET UP EVENT LIST 16 - SET UP CALL 17 - SEND SS 18 - SEND USSD 19 - SEND SHORT MESSAGE 20 - SEND DTMF 32 - PLAY TONE 33 - DISPLAY TEXT 34 - GET INKEY 35 - GET INPUT 36 - SELECT ITEM 37 - SET UP MENU 40 – SET UP IDLE MODE TEXT 64 – OPEN CHANNEL Requested command parameters are sent using an **#STGI** indication: **#STGI: <parameters>** where **<parameters>** depends upon the ongoing **proactive command** as follows: *if **<cmdType>=1** (REFRESH)* **#STGI: <cmdType>,<refresh type>** where: **<refresh type>** 0 - SIM Initialization and Full File Change Notification; 1 - File Change Notification; 2 - SIM Initialization and File Change Notification; 3 - SIM Initialization; 4 - SIM Reset *if **<cmdType>=5** (SET UP EVENT LIST)*

#STGI - SIM Tookit Get Information	SELINT 2

#STGI: <cmdType>,<event list mask>
where:
<event list mask> - hexadecimal number representing the list of events to monitor (see GSM 11.14):

- '00' = MT call
- '01' = Call connected
- '02' = Call disconnected
- '03' = Location status
- '04' = User activity
- '05' = Idle screen available
- '06' = Card reader status (if class "a" is supported)
- '07' = Language selection
- '08' = Browser Termination (if class "c" is supported)
- '09' = Data available (if class "e" is supported)
- '0A' = Channel status (if class "e" is supported)

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

if ***<cmdType>=16*** *(SET UP CALL)*

#STGI: <cmdType>,<commandDetails>,[<confirmationText>],
<calledNumber>where:
<commandDetails> - unsigned integer, used as an enumeration
0 Set up call, but only if not currently busy on another call
1 Set up call, but only if not currently busy on another call, with redial
2 Set up call, putting all other calls (if any) on hold
3 Set up call, putting all other calls (if any) on hold, with redial
4 Set up call, disconnecting all other calls (if any)
5 Set up call, disconnecting all other calls (if any), with redial
<confirmationText> - string for user confirmation stage
<calledNumber> - string containing called number

if ***<cmdType>=17*** *(SEND SS)*
if ***<cmdType>=18*** *(SEND USSD)*
if ***<cmdType>=19*** *(SEND SHORT MESSAGE)*
if ***<cmdType>=20*** *(SEND DTMF)*
if ***<cmdType>=32*** *(PLAY TONE)*
if ***<cmdType>=40*** *(SET UP IDLE MODE TEXT)*
if ***<cmdType>=64*** *(OPEN CHANNEL)*

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

where:
<text> - text to be displayed to user

#STGI - SIM Tookit Get Information	SELINT 2

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

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

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

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

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

where:
<commandDetails> - unsigned Integer used as a bit field.
0..255 - used as a bit field:
bit 1:
0 - Digits only (0-9, *, # and +)
1 - Alphabet set;
bit 2:
0 - SMS default alphabet (GSM character set)
1 - UCS2 alphabet
bit 3:
0 - Character sets defined by bit 1 and bit 2 are enabled
1 - Character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested
bits 4 to 7:
0
bit 8:
0 - No help information available
1 - Help information available
<text> - String as prompt for text.

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

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

#STGI - SIM Tookit Get Information	SELINT 2

<responseMax>[,<defaultText>]

where:
<commandDetails> - unsigned Integer used as a bit field.
0..255 - used as a bit field:

bit 1:
0 - Digits only (0-9, *, #, and +)
1 - Alphabet set

bit 2:
0 - SMS default alphabet (GSM character set)
1 - UCS2 alphabet

bit 3:
0 - ME may echo user input on the display
1 - User input shall not be revealed in any way. Hidden entry mode (see GSM 11.14) is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.

bit 4:
0 - User input to be in unpacked format
1 - User input to be in SMS packed format

bits 5 to 7:
0

bit 8:
0 - No help information available
1 - Help information available

<text> - string as prompt for text
<responseMin> - minimum length of user input
0..255
<responseMax> - maximum length of user input
0..255
<defaultText> - string supplied as default response text

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

The first line of output is:

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

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

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

where:
<commandDetails> - unsigned Integer used as a bitfield
0..255 - used as a bit field:

#STGI - SIM Tookit Get Information	SELINT 2

bit 1:
0 - Presentation type is not specified
1 - Presentation type is specified in bit 2
bit 2:
0 - Presentation as a choice of data values if bit 1 = '1'
1 - Presentation as a choice of navigation options if bit 1 is '1'
bit 3:
0 - No selection preference
1 - Selection using soft key preferred
bits 4 to 7:
0
bit 8:
0 - No help information available
1 - Help information available

<numOfItems> - number of items in the list
<titleText> - string giving menu title
<itemId> - item identifier
1..**<numOfItems>**
<itemText> - title of item
<nextActionId> - the next proactive command type to be issued upon execution of the menu item.
0 - no next action information available.

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

The first line of output is:

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

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

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

where:
<commandDetails> - unsigned Integer used as a bitfield
0..255 - used as a bit field:
bit 1:
0 - no selection preference
1 - selection using soft key preferred
bit 2 to 7:
0
bit 8:
0 - no help information available
1 - help information available

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#STGI - SIM Tookit Get Information	**SELINT 2**
	<numOfItems> - number of items in the list **<titleText>** - string giving menu title **<itemId>** - item identifier 1..**<numOfItems>** **<itemText>** - title of item **<nextActionId>** - the next proactive command type to be issued upon execution of the menu item. 0 - no next action information available. Note: upon receiving the **#STGI** response, the TA must send **#STSR** command (see below) to confirm the execution of the proactive command and provide any required user response, e.g. selected menu item.
AT#STGI?	The read command can be used to request the currently ongoing **proactive command** and the SAT state in the format **#STGI: <state>,cmdType>** where: **<state>** - SAT interface state (see **#STIA**) **<cmdType>** - ongoing proactive command An error message will be returned if there is no pending command.
AT#STGI=?	Test command returns the range for the parameters **<state>** and **<cmdType>**.
Note	The unsolicited notification sent to the user: **#STN: 37** is an indication that the main menu of the SIM Application has been sent to the TA. It will be stored by the TA so that it can be displayed later at any time by issuing an **AT#STGI=37** command. A typical SAT session on AT interface starts after an **#STN: 37** unsolicited code is received, if enabled. At that point usually an **AT#STGI=37** command is issued, and after the SAT main menu has been displayed on TE an **AT#STSR=37,0,x** command is issued to select an item in the menu (see below). The session usually ends with a SIM action like sending an SMS, or starting a call. After this, to restart the session from the beginning going back to SAT main menu it is usually required an **AT#STSR=37,16** command. The unsolicited notification sent to the user: **#STN:237** is an indication that the main menu of the SIM Application has been removed from the TA, and it is no longer available. In this case **AT#STGI=37** command response will be always **ERROR**.

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#STGI - SIM Tookit Get Information	SELINT 2

5.1.6.13.3. SIM Tookit Send Response - #STSR

#STSR - SIM Tookit Send Response	SELINT 2
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 GSM 11.14 (see **#STGI**) **<userResponse>** - action performed by the user 0 - command performed successfully (call accepted in case of call setup, start connection in case of open channel request) 16 - proactive SIM session terminated by user 17 - backward move in the proactive SIM session requested by the user 18 - no response from user 19 - help information required by the user 20 - USSD/SS Transaction terminated by user 32 - TA currently unable to process command 34 - user has denied SIM call setup request 35 - user cleared down SIM call before connection or network release **<data>** - data entered by user, depending on **<cmdType>**, only required if **<Result>** is 0: ***Get Inkey*** **<data>** contains the key pressed by the user; used character set should be the one selected with **+CSCS**. Note: if, as a user response, a binary choice (Yes/No) is requested by the SIM application using bit 3 of the **<commandDetails>** parameter the valid content of the **<inputString>** is: a) "IRA", "8859-1", "PCCP437" charsets: "Y" or "y" (positive answer) and "N" or "n" (negative answer) b) UCS2 alphabet "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer) ***Get Input*** **<data>** - contains the string of characters entered by the user (see above) ***Select Item*** **<data>** - contains the item identifier selected by the user Note: Use of icons is not supported. All icon related actions will respond with no icon available.

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#STSR - SIM Tookit Send Response	SELINT 2
AT#STSR?	The read command can be used to request the currently ongoing **proactive command** and the SAT state in the format **#STSRI: <state>,<cmdType>** where: **<state>** - SAT interface state (see **#STIA**) **<cmdType>** - ongoing proactive command An error message will be returned if there is no pending command.
AT#STSR=?	Test command returns the range for the parameters **<state>** and **<cmdType>**.

5.1.6.13.4. SIM Tookit terminal Attach - #STTA

#STTA – SIM Toolkit Terminal Attach	SELINT 2
AT#STTA=<state>	This command attaches/detaches the SIM Toolkit application to the AT instance reserved for this use (see #STACFG). 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: <state>**
AT#STTA=?	Test command reports the supported range of values for parameter **<state>**
Note	The AT instance reserved for the SIM Toolkit application is setted by the command #STACFG (default is #3).

5.1.6.13.5. Configure SIM Toolkit Application parameters - STACFG

#STACFG – Configure SIM Toolkit Application parameters	SELINT 2
AT#STACFG=<instance> [, <UNUSED_1>[, <UNUSED_2>]	Set command configures the SIM Toolkit Application. Parameters: **<instance>:** AT instance that will be used by the SIM Toolkit Application (see

	#STTA). Range 1 - 5, default 3. <**UNUSED_1**>: reserved for future use <**UNUSED_2**>: reserved for future use Note: <**instance**> parameter can be setted only if <**state**> parameter of **#STTA** is set to 0, otherwise the set command returns ERROR. Note: an ERROR is issued if <**UNUSED_1**> and <**UNUSED_2**> parameters are set with a value different from 0.
AT#STACFG?	Read command returns the current settings of parameters in the format: **# STACFG:<instance>,0,0**
AT#STACFG =?	Test command returns the supported values for the **#STACFG** parameters

5.1.6.14. Phonebook AT Commands Set

5.1.6.14.1. Read Group Entries - #CPBGR

#CPBGR- Read Group Entries	**SELINT 2**
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

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5.1.6.14.2. Write Group Entries - #CPBGW

#CPBGW - Write Group Entry	SELINT 2
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 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)**

5.1.6.15. GPS AT Commands Set

5.1.6.15.1. GPS NVRAM Parameters Delete - $GPSNVRAM

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

5.1.6.15.2. GPS Quality of Service - $GPSQOS

$GPSQOS – GPS Quality Of Service	**SELINT 2**
AT$GPSQOS =[<horiz_accuracy>[,<vertic_accuracy>[,<rsp_time>[,<age_of_location_info>[,<location_type>[,< nav_profile>[,< velocity_request>]]]]]]]	Command used to set the location's quality of service (QoS). Parameter: **<horiz_accuracy>** (horizontal accuracy): 0 – 1800000, where 0 is highest accuracy and 1800000 is lowest accuracy in meters. Default value is 1800000 in meters **<vertic_accuracy>** (vertical accuracy): 0 – 990, where 0 is highest accuracy and 990 is lowest accuracy in meters. Default is 990 in meters **<rsp_time>** (response time):

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

5.1.6.15.3. GPS Start Location Service Request - $GPSSLSR

$GPSSLSR – GPS Start Location Service Request	**SELINT 2**
$GPSSLSR = <transport_protocol>[,<pos_mode>[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,<interval>[,<service_type_id>[,<pseudonym_indicator>]]]]]]	Command used to start the Receiver in Autonomous or A-GPS mode. Parameter: **<transport_protocol>**: 0 - CPlane 1 - SUPL 2 – Invalid Note: If **<pos_mode** > is Autonomous the **<transport_protocol>** should be invalid. Note: If **<transport_protocol>** is CPlane and **<pos_mode** > is Pure MS Assisted, then **<interval>** should be 0 (or omitted). **<pos_mode>** : 0: Pure MS Assisted - Location estimate from the network (MS Assisted mode). 1: MS Based - Assistance Data from the network (MS Based mode). 2: MS Assisted Based - Combination of MS-A and MS-B modes, location estimate computed both at UE and Network. 3: Autonomous – Autonomous GPS mode of operation. Note: If **<pos_mode>** is Autonomous the <transport_protocol> should be invalid. **<client_id>** : String parameter containing the ID of the LCS-Client to which the location estimate is to be transferred. Note: **<client_id>** is mandatory in case of A-GPS and the **<transport_protocol>** should be Cplane. **<clientid_type>** : 0 – MSISDN 1 – Invalid (default) Note: **<client_id>** and **<clientid_type>** are mandatory for A-GPS mode. **<mlc_number>** : String parameter containing the address of the GMLC through which the location estimate is to be sent to the LCS-Client. Note: **<mlc_number>** is mandatory in case of A-GPS. **<mlcnumber_type>** : 0 – MSISDN 1 – Invalid (default) Note: **<mlc_number>** and **<mlcnumber_type>** are mandatory for A-GPS mode.

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	<interval> : 0 - 7200: GPS reporting period in seconds (will be sent unsolicited). if the value is 0 then a single shot NMEA Message will be provided Any value different from 0 sets the period (in seconds) between each NMEA Sentence. NOTE: If this value is not set, it is assumed to be 0. NOTE: The Unsolicited NMEA sentences have to be enabled with the commands AT$GPSNMUN **<service_type_id>** : 0 - 255 where 255 indicates that this parameter shall not be used. Note: <service_type_id> is mandatory in case of A-GPS. **< pseudonym_indicator>** : 0 FALSE (default) : display user name at the external client 1 TRUE : display user name as anonymous at the external client If C-plane or Supl session is not successfully completed then an unsolicited indication reports the error cause in the following formats: **$GPSSLSR: C-PLANE ERROR,NETWORK ERROR, <error_code>** where **<error_code>** 0 SS_NET_ERROR_INTERNAL_SS_ERROR 1 SS_NET_ERROR_UNKNOWN_SUBSCRIBER 9 SS_NET_ERROR_ILLEGAL_SUBSCRIBER 10 SS_NET_ERROR_BEARERSERVICE_NOT_ PROVISIONED 11 SS_NET_ERROR_TELESERVICE_NOT_PROVISIONED 12 SS_NET_ERROR_ILLEGAL_EQUIPMENT 13 SS_NET_ERROR_CALL_BARRED 16 SS_NET_ERROR_ILLEGAL_SS_OPERATION 17 SS_NET_ERROR_ERROR_STATUS 18 SS_NET_ERROR_NOT_AVAILABLE 19 SS_NET_ERROR_SUBSCRIPTION_VIOLATION 20 SS_NET_ERROR_INCOMPATABILITY 21 SS_NET_ERROR_FACILITY_NOT_SUPPORTED 27 SS_NET_ERROR_ABSENT_SUBSCRIBER 29 SS_NET_ERROR_SHORT_TERM_DENIAL 30 SS_NET_ERROR_LONG_TERM_DENIAL 34 SS_NET_ERROR_SYSTEM_FAILURE 35 SS_NET_ERROR_DATA_MISSING 36 SS_NET_ERROR_UNEXPECTED_DATA_VALUE 37 SS_NET_ERROR_PW_REGISTRATION_FAILURE 38 SS_NET_ERROR_NEGATIVE_PW_CHECK 43 SS_NET_ERROR_NUMBER_OF_PW_ATTEMPTS_

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	VIOLATION 54 SS_NET_ERROR_POS_METHOD_FAILURE 71 SS_NET_ERROR_UNKNOWN_ALPHABET 72 SS_NET_ERROR_USSD_BUSY 121 SS_NET_ERROR_REJECTED_BY_USER 122 SS_NET_ERROR_REJECTED_BY_NETWORK 123 SS_NET_ERROR_DEFLECTION_TO_SERVED_ SUBSCRIBER 124 SS_NET_ERROR_SPECIAL_SERVICE_CODE 125 SS_NET_ERROR_INVALID_DEFLECTED_TO_NUMBER 126 SS_NET_ERROR_MAX_NUMBER_OF_MPTY_ PARTICIPANTS_EXCEEDED 127 SS_NET_ERROR_RESOURCES_NOT_AVAILABLE 255 SS_NET_ERROR_INTERNAL_SS_TIME_OUT or **$GPSSLSR: C-PLANE ERROR,NETWORK REJECT CAUSE, <error_code>** where **<error_code>** 0 SS_NET_REJECT_UNRECOGNIZED_COMPONENT 1 SS_NET_REJECT_MISTYPED_COMPONENT 2 SS_NET_REJECT_BADLY_STRUCTURED_COMPONENT 3 SS_NET_REJECT_DUPLICATE_INVOKE_ID 4 SS_NET_REJECT_UNRECOGNIZED_OPERATION 5 SS_NET_REJECT_MISTYPED_PRO_PARAMETER 6 SS_NET_REJECT_RESOURCE_LIMITATION 7 SS_NET_REJECT_INITIATING_RELEASE 8 SS_NET_REJECT_UNRECOGNIZED_LINKED_ID 9 SS_NET_REJECT_LINKED_RESPONSE_UNEXPECTED 10 SS_NET_REJECT_UNEXPECTED_LINKED_OPERATION 11 SS_NET_REJECT_UNRECOGNIZED_INVOKE_ID 12 SS_NET_REJECT_RETURN_RESULT_UNEXPECTED 13 SS_NET_REJECT_MISTYPED_RES_PARAMETER 14 SS_NET_REJECT_UNRECOGNIZED_ERROR_ INVOKE_ID 15 SS_NET_REJECT_RETURN_ERROR_UNEXPECTED 16 SS_NET_REJECT_UNRECOGNIZED_ERROR 17 SS_NET_REJECT_UNEXPECTED_ERROR 18 SS_NET_REJECT_MISTYPED_ERROR_PARAMETER 19 SS_NET_REJECT_UNKNOWN or **$GPSSLSR: C-PLANE ERROR,NETWORK GSM CAUSE,**

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	<error_code> where **<error_code>** 1 SS_GSM_ERROR_UNASSIGNED_NUMBER 3 SS_GSM_ERROR_NO_ROUTE 6 SS_GSM_ERROR_CHANNEL_UNACCEPTABLE 8 SS_GSM_ERROR_OPERATOR_BARRING 16 SS_GSM_ERROR_NORMAL_CALL_CLEARING 17 SS_GSM_ERROR_USER_BUSY 18 SS_GSM_ERROR_NO_USER_RESPONDING 19 SS_GSM_ERROR_USER_ALERTING_NO_ANSWER 21 SS_GSM_ERROR_CALL_REJECTED 22 SS_GSM_ERROR_NUMBER_CHANGED 26 SS_GSM_ERROR_NON_SELECTED_USER_CLEARING 27 SS_GSM_ERROR_DESTINATION_OUT_OF_ORDER 28 SS_GSM_ERROR_INVALID_NUMBER_FORMAT 29 SS_GSM_ERROR_FACILITY_REJECTED 30 SS_GSM_ERROR_RESPONSE_TO_STATUS_ENQUIRY 31 SS_GSM_ERROR_NORMAL_UNSPECIFIED 34 SS_GSM_ERROR_NO_CIRCUIT_AVAILABLE 38 SS_GSM_ERROR_NETWORK_OUT_OF_ORDER 41 SS_GSM_ERROR_TEMPORARY_FAILURE 42 SS_GSM_ERROR_SWITCH_CONGESTION 43 SS_GSM_ERROR_ACCESS_INFORMATION_ DISCARDED 44 SS_GSM_ERROR_REQUESTED_CIRCUIT_NOT_ AVAILABLE 47 SS_GSM_ERROR_RESOURCES_UNAVAILABLE 49 SS_GSM_ERROR_QUALITY_UNAVAILABLE 50 SS_GSM_ERROR_FACILITY_NOT_SUBSCRIBED 55 SS_GSM_ERROR_INCOMING_CALLS_BARRED_IN_ CUG 57 SS_GSM_ERROR_BEARER_CAPABILITY_NOT_ ALLOWED 58 SS_GSM_ERROR_BEARER_CAPABILITY_NOT_AVAILABLE 63 SS_GSM_ERROR_SERVICE_NOT_AVAILABLE 65 SS_GSM_ERROR_BEARER_SERVICE_NOT_ IMPLEMENTED 68 SS_GSM_ERROR_ACM_GREATER_OR_EQUAL_TO_ ACM_MAX 69 SS_GSM_ERROR_FACILITY_NOT_IMPLEMENTED 70 SS_GSM_ERROR_ONLY_RESTRICTED_DIGITAL 79 SS_GSM_ERROR_SERVICE_NOT_IMPLEMENTED 81 SS_GSM_ERROR_INVALID_TI 87 SS_GSM_ERROR_USER_NOT_IN_CUG 88 SS_GSM_ERROR_INCOMPATIBLE_DESTINATION

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	91 SS_GSM_ERROR_INVALID_TRANSIT_NETWORK 95 SS_GSM_ERROR_SEMANTICS_INCORRECT 96 SS_GSM_ERROR_INVALID_MANDATORY_ INFORMATION 97 SS_GSM_ERROR_UNKNOWN_MESSAGE_TYPE1 98 SS_GSM_ERROR_UNEXPECTED_MESSAGE_TYPE 99 SS_GSM_ERROR_UNEXPECTED_IE 100 SS_GSM_ERROR_CONDITIONAL_IE_ERROR 101 SS_GSM_ERROR_UNKNOWN_MESSAGE_TYPE2 102 SS_GSM_ERROR_RECOVERY_ON_TIMER_EXPIRY 111 SS_GSM_ERROR_PROTOCOL_ERROR 127 SS_GSM_ERROR_INTERWORKING or **$GPSSLSR: C-PLANE ERROR,SS LCS CAUSE,<error_code>** where **<error_code>** 257 SS_LCS_OUTOF_MEMORY 258 SS_LCS_INVALID_PARAM or **$GPSSLSR: SUPL ERROR,<error_code>** where **<error_code>** 0 LCS_ERROR_SUPL_UNSPECIFIED 1 LCS_ERROR_SUPL_SYSTEM_FAILURE 2 LCS_ERROR_SUPL_UNEXPECTED_MESSAGE 3 LCS_ERROR_SUPL_PROTOCOL_ERROR 4 LCS_ERROR_SUPL_DATA_MISSING 5 LCS_ERROR_SUPL_UNEXPECTED_DATA_VALUE 6 LCS_ERROR_SUPL_POS_METHOD_FAILURE 7 LCS_ERROR_SUPL_POS_METHOD_MISMATCH 8 LCS_ERROR_SUPL_POS_PROTOCOL_MISMATCH 9 LCS_ERROR_SUPL_TARGET_SET_NOT_REACHABLE 10 LCS_ERROR_SUPL_VERSION_NOT_SUPPORTED 11 LCS_ERROR_SUPL_RESOURCE_SHORTAGE 12 LCS_ERROR_SUPL_INVALID_SESSION_ID 15 LCS_ERROR_SUPL_POSITIONING_NOT_PERMITTED 16 LCS_ERROR_SUPL_AUTH_NET_FAILURE or **$GPSSLSR: SOCKET ERROR,<error_code>**

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	where **<error_code>** -1 INET_RES_SOCKET_ERROR -114 INET_RES_UNDEFINED -115 INET_RES_ACCESS -116 INET_RES_ADDRINUSE -117 INET_RES_ADDRNOTAVAIL -118 INET_RES_AFNOSUPPORT -119 INET_RES_ALREADY -120 INET_RES_BADF -121 INET_RES_CONNABORTED -122 INET_RES_CONNREFUSED -123 INET_RES_CONNRESET -124 INET_RES_DESTADDRREQ -125 INET_RES_FAULT -126 INET_RES_HOSTDOWN -127 INET_RES_HOSTUNREACH -128 INET_RES_INPROGRESS -129 INET_RES_INTR -130 INET_RES_INVAL -131 INET_RES_ISCONN -132 INET_RES_MFILE -133 INET_RES_MSGSIZE -134 INET_RES_NETDOWN -135 INET_RES_NETRESET -136 INET_RES_NETUNREACH -137 INET_RES_NOBUFS -138 UTA_INET_RES_NOPROTOOPT -139 UTA_INET_RES_NOTCONN -140 UTA_INET_RES_NOTSOCK -141 UTA_INET_RES_OPNOTSUPP -142 UTA_INET_RES_PFNOSUPPORT -143 UTA_INET_RES_PROTONOSUPPORT -144 UTA_INET_RES_PROTOTYPE -145 UTA_INET_RES_SHUTDOWN -146 UTA_INET_RES_SOCKTNOSUPPORT -147 UTA_INET_RES_TIMEDOUT -148 UTA_INET_RES_WOULDBLOCK -149 UTA_INET_RES_SEC_SSLERROR -150 UTA_INET_RES_SEC_ERRFILE -151 UTA_INET_RES_SPECIFIC Other ERROR or

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	$GPSSLSR: ERROR
AT$GPSSLSR?	Read command returns the current settings, in the format: **$GPSSLSR: <transport_protocol>[,<pos_mode >[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,< interval> [,<service_type_id> [,<pseudonym_indicator>]]]]]]**
AT$GPSSLSR=?	**$GPSSLSR: (0-2),(0-3),(64),(0,1),(64),(0,1),(0-7200),(0-255),(0,1)**
Example	**AT$GPSSLSR= 2,3,,,,,1** **OK**
Note	The current setting is stored through $GPSSAV

5.1.6.15.4. GPS Stop Location Service Request - $GPSSTOP

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

5.1.6.15.5. Update SLP address - $LCSSLP

$LCSSLP - Update SLP address	**SELINT 2**
AT$LCSSLP=<slp_address_type>[,<slp_address>[,<slp_port_number>]]	Set command allows updating the SLP address and SLP port number. Parameters: **<slp_address_type>**: SLP address type 0 - IPv4 1 - FQDN 2 – IMSI (default value) **<slp_address>**: SLP address in FQDN format or IPv4 format **<slp_port_number>** : Slp Port number integer parameter. Default value is 7275 Note: If **<slp_address_type>** is 0 and 1, then **<slp_address>** is a

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	mandatory parameter. Note: The current setting is stored in NVM.
AT$LCSSLP?	Read command returns the current SLP address.
AT$LCSSLP=?	Test command returns the range of values for parameter **<slp_address_type>**.

5.1.6.15.6. Update location information - $LCSLUI

$LCSLUI - Update location information	**SELINT 2**
AT$LCSLUI=<update_type>	Set command allows updating the Location information. Parameters: **<update_type>** : the current access technology 0 - GSM 1 - WCDMA Note: the current access technology can be read with AT+COPS?
AT$LCSLUI=?	Test command returns the range of values for parameter <update_type>.

5.1.6.15.7. Update terminal information - $LCSTER

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

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5.1.6.15.8. Enable/Disable unsolicited response - $LICLS

$LICLS – Enable/Disable unsolicited response	**SELINT 2**
AT$LICLS =<mode>	Set command is used to enable/disable unsolicited $LICLS response. Parameter: **<mode>** 0 – disable unsolicited 1 – enable unsolicited (default value) The unsolicited result code is in the format: $LICLS: **<request_type>[,<cid>]** Where **<request_type>** 0 – Setup Request to setup the control link 1 – Release Request to release the control link **<cid>** : id associated to the context that shall be deactivated (see +CGDCONT) If the <request_type> is a setup request, the unsolicited indication is sent/used to request the client to define, setup, activate and prepare the pdp-context. If <request_type> is a release request, the unsolicited indication is sent/used to inform the client that the pdp-context (associated with this command type) including the associated terminal is not used any more, and shall be deactivated. Note: The current setting is stored in NVM.
AT$LICLS?	Read command returns the current value of parameter <mode>.
AT$LICLS=?	Test command returns the range of values for parameter <mode>.

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5.1.6.15.9. MT Location Request Mode - $LCSLRMT

$LCSLRMT – MT Location Request Mode	SELINT 2
AT$LCSLRMT=<mode>	Set command is used to enable/disable unsolicited $LCSLRMT response. Parameter: **<mode>** 0 – disable unsolicited 1 – enable unsolicited (default value) The unsolicited result code is in the format: **$LCSLRMT: <transport_protocol>,<Notif_type>, <Loc_estimate_type>,<Client_Id>,<Client_NameEncoding_type>,<Client_Name_Type>,<Client_Name>,<Requestor_Id_Encoding_type>,<Requestor_Id_Type>,<Requestor_Id>,<Codeword>,<Service_Type_id>,<reqid>** Where **<transport_protocol>** 0 -C-Plane protocol 1 - SUPL Protocol 2 - Invalid **<Notif_type>** 0 - Notify 1 - Verify request (no response will be treated as permission grantet, see $LCSLRV) 2 - Verify request (no response will be treated as permission denied, see $LCSLRV) **<Loc_estimate_type>** 0 - Current location 1 - Current or Last location known 2 - Initial location **<Requestor_Id_Encoding_type>** **<Client_Name _Encoding_type>** 0 – UCS2 1 - GSM default format 2 - UTF-8 format 3 – invalid format **<Client_Name_Type>** **<Requestor_Id_Type>** 0 - MSISDN. 1 – IMSI.

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	2 – IPV4. 3 – IPV6. 4 – logical name. 5 – email-address. 6 – URL 7 – SIP URL. 8 – IMS Public Identity. 9 – USSD type. 10 – invalid type **<Client_Name>** **<Requestor_Id>** **<Codeword>** is displayed as per data coding scheme. **<Service_Type_id>** 0-127 **<reqid>** Integer that identifies the request. Note: **<reqid>** uniquely identifies the MT-LR sent by the network and the same **<reqid>** shall be returned in AT$LCSLRV command in case the **<Notif_type>** is of type "Verify request" Note: The current setting is stored in NVM.
AT$LCSLRMT?	Read command returns the current value of parameter <mode>.
AT$LCSLRMT=?	Test command returns the range of values for parameter <mode>.

5.1.6.15.10. Location request verification - $LCSLRV

$LCSLRV – Location request verification	**SELINT 2**
AT$LCSLRV=<permission>,<reqid>	Set command is used to verify a location request coming from the network. The verification is sent back to the network with request id. Parameter: **<permission>** 0 – permission denied (default value) 1 – permission granted **<reqid>** uniquely identifies the MT-LR sent by the network
AT$LCSLRV=?	Test command returns the range of values for parameter <permission>.

5.1.6.15.11. LCS certificate - $LTC

$LTC – LCS certificate	**SELINT 2**
AT$LTC=<string>,<total_message_length>,<seq_no>,<Security_Object_Type>	Set command is used to pass the security objects (e.g. certificate, key) to the Transport Layer Security Protocol (binary string). The certificate shall be in hexadecimal format (each octet of the certificate is given as two IRA character long hexadecimal number). Parameter: **<string>** - the string certificate segment (max 300 characters per segment) **<total_message_length>** - The total size of the certificate to be received 1-4096 **<seq_no>** - The sequence number of the segment. 1-13 **<Security_Object_Type>** 0: Root Certificate NOTE: The last two certificates are stored in NVM.
AT$LTC	Execution command deletes the certificates stored in NVM.
AT$LTC?	Read command provides the first 300 characters of each valid certificate stored in NVM in the format: **$LTC: <string>,<total_message_length>,1, <Security_Object_Type>** If no certificate is stored the read command provides: **$LTC: “”,0,1 ,<Security_Object_Type>**
AT$LTC=?	Test command returns the range of values for parameters **<total_message_length>**,**<seq_no>** and **<Security_Object_Type>**

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5.1.6.15.12. Lock context for LCS use - $LCSLK

$LCSLK – Lock context for LCS use	SELINT 2
AT$LCSLK=<mode>[,<cid>]	Set command is used to reserve a cid for LCS. Parameters: **<mode>** 0 – unlock the current cid available for LCS use 1 – lock the specified cid in order to setup/release a control link for LCS use only **<cid>** - PDP context identifier 1..5 - numeric parameter which specifies a particular PDP context definition Note: **<cid>** is mandatory if **<mode>** is set to lock, otherwise shall be omitted. Note: the set command returns ERROR if the current cid and/or the previously set are in use. Note: The current setting is stored in NVM.
AT$LCSLK?	Read command returns the current value of parameters **<mode>** and **<cid>** (if **<mode>** is lock).
AT$LCSLK=?	Test command returns the range of values for parameters **<mode>** and **<cid>**

5.1.6.15.13. GNSS Receiver Configuration

5.1.6.15.13.1. GNSS device type set - $GPSD

$GPSD - GNSS Device Type Set	SELINT 2
AT$GPSD=<device_type>[,<sub_device_type>]	Set command defines which GNSS receiver is connected to the module. It reserves the Serial port #1 of the module (TRACE) to receive the data stream coming from the attached GNSS module. Parameter: **<device type>** 0 - none; the serial port is not connected to the GNSS device and available for standard use 1 - currently has no meaning, maintained for backward compatibility 2 - serial port connected to the GNSS serial port: controlled mode. This configuration is for SiRF StarIV-based GNSS modules support only (JF2-FLASH, JF2-ROM and JF2-ROM+EEPROM) 3 - serial port connected to the GNSS serial port: controlled mode. This configuration is for SiRF StarIV-based GNSS modules support only (JN3-

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$GPSD - GNSS Device Type Set	SELINT 2
	FLASH, JN3-ROM and JN3-ROM+EEPROM). 4 - serial port connected to the GNSS serial port: controlled mode. This configuration is for ST TeseoII-based GPS modules support only (SL869) 5 - serial port connected to the GNSS serial port: controlled mode. This configuration is for SiRF StarV-based GNSS modules support only (SE868-V2) **<sub_device type>** 0 - Flash device: Flash based module (default). 1 - ROM device: ROM based module. 2 - ROM + EEPROM (or SPI Flash) device: EEPROM (or SPI Flash) based module. Note: The **<sub_device type>** can be used with SiRF Star-based GNSS modules (JF2/JN3/SE868-V2) only, i.e. when **AT$GPSD=2, AT$GPSD=3 or AT$GPSD=5.** Note: the current setting is stored through **$GPSSAV**
AT$GPSD?	Read command reports the current value of **<device_type>** and **<sub_device_type>** parameters, in the format: **$GPSD: <device_type>,<sub_device_type>**
AT$GPSD=?	Test command reports the range of supported values for parameter **<device_type>,<sub_device_type>**
Example	AT$GPSD=0 OK AT$GPSD=2,1 OK AT$GPSD=4,2 ERROR

5.1.6.15.13.2. GPIO configuration for GNSS control - $GPSGPIO

$GPSGPIO – GPIO Configuration for GNSS control	SELINT 2
AT$GPSGPIO= **<on_off>,** **<system_on>,** **<boot>,** **<reset>**	Execution command sets the GPIO pins to be used to drive JF2 (SE868), JN3 (SL868), SL869, SE868-V2 and SL871 GNSS modules. Parameters: **<on_off>** - GPIO pin number to be used to drive the

$GPSGPIO – GPIO Configuration for GNSS control	**SELINT 2**
	JF2/JN3/SL869/SE868-V2's ON-OFF signal (default = 1) **<system_on>** - GPIO pin number to be used to drive the JF2/SE868-V2's SYSTEM-ON signal (default = 2) **<boot>** - GPIO pin number to be used to drive the JF2-Flash/JN3-Flash/SL869's BOOT signal (default = 3) **<reset>** - GPIO pin number to be used to drive the JF2-Flash/JN3-Flash's RESET signal (default = 4) Note: the GPIO configuration specified through this command must be coherent with the specific GNSS module that has to be used, i.e. the configuration specified through the AT$GPSD command. Therefore the GPIOs corresponding to unnecessary signals (e.g. <system_on>, <boot> and <reset> for a JN3-ROM) should be set to zero: this allows to reserve and use the minimum number of GPIOs. Note: See the Hardware User Guide to check the number of available GPIO pins. Note: the GPIO configuration correctness and functionality (i.e. possible conflicts with the GPIO configuration applied through **AT#GPIO**) are under the customer's sole responsibility. Note: if any of the V24 signals has been previously configured as GPIO through **AT#V24CFG**, it can be set by the extended GPIO range (GPIO # from 128 to 133) to drive the external GNSS receiver. Extended GPIOs and V24 signals correspondence is shown below: GPIO #128 → DCD GPIO #129 → CTS GPIO #130 → RING GPIO #131 → DSR GPIO #132 → DTR GPIO #133 → RTS See the Example section below for an example on how to set such GPIOs. An ERROR is returned whenever trying to set a GPIO, from the extended GPIO range, its corresponding V24 signal has not been previously configured as GPIO through **AT#V24CFG.** Note: the current GPIO configuration can be stored through **AT$GPSSAV**
AT$GPSGPIO?	Read command reports the currently selected configuration in the format: **$GPSGPIO: <on_off>,<system_on>,<boot>,<reset>**
AT$GPSGPIO=?	Test command reports supported range of values for parameters **<on_off>,**

$GPSGPIO – GPIO Configuration for GNSS control	**SELINT 2**
	<system_on>, <boot> and **<reset>** Note**:** the extended GPIO range is reported along with the available customer GPIO range.
Example	- For a JF2-Flash (AT$GPSD=2,0): AT$GPSGPIO=4,5,6,7 OK AT$GPSGPIO? $GPSGPIO: 4,5,6,7 OK - For a JF2-ROM (AT$GPSD=2,1): AT$GPSGPIO=4,5,0,0 OK OR AT$GPSGPIO=4,5,6,7 OK AT$GPSGPIO? $GPSGPIO: 4,5,0,0 OK - For a JF3-ROM (AT$GPSD=3,1): AT$GPSGPIO=4,0,0,0 OK OR AT$GPSGPIO=4,5,6,7 OK AT$GPSGPIO? $GPSGPIO: 4,0,0,0 OK - Set Command to configure GPIOs from extended GPIO range:

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$GPSGPIO – GPIO Configuration for GNSS control	SELINT 2
	AT$GPSGPIO=131,132,130,128 OK - Test Command showing extended GPIO range: AT$GPSGPIO=? $GPSGPIO: (1-8,128-131),(1-8,132-133),(1-8,128-131),(1-8,128-131) OK
Note	The Command is available in "Controlled Mode" only

5.1.6.15.13.3. Set the GNSS serial port speed - $GPSSERSPEED

$GPSSERSPEED – Set the GNSS serial port speed	SELINT 2
AT$GPSSERSPEED= <speed>	Execution command sets the GNSS serial port communication speed. Parameters: <speed> - 4800(default) 9600 Note: This command can be used with SIRF-based GNSS modules only, such as JF2, JN3 and SE868-V2 (AT$GPSD=2, AT$GPSD=2,1, AT$GPSD=2,2, AT$GPSD=3, AT$GPSD=3,1, AT$GPSD=3,2 or AT$GPSD=5,2). Note: the current setting is stored through $GPSSAV. Note: The module must be restarted to use the new configuration
AT$GPSSERSPEED?	Read command returns the selected serial speed in the format $GPSSERSPEED: <speed>
AT$GPSSERSPEED=?	Test command returns the available range for <speed>
Example	AT$GPSSERSPEED = 4800 OK

5.1.6.15.13.4. GPS Controller Power Management - $GPSP

$GPSP – GNSS Controller Power Management	SELINT 2
AT$GPSP=<status>	Set command allows to manage power-up or down of the GNSS controller Parameter: **<status>** 0 - GNSS controller is powered down 1 - GNSS controller is powered up
AT$GPSP?	Read command reports the current value of the **<status>** parameter, in the format: **$GPSP: <status>** For products **without** built-in GNSS receiver (see the Note section below): The <status> parameter does not report the real power status of the GNSS module but only the value set through the set command above. The <status> parameter, once stored through the AT$GPSSAV command, specifies the power status of the GNSS module (ON or OFF) at system start-up
AT$GPSP=?	Test command reports the range of supported values for parameter **<status>**
Example	AT$GPSP=0 OK
Note	For products **without** built-in GNSS receiver: The command is available in "controlled mode" only For products **with** built-in GNSS receiver: Power up clears GNSS memory and then starts the GNSS receiver. GNSS data cleaning is performed on the base of the current value of the **<reset_type>** parameter (see $GPSR) List of products **with** built-in GNSS receiver is available in the AT Commands Availability Table (for instance: HE910-G). The current setting is stored through **$GPSSAV**

5.1.6.15.13.5. GNSS Antenna LNA control - $GPSAT

$GPSAT – GNSS Antenna LNA Control	SELINT 2
AT$GPSAT= <type>	Set command selects the GNSS antenna used. Parameter: <type> 0 - Disable External GNSS Antenna LNA (default):

	GNSS chip Internal LNA Gain Mode is High and GPS_EXT_LNA_EN signal is Low 1 - Enable External GNSS Antenna LNA: GNSS chip Internal LNA Gain Mode is Low and GPS_EXT_LNA_EN signal is High Note: the current setting is stored through $GPSSAV
AT$GPSAT?	Read command returns the current value of **<type>** in the format: $GPSAT: <type>
AT$GPSAT=?	Test command reports the range of supported values for parameter **<type>**
Example	AT$GPSAT=1 OK
Note	The command is available in "controlled mode" only This command is currently available for SirfIV-based GNSS modules (JF2 and JN3) only, i.e. whenever is AT$GPSD=2 or AT$GPSD=3. This command must be issued only when the GNSS receiver is operating in Full Power Mode (see $GPSPS), otherwise it might have no effect Since the AT$GPSAT command performs a hardware reconfiguration of the GNSS receiver, the issuing of two consecutive AT$GPSAT commands should be avoided, otherwise the reconfiguration might fail: an ERROR is returned in the latter case If the **<type>** parameter has been set to 1, the External GNSS Antenna LNA is directly driven by the GNSS receiver according to its current power mode (i.e. the External GNSS Antenna LNA is turned off whenever the GNSS receiver is in power saving mode) Please refer to the HW User Guide for the compatible GNSS antennas and their usage

5.1.6.15.13.6. Save GPS Parameters Configuration - $GPSSAV

$GPSSAV – Save GPS Parameters Configuration	**SELINT 2**
AT$GPSSAV	Execution command stores the current GNSS parameters in the NVM of the cellular module.

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AT$GPSSAV=?	Test command returns the **OK** result code
Example	AT$GPSSAV OK
Note	The module must be restarted to use the new configuration

5.1.6.15.13.7. Restore To Default GPS Parameters - $GPSRST

$GPSRST – Restore To Default GPS Parameters	**SELINT 2**
AT$GPSRST	Execution command resets the GNSS parameters to "Factory Default" configuration and stores them in the NVM of the cellular modules.
AT$GPSRST=?	Test command returns the **OK** result code
Example	AT$GPSRST OK
Note	The module must be restarted to use the new configuration

5.1.6.15.14. GNSS Power Saving Modes

5.1.6.15.14.1. Set The GNSS Module In Power Saving Mode - $GPSPS

$GPSPS - Set The GNSS Module In Power Saving Mode	SELINT 2
AT$GPSPS= <mode> [,<PTF_Period>]	Set command allows setting the GNSS module in Power saving mode. Parameters: <mode> - the GNSS receiver can operate in four power modes: 0 - Full Power Mode, power saving disabled (default). Full-power mode is also known as Continuous Navigation mode. This is the most accurate navigation mode and supports the most dynamic motion scenarios. 1 - TricklePower Mode. TricklePower mode is a duty cycled mode in which the system selects a minimum rate of navigation solution updates and minimizes average current. 2 - Push-To-Fix Mode. Push-to-Fix mode (PTF) is designed for applications that require infrequent position reporting. The SiRF Star receiver generally stays in the Hibernate system power state but wakes up periodically to refresh position, time, ephemeris data and RTC calibration. A pulse on the external ON_OFF line to the receiver acts as a position update request. 3 - Micro Power Mode. Micro Power mode (MPM) is a very low power maintenance mode that delivers continuous availability of the navigation solution. It is intended for low dynamics applications. It continuously maintains ephemeris data as well as a low level of uncertainty in the estimates of position, time, and receiver clock error. It achieves this by keeping the SiRFStar receiver in the Hibernate power state and leaving Hibernate only as needed to maintain these conditions.

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$GPSPS - Set The GNSS Module In Power Saving Mode	SELINT 2
	<PTF_Period> - Push-To-Fix update period, numeric value in seconds; when mode is Push-To-Fix, the receiver turns on periodically according to this parameter (default value is 1800 sec). This parameter does have meaning only when <mode>=2. Note: Push-To-Fix and Micro Power modes support is not available for JN3 because it does not have an ON_OFF input. Therefore, when AT$GPSD=3, only Full Power and TricklePower modes are supported. In addition, in this case, the <PTF_Period> parameter is accepted but not used. Note: Micro Power Mode support is not currently available for SE868-V2.
AT$GPSPS?	Read command returns the current power saving mode and push-to-fix period, in the format: $GPSPS: <mode>,<PTF_Period>
AT$GPSPS=?	Test command returns the available range for <mode> and <PTF_Period>
Note	Available in "controlled mode" only This command is currently available for Sirf-based GNSS modules (JF2, JN3 and SE868-V2) only, i.e. whenever is AT$GPSD=2, AT$GPSD=3 or AT$GPSD=5.

5.1.6.15.14.2. Wake Up GNSS From Power Saving Mode - $GPSWK

$GPSWK - Wake Up GNSS From Power Saving Mode	SELINT 2
AT$GPSWK	Execution command allows to wake up the GNSS module when a power saving mode has been enabled. Note: if the GNSS module has been configured to work in TricklePower Mode, it will start up, get a fix and then continue to work in power saving mode. Note: if the GNSS module has been configured to work in Push-To-Fix Mode, issuing AT$GPSWK allows to wake up it before the Push-To-Fix update period; once a new fix will be got, the GNSS module will return to Push-To-Fix mode. Note: if the GNSS module has been configured to work in Micro Power Mode, it will be set to Full Power Mode (same as issuing AT$GPSPS=0

$GPSWK - Wake Up GNSS From Power Saving Mode	SELINT 2
	command).
AT$GPSWK=?	Test command returns the OK result code
Note	Available in "controlled mode" only This command is currently available for Sirf-based GNSS modules (e.g. JF2, JN3 and SE868-V2) only, i.e. whenever is AT$GPSD=2, AT$GPSD=3 or AT$GPSD=5.

5.1.6.15.15. GNSS General Managent

5.1.6.15.15.1. GNSS Software Version - $GPSSW

$GPSSW - GNSS Software Version	SELINT 2
AT$GPSSW	Execution command provides the GNSS module software version in the format: $GPSSW: <sw version>
AT$GPSSW?	Read command has the same meaning as the Execution command
AT$GPSSW=?	Test command returns the OK result code
Example	For modules with SE/SL868: AT$GPSSW $GPSSW: GSD4e_4.0.2-P1 05/26/2010 146 OK For modules with SL869: AT$GPSSW $GPSSW: SL869 v3.0.0.1 -STD -N96 OK For modules with SE868-V2: AT$GPSSW $GPSSW: 5xp__5.5.2-R32+5xpt_5.5.2-R32 OK
Note	The command is available in "controlled mode" only GNSS module software version is available in few seconds at first GNSS module startup

5.1.6.15.15.2. GPS Reset - $GPSR

$GPSR – GPS Reset	SELINT 2
AT$GPSR=<reset_type>	Execution command allows to reset the GPS controller. Parameter: **<reset_type>** 0 – Factory Reset: this option clears all GPS memory including clock drift. 1 - Coldstart (No Almanac, No Ephemeris): this option clears all data that is currently stored in the internal memory of the GPS receiver including position, almanac, ephemeris, and time. The stored clock drift however, is retained. 2 - Warmstart (No ephemeris): this option clears all initialization data in the GPS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The almanac is retained but the ephemeris is cleared. 3 - Hotstart (with stored Almanac and Ephemeris): the GPS receiver restarts by using the values stored in the internal memory of the GPS receiver; validated ephemeris and almanac.
AT$GPSR=?	Test command reports the range of supported values for parameter **<reset_type>**
Example	AT$GPSR=0 OK
Note	For products **without** built-in GNSS receiver (see note below): - The command is available in "controlled mode" only - This command must be issued only when the GNSS receiver is operating in Full Power Mode (see $GPSPS), otherwise it might have no effect - Since the Factory Reset **(<reset_type>=0)** performs a hardware reconfiguration of the GNSS receiver, the issuing of two consecutive **AT$GPSR** commands should be avoided, otherwise the reconfiguration might fail: an **ERROR** is returned in the latter case For products **with** built-in GNSS receiver (see note below): The current setting is stored through $GPSSAV List of products **with** built-in GNSS receiver is available in the AT Commands Availability Table (for instance: HE910-G).

5.1.6.15.15.3. Direct Access to GNSS Module - $GPSCON

$GPSCON - Direct Access to GNSS Module	SELINT 2
AT$GPSCON	Execution command allows setting the cellular module in transparent mode in order to have a direct access to the serial port of the GNSS module. The cellular module will directly transfer the received data to the GNSS module (and vice-versa), without checking or elaborating it. Note: the command can be used in "controlled mode" only.

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$GPSCON - Direct Access to GNSS Module	SELINT 2
	Note: in case of an incoming call from cellular module, this will be visible on the RING pin of serial port. Note: the escape sequence is "+++" The suggested Serial Port Speed for SirfIV-based modules (e.g. JF2 and JN3) is 57600. The suggested Serial Port Speed for SirfV-based modules (e.g. SE868-V2) is 115200.
AT$GPSCON=?	Test command returns the OK result code

5.1.6.15.16. GNSS Positioning Information

5.1.6.15.16.1. Unsolicited NMEA Data Configuration - $GPSNMUN

$GPSNMUN - Unsolicited NMEA Data Configuration	SELINT 2
AT$GPSNMUN= **<enable>** **[,<GGA>,<GLL>,** **<GSA>,<GSV>,** **<RMC>,<VTG>]**	Set command allows to activate an Unsolicited stream of GNSS data (in NMEA format) through the standard cellular module serial port and defines which NMEA sentences will be relayed Parameters: **<enable>** 0 - NMEA data stream de-activated (default) 1 - NMEA data stream activated with the following unsolicited response syntax: **$GPSNMUN: <NMEA SENTENCE><CR>** 2 - NMEA data stream activated with the following unsolicited response syntax: **<NMEA SENTENCE><CR>** 3 - dedicated NMEA data stream; it is not possible to send AT commands; with the escape sequence '+++' the user can return to command mode **<GGA>** - Global Positioning System Fix Data 0 - disable (default) 1 - enable **<GLL>** - Geographic Position - Latitude/Longitude 0 - disable (default) 1 - enable **<GSA>** - GNSS DOP and Active Satellites 0 - disable (default) 1 - enable

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$GPSNMUN - Unsolicited NMEA Data Configuration	**SELINT 2**
	<GSV> - GNSS Satellites in View 0 - disable (default) 1 - enable **<RMC>** - Recommended Minimum Specific GNSS Data 0 - disable (default) 1 - enable **<VTG>** - GNSS Course Over Ground and Ground Speed 0 - disable (default) 1 – enable
AT$GPSNMUN?	Read command returns whether the unsolicited GNSS NMEA data stream is currently enabled or not, along with the current NMEA mask configuration, in the format: **$GPSNMUN:<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>**
AT$GPSNMUN=?	Test command returns the supported range of values for parameters **<enable>, <GGA>, <GLL>, <GSA>, <GSV>, <RMC>, <VTG>**
Example	*Set the GSA as available sentence in the unsolicited message:* AT$GPSNMUN=2,0,0,1,0,0,0 OK *Turn-off the unsolicited mode:* AT$GPSNMUN=0 OK *Read the current NMEA mask configuration:* AT$GPSNMUN? $GPSNMUN: 2,0,0,1,0,0,0 OK *The unsolicited message will be:* $GPGSA,A,3,23,20,24,07,13,04,02,,,,,,2.4,1.6,1.8*3C
Reference	For products **without** built-in GNSS receiver (see the Note section below) NMEA 0183 Specifications
Note	For products **without** built-in GNSS receiver: *The command is available in "Controlled Mode" only*

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$GPSNMUN - Unsolicited NMEA Data Configuration	SELINT 2
	The available NMEA sentences and their talker (GN, GP and GL) depend on the GNSS receiver used and its firmware configuration. *Please refer to the Software Application Note of the GNSS receiver used for further information on the available NMEA data set.* SirfIV-based GNSS modules (e.g. JF2, JN3): *The fields PDOP and VDOP are not available* List of products **with** built-in GNSS receiver is available in the AT Commands Availability Table (for instance: HE910-G).

5.1.6.15.16.2. Get Acquired Position - $GPSACP

$GPSACP – Get Acquired Position	SELINT 2
AT$GPSACP	Execution command returns information about the last GPS position in the format: **$GPSACP: <UTC>,<latitude>,<longitude>,<hdop>,<altitude>, <fix>,<cog>,<spkm>,<spkn>,<date>,<nsat>** where: **<UTC>** - UTC time (hhmmss.sss) referred to GGA sentence **<latitude>** - format is ddmm.mmmm N/S (referred to GGA sentence) where: dd - degrees 00..90 mm.mmmm - minutes 00.0000..59.9999 N/S: North / South **<longitude>** - format is dddmm.mmmm E/W (referred to GGA sentence) where: ddd - degrees 000..180 mm.mmmm - minutes 00.0000..59.9999 E/W: East / West **<hdop>** - x.x - Horizontal Diluition of Precision (referred to GGA sentence) **<altitude>** - x.x Altitude - mean-sea-level (geoid) in meters (referred to GGA sentence) **<fix>** - 0 or 1 - Invalid Fix 2 - 2D fix 3 - 3D fix

	<cog> - ddd.mm - Course over Ground (degrees, True) (referred to VTG sentence) where: ddd - degrees 000..360 mm - minutes 00..59 **<spkm>** - x.x Speed over ground (Km/hr) (referred to VTG sentence) **<spkn>** - x.x- Speed over ground (knots) (referred to VTG sentence) **<date>** - ddmmyy Date of Fix (referred to RMC sentence) where: dd - day 01..31 mm - month 01..12 yy - year 00..99 - 2000 to 2099 **<nsat>** - nn - Total number of satellites in use (referred to GGA sentence) 00..12
AT$GPSACP?	Read command has the same meaning as the Execution command
AT$GPSACP=?	Test command returns the **OK** result code
Example	AT$GPSACP $GPSACP: 122330.000,4542.8106N,01344.2720E,2.25,338.0,3,0.0,0.02,0.01,240613,04 OK
Note	For products **without** built-in GNSS receiver: *If the GNSS receiver is turned off or its serial line is not physically connected to the cellular module, the answer might be empty as shown below.* *AT$GPSACP* *$GPSACP:* *OK* List of products **with** built-in GNSS receiver is available in the AT Commands Availability Table (for instance: HE910-G).

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5.1.6.15.17. GNSS SiRFInstantFix™

5.1.6.15.17.1. GPS SiRFInstantFix™ - $GPSIFIX

$GPSIFIX – GPS SiRFInstantFix™	SELINT 2
AT$GPSIFIX= <enable>[, <cgee>, <sgee>[, <update>]]	Set command enables/disables SiRFInstantFix™ feature available on SiRF StarIV based modules. Parameters: **<enable>** - SiRFInstantFix Usage 0 – Disable (default) 1 – Enable **<cgee>** - Client Generated Extended Ephemeris (CGEE) 0 – Disable 1 – Enable (default) **<sgee>** - Server Generated Extended Ephemeris (SGEE) 0 – Disable (default) 1 – Enable **<update>** - SGEE File Update Mode 0 – Upon Aiding Data Requests coming from GPS chip 1..168 – Update rate in hours (168 is the max update rate in case of 7-days SGEE files usage) Note: SiRFInstantFix parameters are stored in NVM, along with all current GPS parameters, if **OK** is returned (same as AT$GPSSAV) Note: if **<enable>=0,** the rest of parameters must be omitted otherwise **ERROR** is returned Note: if **<enable>=1** and the rest of parameters is omitted, the default configuration, or a previous stored one, is used Note: if **<sgee>=1**, the **<update>** parameter must be set otherwise **ERROR** is returned Note: if **<sgee>=1** the following URC is used to warn, according to the **<update>** value, that the SGEE file has to be updated: *$SIFIXEV: SGEE File Update Requested* Note: If **<sgee>=0,** the **<update>** parameter must be omitted otherwise **ERROR** is returned Note: SiRFInstantFix default configuration may be restored by

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	issuing the AT$GPSRST command
AT$GPSIFIX?	Read command reports the currently selected SiRFInstantFix configuration in the format: **$GPSIFIX: <enable>[,<cgee>,<sgee>[,<update>]]**
AT$GPSIFIX=?	Test command reports the supported range of values for parameters **<enable>, <cgee>, <sgee>,<update>**
Example	AT$GPSIFIX=0 OK AT$GPSIFIX=1,1,0 OK
Note	The Command is available in "Controlled Mode" only

5.1.6.15.17.2. GNSS SiRFInstantFix™ - $GNSSIFIX

$GNSSIFIX – GNSS SiRFInstantFix™	SELINT 2
AT$GNSSIFIX= <navsystem>, <cgee>, <sgee>	Set command enables/disables the SiRFInstantFix™ feature available on SiRF StarV-based GNSS modules. Parameters: **<navsystem>** - Constellation for which the SiRFInstantFix™ feature has to be enabled 0 – GPS 1 – GLONASS **<cgee>** - Client Generated Extended Ephemeris (CGEE) 0 – Disable 1 – Enable **<sgee>** - Server Generated Extended Ephemeris (SGEE) 0 – Disable 1 – Enable Note: SE868-V2 firmware comes with CGEE and SGEE enabled by default for both GPS and GLONASS constellations. Note: if **<sgee>=1** the following URC is used to warn, according to the **<navsystem>** value, that the SGEE file has to be updated: - For GPS

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	$SIFIXEV: GPS SGEE File Update Requested - For GLONASS *$SIFIXEV: GLONASS SGEE File Update Requested*
AT$GNSSIFIX?	Read command reports the current SiRFInstantFix™ configuration, for both GPS and GLONASS, in the format: **$GNSSIFIX: 0,<cgee>,<sgee>** **$GNSSIFIX: 1,<cgee>,<sgee>**
AT$GNSSIFIX=?	Test command reports the supported range of values for parameters **<navsystem>, <cgee>, <sgee>**
Example	AT$GNSSIFIX=0,1,0 OK AT$GNSSIFIX=1,1,1 OK
Note	The Command is available in "Controlled Mode" only

5.1.6.15.17.3. Get SGEE File for SiRFInstantFix™ - $FTPGETIFIX

$FTPGETIFIX – Get SGEE File for SiRFInstantFix™	SELINT 2
AT$FTPGETIFIX= <filename>, <filesize> [,<navsystem>]	Execution command, issued during an FTP connection, opens a data connection, downloads a SGEE file from the FTP server and injects it into SiRF StarIV or StarV GNSS receiver. Parameters: **<filename>** - file name, string type **<filesize>** - SGEE file size in bytes **<navsystem>** - Constellation for which the SGEE file has to be downloaded and injected 0 – GPS (default) 1 – GLONASS Note: whenever an FTP connection has not been opened yet, an ERROR result code is returned Note: whenever an error happens during the SGEE file injection stage, an ERROR result code is returned

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$FTPGETIFIX – Get SGEE File for SiRFInstantFix™	SELINT 2
	In this case the possible *<err>* values reported by *+CME ERROR* (numeric format followed by verbose format) may be: 920 SGEE update initialization stage failed 921 SGEE file is not newer than the last stored one 922 SGEE update generic error 923 SGEE file open error Note: The command closure should always be handled by the customer application. In order to avoid download stall situations a timeout should be implemented by the application. Note: the **<navsystem>** parameter has a meaning for Sirf StarV-based receivers (e.g. SE868-V2) only; if omitted, the default value will be used (GPS). Therefore, when a Sirf StarIV-based receiver is used, the **<navsystem>** parameter is accepted but it does not have any effect.
AT$FTPGETIFIX=?	Test command returns the **OK** result code
Example	AT$FTPGETIFIX="packedDifference.f2p3enc.ee",30970 OK AT$FTPGETIFIX="packedDifference.f2p1enc.ee",10742 +CME ERROR: SGEE file is not newer than the last stored one
Note	The Command is available in "Controlled Mode" only

5.1.6.15.17.4. Get SGEE File for SiRFInstantFix™ - $HTTPGETIFIX

$HTTPGETIFIX – Get SGEE File for SiRFInstantFix™	SELINT 2
AT$HTTPGETIFIX= **< prof_id >,** **<filesize>** **[,<navsystem>]**	Execution command, issued during an HTTP connection, downloads a SGEE file from the HTTP server and injects it into the SiRF StarIV or StarV GNSS receiver, after a HTTP query using a specific Profile Id, GET option, SGEE file name has been sent. Parameters: **<prof_id>** - Numeric parameter indicating the profile identifier. Range: 0-2 **<filesize>** - SGEE file size in bytes **<navsystem>** - Constellation for which the SGEE file has to be

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	downloaded and injected 0 – GPS (default) 1 – GLONASS Note: whenever an HTTP configuration has not been done yet, an **ERROR** result code is returned Note: whenever an error happens during the SGEE file injection stage, an **ERROR** result code is returned In this case the possible *<err>* values reported by *+CME ERROR* (numeric format followed by verbose format) may be: 920 SGEE update initialization stage failed 921 SGEE file is not newer than the last stored one 922 SGEE update generic error 923 SGEE file open error Note: the **<navsystem>** parameter has a meaning for Sirf StarV-based receivers (e.g. SE868-V2) only; if omitted, the default value will be used (GPS). Therefore, when a Sirf StarIV-based receiver is used, the **<navsystem>** parameter is accepted but it does not have any effect.
AT$HTTPGETIFIX=?	Test command returns the **OK** result code
Example	AT$HTTPGETIFIX=0,30970 OK AT$HTTPGETIFIX=0,10742 +CME ERROR: SGEE file is not newer than the last stored one
Note	The Command is available in "Controlled Mode" only

5.1.6.15.18. GNSS Patch Management

5.1.6.15.18.1. Write Patch on flash - $WPATCH

$WPATCH – Write Patch on flash	SELINT 2
AT$WPATCH=<patch_file_name>,<size>	Execution command allows storing a SiRF software patch onto the cellular module's flash memory.

$WPATCH – Write Patch on flash	SELINT 2
	The file should be sent using RAW ASCII file transfer. It is important to set properly the port settings. In particular: Flow control: hardware. Baud rate: 115200 bps Parameters: **<patch_file_name>** - name of the file in NVM, string type (max 16 chars, case sensitive). **<size>** - file size in bytes The device shall prompt a three character sequence <greater_than><greater_than><greater_than> (IRA 62, 62, 62) then the command line is terminated with a <CR>; after that a file can be sent from TE, sized <size> bytes. The operations completes when all the bytes are received. If writing ends successfully, the response is OK; otherwise an error code is reported. Note: This command can be used with SIRF ROM-based GNSS modules only (**AT$GPSD=2,1, AT$GPSD=2,2, AT$GPSD=3,1, AT$GPSD=3,2, or AT$GPSD=5,2**). Note: The patch file must have a "**.pd2**" or "**.pd3**" (AT$GPSD=5,2) extension.
AT$WPATCH=?	Test command returns the **OK** result code

Example	`AT$WPATCH = "GSD4E_4.1.2.pd2",5472`
	`>>> here receive the prompt: depending on your editor settings it's possible that the prompt overrides the above line; then type or send the patch, sized 54 bytes`
	`OK`
	
	`Patch has been stored.`

5.1.6.15.18.2. List Available Patch - $LPATCH

$LPATCH – List Available Patch	SELINT 2
AT$LPATCH	Execution command displays the available SiRF software patch saved onto the cellular module's flash memory.

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$LPATCH – List Available Patch	SELINT 2
	Note: This command can be used with SIRF ROM-based GNSS modules only (AT$GPSD=2,1, AT$GPSD=2,2, AT$GPSD=3,1, AT$GPSD=3,2 or AT$GPSD=5,2). Note: The patch file must have a ".pd2" or ".pd3" (AT$GPSD=5,2) extension.
AT$LPATCH=?	Test command returns the OK result code
Example	AT$LPATCH $LPATCH: "GSD4E_4.1.2.pd2",5472 OK

5.1.6.15.18.3. Enable Patch - $EPATCH

$EPATCH – Enable Patch	SELINT 2
AT$EPATCH=[<patch_file_name>]	Execution command allows enabling the usage of the SiRF software patch saved onto the cellular module's flash memory. Parameters: <patch_file_name> - name of the file in NVM, string type (max 16 chars, case sensitive). The execution command returns OK but the patching is confirmed by the following unsolicited: - *"Patch Manager: Patched"* Other unsolicited messages can be due to errors occurred during the patching procedure or patch storage errors: -*"Patch Manager: Error opening Patch File"* -*"Patch Manager: Error processing Patch File"* -*"Patch Manager: Error on Start Request"* -*"Patch Manager: Error on Load Request"* -*"Patch Manager: Error on Exit Request"* Note: This command can be used with SIRF ROM-based GNSS modules only (AT$GPSD=2,1, AT$GPSD=2,2, AT$GPSD=3,1, AT$GPSD=3,2 or AT$GPSD=5,2). Note: The patch file must have a ".pd2" or ".pd3" (AT$GPSD=5,2) extension. Note: A previously applied patch can be removed from the GNSS module

$EPATCH – Enable Patch	SELINT 2
	Patch RAM by issuing a Factory Reset or by powering the GNSS module down and removing the VBatt. However, if automatic patch application hasn't been disabled, the patch will be automatically reapplied. Note: If the **<patch_file_name>** is omitted, the automatic patch application, at the next startup of the cellular module, is disabled. However, the current patch remains applied until it will be not removed as explained above. Note: The configuration specified through AT$EPATCH can be saved by means of the **AT$GPSSAV** command. Note: "**AT$EPATCH**" command returns **ERROR**.
AT$EPATCH?	Read command display the patch in use in the format: **$EPATCH: <patch_file_name>**
AT$EPATCH=?	Test command returns the **OK** result code

Example	`AT$EPATCH = "GSD4E_4.1.2.pd2"`
	`OK`
	
	`Patch Manager: Patched.`
	
	`-The SiRF GNSS module has been patched`

5.1.6.15.18.4. Delete Patch - $DPATCH

$DPATCH – Delete Patch from NVM	SELINT 2
AT$DPATCH= <patch_file_name>	Execution command deletes a SiRF software patch stored onto the cellular module's flash memory. Parameters: **<patch_file_name>** - name of the file in NVM, string type (max 16 chars, case sensitive). The execution command returns OK. Note: This command can be used with SIRF ROM-based GNSS modules only (**AT$GPSD=2,1, AT$GPSD=2,2, AT$GPSD=3,1, AT$GPSD=3,2 or AT$GPSD=5,2**).

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$DPATCH – Delete Patch from NVM		SELINT 2
AT$DPATCH=?	Test command returns the OK result code	
Example	AT$DPATCH = "GSD4E_4.1.2.pd2" OK	

5.1.6.15.19. GNSS ST-AGPS™

5.1.6.15.19.1. Enable STAGPS™ Usage - $GPSSTAGPS

$GPSSTAGPS – Enable STAGPS™ Usage		SELINT 2
AT$GPSSTAGPS= <enable>	Set command enables/disables the STAGPS™ feature available on ST TESEOII-based GNSS modules. Parameters: <enable>: 0 – Disable 1 – Enable Note: This command can be used with ST TESEOII-based GNSS modules only (**AT$GPSD=4**). Note: Since the current STAGPS™ configuration is not saved in NVM this command has to be issued at every power-cycle of both the GNSS receiver and the cellular module.	
AT$GPSSTAGPS?	Read command reports the currently selected STAGPS™ configuration in the format: $GPSSTAGPS: <enable>	
AT$GPSSTAGPS=?	Test command reports the supported range of values for parameter <enable>	

5.1.6.15.19.2. Get ST-AGPS seed file for ST-AGPS™ - $HTTPGETSTSEED

$HTTPGETSTSEED – Get ST-AGPS seed file for ST-AGPS™		SELINT 2
AT$HTTPGETSTSEED= <prof_id>,	Execution command, issued during a HTTP connection, downloads a ST-AGPS seed file from the HTTP server and creates a decoded	

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<filesize>	version of the file itself. The decoded seed file, is stored onto the module's NVM and can be injected later on by means of the AT$INJECTSTSEED command. The ST-AGPS seed file size must be retrieved, before issuing the AT$HTTPGETSTSEED command, by sending a HTTP query using a specific Profile Id, GET option and the ST-AGPS seed file name. Parameters: <prof_id> - Numeric parameter indicating the profile identifier. Range: 0-2 <filesize> - ST-AGPS seed file size in bytes Note: whenever an HTTP configuration has not been done yet, an ERROR result code is returned
AT$HTTPGETSTSEED=?	Test command returns the OK result code
Example	AT$HTTPGETSTSEED=0,2199 OK

5.1.6.15.19.3. Inject decoded ST-AGPS seed file - $INJECTSTSEED

$INJECTSTSEED – Inject decoded ST-AGPS seed file	SELINT 2
AT$INJECTSTSEED	Execution command injects a decoded ST-AGPS seed, previously downloaded and stored onto the module's NVM, into TESEOII-based GNSS receivers. Note: whenever an error happens during the decoded ST-AGPS seed file injection stage, an ERROR result code is returned In this case the possible <err> values reported by +CME ERROR (numeric format followed by verbose format) may be: 970 STAGPS Seed file open error 971 STAGPS Seed file exceeds the maximum allowed one 972 STAGPS pre-configuration error 973 STAGPS seed injection error 974 STAGPS re-configuration error Note: a decoded ST-AGPS seed can be injected only if the GNSS receiver has a valid UTC time from a previous fix, i.e. it is in a warm start condition.

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AT$INJECTSTSEED=?	Test command returns the OK result code
Note	The command is available in "Controlled Mode" only

5.1.6.16. Audio Commands

5.1.6.16.1. Audio Basic configuration

5.1.6.16.1.1. Change Audio Path - #CAP

#CAP - Change Audio Path	**SELINT2**
AT#CAP=[<n>]	It has no effect and is included only for backward compatibility. Parameter: <**n**>: (0-2)
AT#CAP?	Read command reports the set value of the parameter <**n**> in the format: **#CAP:** <**n**>.
AT#CAP=?	Test command reports the supported values for the parameter <**n**>.

5.1.6.16.1.2. Select Ringer Sound - #SRS

#SRS - Select Ringer Sound	**SELINT 2**
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 timer in units of 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

#SRS - Select Ringer Sound	SELINT 2
	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 for <**tout**> seconds. Note: if both <**n**> and <**tout**> are **0** then the default ringing tone is set as current and ringing is stopped. Note: If all parameters are omitted then the behaviour of Set command is the same as Read command
AT#SRS?	Read command reports current selected ringing and its status in the form: **#SRS:** <**n**>,<**status**> where: <**n**> - ringing tone number 1..*max* <**status**> - ringing status 0 - selected but not playing 1 - currently playing
AT#SRS=?	Test command reports the supported values for the parameters <**n**> and <**tout**>

5.1.6.16.1.3. Select Ringer Path - #SRP

#SRP - Select Ringer Path	SELINT 2
AT#SRP=[<n>]	It has no effect and is included only for backward compatibility. Parameter: <**n**>: (0-3)
AT#SRP?	Read command reports the set value of the parameter <**n**> 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

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5.1.6.16.1.4. Handsfree Microphone Gain - #HFMICG

#HFMICG - Handsfree Microphone Gain	SELINT 2
AT#HFMICG= [<level>]	It has no effect and is included only for backward compatibility. Parameter: **<level>**: 0..7 - (factory default = 4)
AT#HFMICG?	Read command returns the current set value for parameter **<level>**, in the format: **#HFMICG: <level>**
AT#HFMICG=?	Test command returns the supported range of values of parameter **<level>**.

5.1.6.16.1.5. Handset Microphone Gain - #HSMICG

#HSMICG - Handset Microphone Gain	SELINT 2
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 = 0 for HE910 and UL865 products; factory default = 4 for UE910 products)
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>**.

5.1.6.16.1.6. Handsfree Receiver Gain - #HFRECG

#HFRECG - Handsfree Receiver Gain	SELINT 2
AT#HFRECG= <level>	It has no effect and is included only for backward compatibility. Parameter: **<level>**: 0..6 - (factory default = 0) *Note: This parameter is saved in NVM issuing AT&W command.*
AT#HFRECG?	Read command returns the current value of parameter **<level>**, in the format: **#HFRECG: <level>**
AT#HFRECG =?	Test command returns the supported range of values of parameter **<level>**.

5.1.6.16.1.7. Handset Receiver Gain - #HSRECG

#HSRECG - Handset Receiver Gain	SELINT 2

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AT#HSRECG= <level>	Set command sets the handset analogue output gain Parameter: **<level>**: handset analogue output gain 0..6 - handset analogue output (-3dB/step, default value = 0) *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>**.

5.1.6.16.1.8. Set Handsfree Sidetone - #SHFSD

#SHFSD - Set Handsfree Sidetone	**SELINT 2**
AT#SHFSD= [<mode>]	It has no effect and is included only for backward compatibility. Parameter: **<mode>** (0,1) - (factory default is 0) Note: This setting returns to default after power off.
AT#SHFSD?	Read command reports the value of parameter **<mode>**, in the format: **#SHFSD: <mode>**
AT#SHFSD=?	Test command returns the supported range of values of parameter **<mode>**.

5.1.6.16.1.9. Set Handset Sidetone - #SHSSD

#SHSSD - Set Handset Sidetone	**SELINT 2**
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>**.

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5.1.6.16.1.10. Speaker Mute Control - #SPKMUT

#SPKMUT - Speaker Mute Control		SELINT 2
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.	

5.1.6.16.1.11. Analog Microphone Gain - #ANAMICG

#ANAMICG – Analog Microphone Gain		SELINT 2
AT#ANAMICG=<gain_level>	This command allows setting the microphone analog gain through 15 levels by 3 dB steps Parameters: **<gain_level>:** analog microphone gain 0..14 - analog microphone input gain (+3dB/step, factory default = 5)	
AT#ANAMICG?	Read command returns the current analog microphone gain level, in the format: **#ANAMICG: <gain_level>**	
AT#ANAMICG =?	Test command reports the supported range of values for parameters **<gain_level>**.	

5.1.6.16.1.12. Digital Microphone Gain - #DIGMICG

#DIGMICG – Digital Microphone Gain		SELINT 2
AT#DIGMICG=<gain_level>	This command allows setting the microphone digital gain through 46 levels by 1 dB steps Parameters: **<gain_level>:** digital microphone input gain	

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	0..45 - digital microphone input gain (+1dB/step, factory default = 24) NOTE: This command substitutes the #HSMICG command and has the same default values.
AT#DIGMICG?	Read command returns the current digital microphone gain level, in the format: **#DIGMICG: <gain_level>**
AT#DIGMICG =?	Test command reports the supported range of values for parameters **<gain_level>**.

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5.1.6.16.1.13. Echo Reducer Configuration - #ECHOCFG

#ECHOCFG – Echo Reducer Configuration	SELINT 2
AT#ECHOCFG=<par_1>[,<par_2>[,…,<par_N>]]	Set command writes values in echo reducer parameters. It is not allowed if active audio profile is 0. The module responds to the set command with the prompt '>' and waits for the data to send. Parameters: **<par_1>** 0 – configure all parameters, module awaits 39 values 1,2,..,39 – configure single parameters, module awaits 1 value **<par_i>** with i = {2;N} 1,2,..,39 – configure every parameter specified After '>' 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 with 4 digits for every **<par_i>** value provided by set command. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. 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. Note: Configuring single parameters, it is allowed to enter a maximum of 32 parameters. Note: the default configuration is targeted for almost all common acoustic echo scenarios; if further tuning is needed the customer can change by oneself only the following parameters: **<par_14>** 0..32767 - factory default value is 18384 Additional gain: increasing this parameter average echoes are more attenuated **<par_15>** 0..16384 - factory default value is 2000 Total gain lower limit: increasing this parameter small echoes are more attenuated **<par_16>**

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	0..16384 - factory default value is 10000 Total gain upper limit: increasing this parameter load echoes are more attenuated **<par_32>** 0..32767 - factory default value is 6000 NR Attenuation factor: decreasing this parameter increases allowed attenuation **<par_33>** 0..32767 - factory default value is 8000 Overestimation factor 0: decreasing this parameter increases noise reduction and decreases speech quality below 500Hz **<par_34>** 0..32767 - factory default value is 8000 Overestimation factor 1: decreasing this parameter increases noise reduction and decreases speech quality above 500Hz The remaining parameters could be changed but under the supervision of Telit Technical Support.
AT#ECHOCFG?	Read command reports the currently set parameters in the format: **#ECHOCFG: <par_1><par2>…<parN>** **<par_i>:** Full set of registers values dumped in hexadecimal form, 39 words (156 characters). It is not allowed if active audio profile is 0.
AT#ECHOCFG=?	Test command reports supported range of values for all parameters in the format: **#ECHOCFG: <i>, (<low_i>-<high_i>)** Where **<i>:** Parameter index **<low_i>:** Lower limit of **<par_i>** **<high_i>:** High limit of **<par_i>**

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5.1.6.16.2. Tones configuration

5.1.6.16.2.1. Signaling Tones Mode - #STM

#STM - Signaling Tones Mode	SELINT 2
AT#STM=[<mode>]	Set command enables/disables the signaling tones output on the audio path Parameter: **<mode>** - signaling tones status 0 - signaling tones disabled 1 - signaling tones enabled 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>**.

5.1.6.16.2.2. Tone Playback - #TONE

#TONE - Tone Playback	SELINT 2
AT#TONE=<tone>[,<duration>]	Execution command allows the reproduction of DTMF tones, standard free tone, standard busy tone and a set of user defined tones for a certain time. Parameters: **<tone>** - ASCII characters, range is **((0-9),#,*,(A-D),(G-L),Y,Z)**; - (0-9), #,*,(A-D): DTMF tone - (G-L): User Defined Tones - Y: free tone - Z: busy tone **<duration>** - Duration of current tone in 1/10 of Sec. 1..300 - tenth of seconds (default is 30)
AT#TONE=?	Test command returns the supported range of values for parameters **<tone>** and **<duration>**.
Note:	See AT#UDTSET command to set user defined tones

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5.1.6.16.2.3. Extended tone generation - #TONEEXT

#TONEEXT – Extended tone generation	SELINT 2
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 [10]. - 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>.**

5.1.6.16.2.4. Tone Classes Volume - #TSVOL

#TSVOL – Tone Classes Volume	SELINT 2
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 - signalling tones 16 - DTMF tones 32 - SIM Toolkit tones 64 - user defined tones 128 – Dial tones 255 - all classes **<mode>** - it indicates which volume is used for the classes of tones represented by **<class>** 0 - default volume is used 1 - the volume **<volume>** is used **<volume>** - volume to be applied to the set of classes of tones represented by

[10] See also AT#UDTSET, AT#UDTRST and AT#UDTSAV command description following in this document.

#TSVOL – Tone Classes Volume	**SELINT 2**
	<class>; it is mandatory if **<mode>** is **1**. 0..*max* - the value of *max* can be read issuing the Test command **AT#TSVOL=?** Note: The class DTMF Tones **(<class>**=16) refers only to the volume for locally generated DTMF tones. It doesn't affect the level of the DTMF generated by the network as result of AT+VTS command
AT#TSVOL?	Read command returns for each class of tones the last setting of **<mode>** and, if **<mode>** is not **0**, of **<volume>** too, in the format: **#TSVOL: 1,<mode1>[,<volume1>]<CR><LF>** **…** **#TSVOL:128,<mode128>[,<volume128>]**
AT#TSVOL=?	Test command returns the supported range of values of parameters **<class>**, **<mode>** and **<volume>**.
Example	AT#TSVOL=64,1,5 OK AT#TSVOL? #TSVOL:1,0 #TSVOL:2,0 #TSVOL:4,1,5 #TSVOL:8,0 #TSVOL:16,1,5 #TSVOL:32,0 #TSVOL:64,1,5 #TSVOL:128,0 OK

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5.1.6.16.2.5. User Defined Tone SET - #UDTSET command

#UDTSET – User Defined Tone SET	**SELINT 2**
AT#UDTSET= <tone> ,<F1>,<A1> [,<F2>,<A2> [,<F3>,<A3>]]	Set command sets a tone identified by the index **<tone>** as the sum of 3 independent frequencies **<Fi>** and amplitudes **<Ai>**. Parameters: **<tone>** - tone index (G,H,I,J,K,L) **<Fi>** - frequency in Hz; range is (300,3000) in step of 1 Hz **<Ai>** - amplitude in dB; range is (10,100) in step of 1 dB Note: Ai = 100 is equal to the max value of the single tone. Lower values attenuate output to the difference between 100 and the selected amplitude (ex: Ai = 80 is equal to 100-80 = -20dB). Note: issuing AT&F1 or AT&Z has the effect to set the parameters with the last saved in NVM values Note: Ai = 0 and Fi = 0 are only values for uninitialized parameters and can't be issued by AT command. Every time the set command is issued, the unspecified parameters are automatically reset to zero. (Ai,Fi) issuing needs also (Aj,Fj) with j<i.
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 **<tone>, <Fi>** and **<Ai>** parameters.

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5.1.6.16.2.6. User Defined Tone SAVE - #UDTSAV command

#UDTSAV – User Defined Tone SAVe	SELINT 2
AT#UDTSAV	Execution command saves the actual values of frequency and amplitude parameters that have been set with the command **#UDTSET**
AT#UDTSAV =?	Test command returns the OK result code.
Example	AT#UDTSAV OK Current tones are saved in NVM

5.1.6.16.2.7. User Defined Tone Reset - #UDTRST command

#UDTRST – User Defined Tone ReSeT	SELINT 2
AT#UDTRST	Execution command resets to the default set the actual values of frequency and amplitude parameters that can be set with the command **#UDTSET**.
AT#UDTRST =?	Test command returns the OK result code.
Example	AT#UDRST OK The default value tones are restored in NVM

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5.1.6.16.3. Audio profiles

5.1.6.16.3.1. Audio Profile Factory Configuration - #PRST

#PRST - Audio Profile Factory Configuration	SELINT 2
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*

5.1.6.16.3.2. Audio Profile Configuration Save - #PSAV

#PSAV - Audio Profile Configuration Save	SELINT 2
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*

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5.1.6.16.3.3. Audio Profile Selection - #PSEL

#PSEL - Audio Profile Selection		SELINT 2
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>**.	

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5.1.6.16.4. Audio Filters

5.1.6.16.4.1. Uplink Path Biquad Filters - #BIQUADIN

#BIQUADIN - Uplink Path Biquad Filters	SELINT 2
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: $$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ $$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ -32768..32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15) Note: in the above formulas pay attention to the multiplier (2) for parameters **<a_{F1}>**, **<a_{S1}>**, **<b_{F1}>** and **<b_{S1}>** 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}>**

5.1.6.16.4.2. Extended Uplink Biquad Filters - #BIQUADINEX

#BIQUADINEX – Extended Uplink Biquad Filters	**SELINT 2**
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: $$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ $$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ -32768..32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15) Note: in the above formulas pay attention to the multiplier (2) for parameters **<a_{F1}>**, **<a_{S1}>**, **<b_{F1}>** and **<b_{S1}>** 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}>**

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5.1.6.16.4.3. Cascaded filters - #BIQUADOUT

#BIQUADOUT - Downlink Path Biquad Filters	**SELINT 2**
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: $$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ $$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ -32768..32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15) Note: in the above formulas pay attention to the multiplier (2) for parameters **<a_{F1}>, <a_{S1}>, <b_{F1}>** and **<b_{S1}>** 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}>**

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5.1.6.16.4.4. Extended Downlink Biquad Filters - #BIQUADOUTEX

#BIQUADOUTEX – Extended Downlink Biquad Filters	SELINT 2
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: $$H_F(z) = \frac{a_{F0} + 2 \cdot a_{F1} \cdot z^{-1} + a_{F2} \cdot z^{-2}}{1 + 2 \cdot b_{F1} \cdot z^{-1} + b_{F2} \cdot z^{-2}}$$ $$H_S(z) = \frac{a_{S0} + 2 \cdot a_{S1} \cdot z^{-1} + a_{S2} \cdot z^{-2}}{1 + 2 \cdot b_{S1} \cdot z^{-1} + b_{S2} \cdot z^{-2}}$$ -32768..32767 - each value has to be interpreted as signed fixed point number in two's complement format with 15 fractional bits in a 16 bit word (Q15) Note: in the above formulas pay attention to the multiplier (2) for parameters **<a_{F1}>**, **<a_{S1}>**, **<b_{F1}>** and **<b_{S1}>** 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#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}>**

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5.1.6.16.5. Echo canceller configuration

5.1.6.16.5.1. Handsfree Echo Canceller - #SHFEC

#SHFEC - Handsfree Echo Canceller	SELINT 2
AT#SHFEC= [<mode>]	It has no effect and is included only for backward compatibility. Parameter: **<mode>** (0,1) - (0 is factory default) Note: This setting returns to default after power off.
AT#SHFEC?	Read command reports the value of parameter **<mode>**, in the format: **#SHFEC: <mode>**
AT#SHFEC=?	Test command returns the supported range of values of parameter **<mode>**.

5.1.6.16.5.2. Handset Echo Canceller - #SHSEC

#SHSEC - Handset Echo Canceller	SELINT 2
AT#SHSEC = <mode>	Set command enables/disables the echo canceller function on audio handset output. Parameter: **<mode>** 0 - disables echo canceller for handset mode (default) 1 - enables echo canceller for handset mode *Note: This parameter is saved in NVM issuing AT&W command.*
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>**.

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5.1.6.16.5.3. Handsfree Automatic Gain Control - #SHFAGC

#SHFAGC - Handsfree Automatic Gain Control	SELINT 2
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 the value of parameter **<mode>**, in the format: **#SHFAGC: <mode>**
AT# SHFAGC =?	Test command returns the supported range of values of parameter **<mode>**.

5.1.6.16.5.4. Handset Automatic Gain Control - #SHSAGC

#SHSAGC - Handset Automatic Gain Control	SELINT 2
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 (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>**.

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5.1.6.16.5.5. Handsfree Noise Reduction - #SHFNR

#SHFNR - Handsfree Noise Reduction	SELINT 2
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 the value of parameter **<mode>** , in the format: **#SHFNR: <mode>**
AT#SHFNR =?	Test command returns the supported range of values of parameter **<mode>**.

5.1.6.16.5.6. Handset Noise Reduction - #SHSNR

#SHSNR - Handset Noise Reduction	SELINT 2
AT# SHSNR = <mode>	Set command enables/disables the noise reduction function on audio handset input. Parameter: **<mode>** 0 - disables noise reduction for handset mode (default) 1 - enables noise reduction for handset mode *Note: This parameter is saved in NVM issuing AT&W command.*
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>**.

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5.1.6.16.6. Embedded DTMF decoder

5.1.6.16.6.1. Embedded DTMF decoder enabling - #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.

5.1.6.16.6.2. Embedded DTMF decoder configuration - #DTMFCFG

DTMFCFG – Embedded DTMF decoder configuration	SELINT 2
AT#DTMFCFG=<scaling>,<threshold_1>,<threshold_2>[,<std_twist>,<rev_twist>]	Set command allows configuration of the embedded DTMF decoder. Parameters: <scaling>: 3..11 – this is the scaling applied to the pcm samples in order to manage arithmetic operations. The default value is 7. <threshold_1>:

	1000..20000 – this is the numeric threshold used to detect DTMF tones. The default value is 2500. **<threshold_2>:** 1000..20000 – this is the numeric threshold used to start DTMF decoding. The default value is 1500. **<std_twist>:** 0..20 – standard twist threshold. It is an optional parameter and the default value is 9. **<rev_twist >:** 0..20 – reverse twist threshold. It is an optional parameter and the default value is 5. **Note: The default values were chosen after a fine tuning, so every change should be done very carefully to avoid wrong decoding.** Note: the values set by command are not saved and a software or hardware reset restores the default value. Note: Default values are referred to standard DMTF decoder (AT#DTMF=1). Note: It is supposed that the module is just powered on and the AT#DTMFCFG command is entered without < std_twist> and <rev_twist> parameters. In this case the read command doesn't return the setting of the <std_twist> and <rev_twist> in order to meet retro compatibility with other families. Now, let's assume that AT#DTMFCFG command is entered again, but using the < std_twist> and <rev_twist> parameters for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the <std_twist> and <rev_twist> are omitted, the read command reports the parameter value entered the last time.
AT#DTMFCFG?	Read command reports the currently selected value in the format: **# DTMFCFG:** **<scaling>,<threshold_1>,<threshold_2>[,<std_twist>[,<rev_twist >]]**
AT#DTMFCFG =?	Test command reports supported range of values for all parameters.

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5.1.6.16.7. Digital Voice Interface

5.1.6.16.7.1. Digital Voiceband Interface - #DVI

#DVI - Digital Voiceband Interface	**SELINT 2**
AT#DVI=<mode> [,<dviport>, <clockmode>]	Set command enables/disables the Digital Voiceband Interface. Parameters: **<mode>** - enables/disables the DVI. 0 - disable DVI; (factory default for UE910 product series) 1 - enable DVI; audio is forwarded to the DVI block (factory default for HE910 and UL865 product series) 2 - reserved **<dviport>** 2 - DVI port 2 will be used. **<clockmode>** 0 - DVI slave 1 - DVI master (factory default) NOTE: for further information see "HE910 Digital Voice Interface Application Note"
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 is configured as master providing on DVI Port #2 (the only available)*

5.1.6.16.7.2. Extended Digital Voiceband Interface - #DVIEXT

#DVIEXT - Digital Voiceband Interface Extension	SELINT 2
AT#DVIEXT=<config>,[<samplerate>,[<samplewidth>,[<audiomode>,>,[<edge>]]]]	Set command configures the Digital Voiceband Interface. Parameters: **<config>** 0 – Burst Mode 1 – Normal Mode (factory default) **<samplerate>** 0 – audio scheduler sample rate 8KHz (factory default) 1 - audio scheduler sample rate 16KHz **<samplewidth>** 0 – 16 bits per sample (factory default) 1 – 18 bits per sample 2 – 20 bits per sample 3 – 24 bits per sample 4 – 32 bits per sample **<audiomode>** 0 – Mono Mode 1 – Dual Mono (factory default) **<edge>** 0 – data bit is transmitted on falling edge of clock and sampled on rising edge of clock (factory default) 1 – data bit is transmitted on rising edge of clock and sampled on falling edge of clock Note: <edge> parameters is valid only in Burst Mode, in Normal Mode shall be 0.
AT#DVIEXT?	Read command reports last setting, in the format: **#DVIEXT: <config>,<samplerate>,< samplewidth >,<audiomode>, <edge>**
AT#DVIEXT=?	Test command reports the range of supported values for parameters: **<config>,<samplerate>,< samplewidth >,<audiomode>,<edge>**
Example	

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5.1.6.16.8. DVI Clock Activation - #DVICLK

#DVICLK – DVI Clock Activation	SELINT 2
AT#DVICLK=<clk>	Set command configures and activates the DVICLK clock signal. Parameters: **<clk>** 0 – Disable (factory default) 1 – DVI Clock activated at 256KHz 2 – DVI Clock activated at 384KHz 3 – DVI Clock activated at 512KHz Note: the commands #DVI, #DVIEXT, #OAP can turn off the DVICLK signal or change its frequency. Note: after setting the DVICLK frequency through #DVICLK command, a voice call does not modify the DVICLK setting.
AT#DVICLK?	Read command reports last setting, in the format: **#DVICLK: <clk>**
AT#DVICLK=?	Test command reports the range of parameter **<clk>**

5.1.6.16.9. Audio file and stream management commands

5.1.6.16.9.1. PCM Play and Receive - #SPCM

#SPCM - PCM Play And Receive	SELINT 2
AT#SPCM=<mode>, <dir>[,<format>]	Set command allows user either to send speech sample coming from microphone or downlink audio channel to serial port in PCM format, or to play a PCM stream coming from serial port to speaker or uplink audio channel. As showed in the table below if **<mode>** = 3 and **<dir>** = 1 then the speech coming from serial port with selected PCM **<format>** is sent to uplink and, at the same time, the speech coming from downlink is sent to serial port with selected PCM **<format>.** An active speech call is needed when sending/receiving to/from audio channel. Parameters: **<mode>:** action to be execute; 1 - play PCM stream from serial to selected direction **<dir>**. 2 - send speech from selected direction **<dir>** to serial. 3 - send/receive speech to/from selected direction **<dir>** **<dir>:** Select the audio path. 0 - send/receive to/from audio front end

<table>
<tr><td>#SPCM - PCM Play And Receive</td><td>SELINT 2</td></tr>
<tr><td></td><td>1 - send/receive to/from audio channel
2 - reserved

< format >: PCM bits format
0 - 8 bit (factory default)
1 - 16 bit

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: Using 16 bit 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:

<table>
<tr><th></th><th>mode = 1</th><th>mode = 2</th><th>mode = 3</th></tr>
<tr><td>dir = 0</td><td>Uplink off / Downlink on
PCM stream on speaker</td><td>Uplink off / Downlink off
PCM stream from microphone</td><td>Not supported</td></tr>
<tr><td>dir = 1</td><td>Uplink on / Downlink off
PCM stream on Uplink</td><td>Uplink off / Downlink on
PCM stream from Downlink</td><td>Uplink on / Downlink on
PCM stream to/from Uplink/Downlink</td></tr>
</table>

Sidetone is active for default.

Note: When DTMF decoder is enabled, PCM playing and recording are automatically disabled (AT#SPCM will return error).</td></tr>
<tr><td>AT#SPCM=?</td><td>Test command returns the supported range of values for parameters <mode>, <dir> and <format>.

#SPCM: <mode>,<dir>,<format></td></tr>
<tr><td>Example</td><td>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</td></tr>
</table>

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#SPCM - PCM Play And Receive	SELINT 2
	Note: after the CONNECT, 8Khz 8bit PCM stream can be read from serial port

5.1.6.16.9.2. Audio available size - #ASIZE

#ASIZE – Audio available size	SELINT 2
AT#ASIZE	This command shows residual space in bytes available to store audio files. The response format is: #ASIZE: <total size>,<used size>,<free size> Note: Some configuration files are stored in file system and with empty storage the <used_size> could be not zero. Moreover the file size on storage could differ from actual size due to block allocation.
AT#ASIZE=?	Test command returns the OK result code

5.1.6.16.9.3. List audio file - #ALIST

#ALIST – List audio file	SELINT 2
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 a file is in use, CRC16 can't be calculated and execution command does not report <crc> for that file. Note: CRC calculation time depends on file size.
AT#ALIST=?	Test command returns the OK result code

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5.1.6.16.9.4. Delete audio file - #ADELF

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

5.1.6.16.9.5. Delete all audio files - #ADELA

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

5.1.6.16.9.6. Send an audio file - #ASEND

#ASEND – Send an audio file	SELINT 2
AT#ASEND= <filename>,<filesize>	This command allows user to send an audio file to serial port and store it in the modem file system. It's mandatory to specify the file extension and it's necessary to write file name between a couple of double inverted commas. Parameters: <**filename**> - file name, string type <**filesize**> - file size in bytes When the sending is stopped or an error occurs, an URC is provided with the following format: **#ASENDEV: <result>** Where: <**result**> 0 – file storing done 1 – file storing error Note: in case Storing is completed or an error occurs, URC is received. Note: .wav and .pcm extensions are currently supported.

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#ASEND – Send an audio file	SELINT 2
	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 Filename has a maximum of 16 characters excluding double inverted commas Note: 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. Hardware flow control.
AT#ASEND=?	Test command returns the OK result code
Example	AT#ASEND="test.pcm",159182 CONNECT OK #ASENDEV: 0 Note: after the CONNECT, an audio file of 159182 bytes has to be sent to serial port.

5.1.6.16.9.7. Receive an audio file - #ARECV

#ARECV – Receive an audio file	SELINT 2
AT#ARECV=<filename>	This command allows user to receive an audio file stored in the modem file system. It's mandatory to specify the file extension and it's necessary to write file name between a couple of double inverted commas. Parameters: **<filename>** - file name, string type with .pcm or .wav extension Note: The file should be sent using RAW ASCII file transfer. Hardware flow control.
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 Note: .wav and .pcm extensions are currently supported.

5.1.6.16.9.8. Record an audio file - #ARECD

#ARECD – Record an audio file	SELINT 2
AT#ARECD=	This command records speech data coming from microphone in the

#ARECD – Record an audio file	**SELINT 2**
<mode>[,<filename>]	modem file system with an audio file format. It's mandatory to specify the file extension and it's necessary to write file name between a couple of double inverted commas. Parameter: **<mode>** 0 - stop to record , Optional parameter is not allowed (default value) 1 - start to record, Optional parameter is mandatory **<filename>** - file name, string type with .pcm or .wav extension When the recording is stopped or an error occurs, an URC is provided with the following format: **#ARECDEV: <result>** Where: **<result>** 0 – file record done 1 – file record error Note: Feature supported only in idle mode Note: Filename has a maximum of 16 characters excluding double inverted commas. Note: The total size of all audio files must not be over <total size> in #ASIZE Note: Below 200 Kb of free space the file system could stop the recording and no more recordings are allowed. Note: .wav and .pcm extensions are currently supported.
AT#ARECD?	Read command reports the currently selected **<mode>** in the format: **#ARECD: <mode>**
AT#ARECD=?	Test command reports the supported range of values for the parameters **<mode>** in the format: **#ARECD: (0,1)**
Example	AT# ARECD =1,"rec.pcm" OK AT# ARECD =0 OK #ARECDEV: 0

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5.1.6.16.9.9. Configure audio file format - #ACONF

#ACONF – Configure audio file format	SELINT 2
AT# ACONF [=<filename>]	This command configures the compression format which is used when recording a wave audio file. Compression in PCM file format is not supported. Parameters: <**format**> 0 - Linear(default) 1 - A-law 2 - U-law Note: AT#ACONF command without prameters, restores the default value
AT#ACONF?	Read command reports the currently <**format**> in the format: **#ACONF: <format>**
AT#ACONF=?	Test command reports the supported range of values for the parameters <**format**> in the format: **#ACONF: (0-2)**

5.1.6.16.9.10. Play an audio file - #APLAY

#APLAY – Play an audio file	SELINT 2
AT#APLAY= <mode>[,<dir>,<filename>]	This command plays audio file on the speaker or uplink path. It's mandatory to specify the file extension and it's necessary to write file name between a couple of double inverted commas. 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:

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#APLAY – Play an audio file		SELINT 2
	#APLAYEV: <result> Where: **<result>** 0 – file play done 1 – file play error Note: Feature supported only in idle mode Note: The format of mono audio file is 8k samples/sec and 16 bits/sample. Note: '.wav' and '.pcm' file formats are supported.	
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: **#APLAY: (0,1),(0,1)**	
Example	AT#APLAY = 1,0,"rec.pcm" OK #APLAYEV: 0	

5.1.6.16.10. Miscellaneous audio commands

5.1.6.16.10.1. TeleType Writer - #TTY

#TTY - TeleType Writer		SELINT 2
AT#TTY=<support>	Set command enables/disables the TTY functionality. Parameter: **<support>** 0 - disable TTY functionality (factory default) 1 - enable TTY functionality Note: the value set by command is directly stored in NVM and doesn't depend on the specific AT instance.	
AT#TTY?	Read command returns whether the TTY functionality is currently enabled or not, in the format: **#TTY: <support>**	

AT#TTY=?	Test command reports the supported range of values for parameter <**support**>.

5.1.6.16.10.2. Open Audio Loop - #OAP

#OAP - Open Audio Loop	**SELINT 2**
AT#OAP=[<mode>]	Set command sets Open Audio Path. Parameter: 0 - disables Open Audio Path (default) 1 - enables Open Audio Path
AT#OAP?	Read command reports whether the Open Audio Path is currently enabled or not, in the format: **#OAP: <mode>**
AT#OAP=?	Test command returns the supported range of values of parameter <**mode**>.
Note	The audio loop will be established between microphone and speaker using sidetone scaling value.

5.1.6.17. Jammed Detection & Report AT Commands

5.1.6.17.1. Jammed Detect & Report - #JDR

This command is obsolete, please refer to the next #JDRENH2.

5.1.6.17.2. Enhanced Jammed Detect & Report 2 - #JDRENH2

#JDRENH2 – Enhanced Jammed Detect & Report 2	SELINT 2
AT#JDRENH2=<mode>[,<SAT2G>,<SAT3G>,<CARRNUM>,<P_RxLev_T2G>,<P_EcN0_T3G>,<P_RSCP_T3G>[,<spare>[,<spare>[,<spare>[,<spare>]]]]]	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. 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. 5 - enables the Jammed Detect; the MODULE will make both the actions as for <**mode**>=**1** and <**mode**>=**4**.

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#JDRENH2 – Enhanced Jammed Detect & Report 2	SELINT 2
	6 - enables the Jammed Detect (this value is available only for 10.00.xxx release); 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 NOTICE: if you change the **<mode>** parameter of the AT#JDRENH2 command, it will be automatically changed the **<mode>** parameter of the AT#JDR command, without notice. - Set the starting absolute threshold of RxLevel 2G Network. After a frequency scan in 2G bands, if the power measured of a carrier is above of <SAT2G> that carrier is counted as possible jammed carrier. 0...63 (Factory default is 45). <SAT3G> - Set the starting absolute threshold of RSSI 3G Network. After a frequency scan in 3G bands, if the power measured of a carrier is above of <SAT3G> that carrier is counted as possible jammed carrier. 0...63 (Factory default is 35). <CARRNUM> - Set the minimum number of possible jammed carriers to consider that the module is under jamming condition. 0...200 (Factory default is 100). <P_RxLev_T2G> - Set the threshold of RxLev in 2G Network. The threshold (RxLev_Thr) is calculated as RxLev_Thr=RxLev_Av*(1+(<P_RxLev_T2G>/100)) where RxLev_Av is the average of the last 10 RxLev measures. 0...100 (Factory default is 15). <P_EcN0_T3G> - Set the threshold of EcN0 in 3G Network. The threshold (EcN0_Thr) is calculated as EcN0_Thr= EcN0_Av*(1-(<P_EcN0_T3G>/100)) where EcN0_Av is the average of the last 10 EcN0 measures. 0...100 (Factory default is 70). <P_RSCP_T3G> - Set the threshold of RSCP in 3G Network. The threshold (RSCP_Thr) is calculated as RSCP_Thr= RSCP_Av*(1-(<P_RSCP_T3G>/100)) where RSCP_Av is the average of the last 10 RSCP

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#JDRENH2 – Enhanced Jammed Detect & Report 2		SELINT 2
	measures. 0...100 (Factory default is 20). All the parameter settings are saved in NVM memory.	
AT#JDRENH2?	Read command reports the current behaviour mode, in the format: **#JDRENH2:** <**mode**>,<SAT2G>,<SAT3G>,<CARRNUM>,<P_RxLev_T2G>,<P_EcN0_T3G>,<P_RSCP_T3G>,0,0,0,0	
AT#JDRENH2=?	Test command reports the supported range of values for the parameters **#JDRENH2:** **(**<**mode**>**)**,(<SAT2G>),(<SAT3G>),(<CARRNUM>),(<P_RxLev_T2G>),(<P_EcN0_T3G>),(<P_RSCP_T3G>),(0),(0),(0),(0)	

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5.1.6.18. OTA Commands

5.1.6.18.1. OTA Set Network Access Point - #OTASNAP

#OTASNAP – OTA Set Network Access Point	**SELINT 2**
AT#OTASNAP=<addr>[,<company_name>]	Set command specifies the SMS number that the module has to use to send the Remote Registration SM. If the current IMSI hasn't been yet registered, the Remote Registration SM is automatically sent. Parameters: **<addr>** - string parameter which specifies the phone number **<company_name>** - string parameter containing a client identifier Note1: a special form of the Set command, **#OTASNAP=""**, causes the deletion of the SMS number Note2: the value of **<addr>** parameter can be overwritten from the OTA server by the Provisioning SMS Note3: a change of the value of **<company_name>** parameter causes a new FOTA Registration procedure Note4: if the **<company_name>** is an empty string, an ERROR is returned Note5: the setting is saved in NVM
AT#OTASNAP?	Read command reports the current settings in the format: **#OTASNAP: <addr>[,<company_name>]**
AT#OTASNAP =?	Test command returns the maximum length of **<addr>** field and maximum length of **<company_name>** field. The format is: **#OTASNAP: <nlength>,<tlength>** where: **<nlength>** - integer type value indicating the maximum length of field **<addr>** **<tlength>** - integer type value indicating the maximum length of field **<company_name>**
Example	AT#OTASNAP="*SMS* Number","*Client Alpha*" OK AT#OTASNAP? #OTASNAP:"*SMS Number*","*Client Alpha*" OK AT#OTASNAP=? #OTASNAP: 21,15 OK

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5.1.6.18.2. OTA Set User Answer - #OTASUAN

#OTASUAN – OTA Set User Answer	SELINT 2
AT#OTASUAN=<response>[,<mode>[,<bfr>]]	Set command: a) enables or disables sending of unsolicited result code #OTAEV that asks the TE to accept or reject the Management Server request to download a firmware b) allows the TE to accept or reject the request Parameters: **<response>** - numeric parameter used to accept or reject the download request 0 – the request is rejected 1 – the request is accepted 2 – the request is delayed indefinitely: the URC is prompted indefinitely until the request is accepted or reject **<mode>** - numeric parameter that controls the processing of unsolicited result code #OTAEV 0 –buffer unsolicited result codes in the MT; if MT result code buffers is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 –discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 –buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE **<bfr>** - numeric parameter that controls the effect on buffered codes when **<mode>** 1 or 2 is entered 0 – MT buffer of unsolicited result codes #OTAEV is cleared when **<mode>** 1 or 2 is entered 1 – MT buffer of unsolicited result codes #OTAEV is flushed to TE when **<mode>** 1 or 2 is entered Note: the following unsolicited result codes and the corresponding events are defined: #OTAEV: Do you want to upgrade the firmware? A management server request to start the firmware upgrade. The user answer is expected #OTAEV: User Answer Timeout Expected User Answer not received within server defined time interval #OTAEV: Automatic Fw Upgrade Requested An automatic Fw Upgrade procedure has started #OTAEV: Start Fw Download The firmware download is started

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#OTASUAN – OTA Set User Answer	SELINT 2
	#OTAEV: Fw Download Complete The firmware download is finished #OTAEV: OTA Fw Upgrade Failed The Fw upgrade has failed #OTAEV: Module Upgraded To New Fw The Fw upgrade is successfully finished #OTAEV: Server notified about successful FW Upgrade The final SMS has been sent to the server notifying the successful FW upgrade "#OTAEV: Registered" The module has registered itself to a server "#OTAEV: Not registered" The registration procedure has failed "#OTAEV: Company Name Registered" The company name is registered "#OTAEV: Company Name not registered" The company name is not registered "#OTAEV: Provisioned" A server has provisioned the module "#OTAEV: Notified" A server has notified the module
AT# OTASUAN?	Read command reports the current settings in the format: **#OTASUAN: ,<mode>,<bfr>**
AT#OTASUAN =?	Test command returns values supported as a compound value
Example	AT#OTASUAN=,2,1 OK AT#OTASUAN? #OTASUAN: ,2,1 OK AT#OTASUAN =? #OTASUAN: (0-2),(0-2),(0,1) OK

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5.1.6.18.3. OTA Set Ring Indicator - #OTASETRI

#OTASETRI - OTA Set Ring Indicator	**SELINT 2**
AT#OTASETRI=[<n>]	Set command enables/disables the Ring Indicator pin response to a manual OTA server request to start the firmware upgrade. If enabled, a negative going pulse is generated when the URC *"#OTAEV: Do you want to upgrade the firmware?"* is prompted (see **AT#OTASUAN** command). The duration of this pulse is determined by the value of **<n>**. Parameter: **<n> - RI** enabling 0 - disables **RI** pin response when the URC *"#OTAEV: Do you want to upgrade the firmware?"* is prompted (factory default) 50..1150 - enables **RI** pin response. The value of **<n>** is the duration in ms of the pulse generated when the URC *"#OTAEV: Do you want to upgrade the firmware?"* is prompted. Note: if the <response> parameter of the AT#OTASUAN command has the value 2, then the URC is prompted indefinitely until the Fw update request is accepted or reject and, for every URC, a pulse is generated. Note: the setting is saved in the profile parameters
AT#OTASETRI?	Read command reports the duration in ms of the pulse generated when the URC *"#OTAEV: Do you want to upgrade the firmware?"* is prompted, in the format: **#OTASETRI: <n>** Note: as seen before, the value **<n>=0** means that the **RI** pin response to the URC is disabled.
AT#OTASETRI =?	Reports the range of supported values for parameter **<n>**

5.1.6.18.4. Save IP Port and IP Address for OTA over IP - #OTAIPCFG

#OTAIPCFG – Save IP port and IP address for OTA over IP	**SELINT 2**
AT#OTAIPCFG=<IPort>,<IP addr>[,<unused>]	This command saves in NVM the IP port number and IP address of the OTA server. Parameters: **<IPort >:** IP port of the OTA server **<IPaddr>:** IP address of the OTA server, string type. This parameter can be any valid IP address in the format: "xxx.xxx.xxx.xxx" Note: the values set by the command are directly stored in NVM and don't depend on the specific CMUX instance. Note2: a special form of the Set command, #OTAIPCFG=<IPort>,"" sets the IP address to "0.0.0.0".
AT#OTAIPCFG?	Read command reports the currently selected **<IPort >** and **<IPaddr>** in the format: **#OTAIPCFG: <IPort >,<IPaddr>,0**
AT#OTAIPCFG=?	Test command reports the range of supported values for parameters **<IPort>** and **<unused>**

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5.1.6.18.5. Start an OTA Update over IP - #OTAIPUPD

#OTAIPUPD – Start an OTA Update over IP	SELINT 2
AT#OTAIPUPD	This command starts an OTA Update over IP. Note: in order to complete the update, the device has to be registered in the OTA server. Note: it is necessary to set some parameters beforehand: the bearer (CSD or GPRS) and the APN, through the command AT#OTASNAPIPCFG, the IP port and IP address, through the command AT#OTAIPCFG. After the command AT#OTAIPUPD has been set, some unsolicited messages will inform the user about the status of the update process: - **#OTAEV: Start Fw Download** - **#OTAEV: Fw Download Complete** - **#OTAEV: Module Upgraded To New FW** - **#OTAEV: Server notified about successfull FW Upgrade** **Or, in case of failure:** - **#OTAEV: OTA FW Upgrade Failed**
AT#OTAIPUPD?	Read command reports the current status of the OTA over IP: the value 1 is returned if the OTA over IP is running (in this case the user shall receive the unsolicited messages), 0 otherwise. **#OTAIPUPD: <status>**
AT#OTAIPUPD=?	Test command tests for command existence

5.1.6.18.6. Set IP Port and Address for OTA over IP - #OTASNAPIP

#OTASNAPIP – Set IP port and address for OTA over IP	**SELINT 2**
AT#OTASNAPIP=<IPort>,<IPaddr>[,<mynumber>[,<company_name>[,<unused>]]]	Set command specifies the IP port number and IP address that the module has to use to send the Remote Registration massage. If the current IMSI hasn't been yet registered, the Remote Registration message is automatically sent. Parameters: **<IPort>** - IP port of the OTA server **<IPaddr>** - IP address of the OTA server, string type. This parameter can be any valid IP address in the format: "xxx.xxx.xxx.xxx" **<mynumber>** - string parameter which specifies the phone number of the client **<company_name>** - string parameter containing a client identifier Note1: the command returns ERROR if the APN has not been set through the command AT#OTASNAPIPCFG Note2: a special form of the Set command, **#OTASNAP=<IPort>,""**, sets the IP address to "0.0.0.0". Note3: the values of **<IPort>** and **<IPaddr>** parameters can be overwritten from the OTA server by any SMS (Command, RSA Discovery Registration …) Note4: a change of the value of **<company_name>** parameter causes a new FOTA Registration procedure Note5: if the **<company_name>** is an empty string, an ERROR is returned Note6: all the settings are saved in NVM but < **mynumber**>
AT#OTASNAPIP?	Read command reports the current settings in the format: **#OTASNAPIP: <IPort>,<IPaddr>[,<company_name>],0**
AT#OTASNAPIP =?	Test command returns the range for **<IPort>** values and the maximum length of **<mynumber>** field and **<company_name>** field. The format is: **#OTASNAPIP: (0-65535),,<nlength>,<tlength>** where: **<nlength>** - integer type value indicating the maximum length of field **<mynumber>** **<tlength>** - integer type value indicating the maximum length of field **<company_name>**

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5.1.6.18.7. Set Access Point Name for OTA over IP - #OTASNAPIPCFG

#OTASNAPIPCFG – OTA Set Access Point Name for OTA over IP	SELINT 2
AT#OTASNAPIPCFG=<bearer>,<APN>[,<username>,<password>[,<rspTimeout>]]	Set command specifies the bearer (GSM or GPRS) and the APN that the module has to use to send the Remote Registration message. The APN is the Access Point Name in case of GPRS bearer or the internet service provider number in case of GSM bearer. Parameters: **<bearer>** **0** – Undefined (default value) 1 – GSM 2 - GPRS **<APN>** - string parameter; in case of GPRS bearer: Access Point Name, a logical name that is used to select the GGSN or the external packet data network; in case of GSM bearer: phone number of the internet service provider **<username>** - string parameter, used only if the context requires it **<password>** - string parameter, used only if the context requires it **<rspTimeout>** - used when waiting for a response from OTA server, after the module has sent a message: if there's no response within this timeout period the TCP connection is closed. 0 - no timeout 1..65535 - timeout value in seconds (default 300 s.) Note1: if the **<bearer>** is set to 0, then the APN is erased. If the bearer is already 0, any **<APN>** or **<username>** or **<password>** will not be set Note2: the values of **<bearer>, <APN>, <username>** and **<password>** parameters can be overwritten from the OTA server by any SMS (Command, RSA Discovery Registration …) Note3: all the settings are saved in NVM
AT#OTASNAPIPCFG?	Read command reports the current settings in the format: **#OTASNAPIPCFG:** **<bearer>,<APN>[,<username>[,<password>[,<rspTimeout>]]]**
AT#OTASNAPIPCFG =?	Test command returns the range for **<bearer>** values, the maximum length of **<APN>, <username>** and **<password>** string parameters and the range for **<rspTimeout>** values. The format is: **#OTASNAPIPCFG: (0-2),99,49,49,(0-65535)**

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5.1.6.18.8. OTA Registration status - #OTAREG

#OTAREG – OTA Registration status	SELINT 0/1/2
AT#OTAREG	Execution command reports the OTA registration status in the following form: **#OTAREG: <OTA_reg_status>,<OTA_registered_IMSI>** Where: **<OTA_reg_status>** - numeric parameter: - 0: module is not registered to the OTA server - 1: module is registered to the OTA server **<OTA_registered_IMSI>** - string parameter which contains the last IMSI that has been registered to OTA server. If there isn't any registered IMSI, then the value is FFFFFFFFFFFFFF Note: if any SIM isn't inserted in the module, then **<OTA_reg_status>** has value 0
AT#OTAREG=?	Test command returns **OK** result code.

Example	`//module has never been registered before to OTA server`
	`at#otareg`
	`#OTAREG: 0,FFFFFFFFFFFFFF`
	
	`OK`
	
	`//the current IMSI is 222887445252672`
	`at+cimi`
	`222887445252672`
	
	`OK`
	
	`//register the module to the OTA server`
	`at#otasnap=+39348XXXXXXX`
	
	`OK`
	
	`#OTAEV: Registered`
	
	`//module is registered to the OTA server with the IMSI 222887445252672`
	`at#otareg`
	`#OTAREG: 1,222887445252672`
	
	`OK`

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#OTAREG – OTA Registration status	SELINT 0/1/2

	//extract the SIM: the module is considered not registered because there isn't any inserted SIM; it's showed the last registered IMSI
	at#otareg
	#OTAREG: 0,222887445252672
	
	OK
	
	//insert a different SIM with IMSI 222015602268637
	at+cimi
	222015602268637
	
	OK
	
	//the module is not yet registered with the current IMSI so it's showed the last registered IMSI
	at#otareg
	#OTAREG: 0,222887445252672
	
	OK
	
	//the module is performing automatically the OTA registration
	
	#OTAEV: Registered
	
	//module is registered to the OTA server with the IMSI 222015602268637
	at#otareg
	#OTAREG: 1,222015602268637
	
	OK

5.1.6.19. eCall AT Commands

5.1.6.19.1. Initiate eCall - +CECALL

+CECALL – Initiate eCall	SELINT 2
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 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)
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>**.

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5.1.6.19.2. Embedded IVS inband modem enabling - #ECALL

#ECALL – Embedded IVS inband modem enabling	SELINT 2
AT#ECALL=<mode>	Set command enables/disables the embedded IVS modem. Parameters: **<mode>:** 0 – disable IVS (default) 1 – enables IVS Note: the sending of a MSD is pointed out with an unsolicited message through AT interface that can report the HL-ACK data bits or an error code in the following format: **#ECALLEV: <prim>,<data>** **<prim>:** 0 – Pull-IND 1 – Data_CNF 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.

5.1.6.19.3. Dial an Emergency Call - #EMRGD

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#EMRGD – dial an emergency call	**SELINT 2**
AT#EMRGD[=<par>]	This command initiates an emergency call. Parameters: **<par>:** 0 – initiates an emergency call without specifying the Service Category. (default value) 1..31 - sum of integers each representing a specific Emergency Service Category: 1 - Police 2 - Ambulance 4 - Fire Brigade 8 – Marine Guard 16 - Mountain Rescue 32 - Manually Initiated eCall (if eCall is supported – Rel8 feature) 64 - Automatically Initiated eCall (if eCall is supported– Rel8 feature) When the emergency call can initiate, an indication of the Service Categories selected is shown before the OK in the following format: **#EMRGD: <serv>[,<serv>..[,<serv]]** Where **<serv>** “Police “Ambul” “FireBrig” “MarineGuard” “MountRescue” “MIeC” “AIeC” Example: 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

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	network (Rel5 feature) and the associated service categories in the format **[#EMRGD: <num1>[,<par1>,<serv>[,<serv>..[,<serv]]]** **[#EMRGD: <num*n*>[,<par*n*>,<serv>[,<serv>..[,<serv]]]]** Where **<num*n*>** Is the emergency number (that can be dialled with ATD command). **<par*n*>** 1..31 - sum of integers each representing a specific Emergency Service Category: 1 - Police 2 - Ambulance 4 - Fire Brigade 8 – Marine Guard 16 - Mountain Rescue 32 - Manually Initiated eCall (if eCall is supported – Rel8 feature) 64 - Automatically Initiated eCall (if eCall is supported– Rel8 feature) Example: AT#EMRGD? #EMRGD: 123,2,"Ambul" #EMRGD: 910,5,"Police","FireBrig" OK
AT#EMRGD=?	Test command reports the supported range of values for parameter **<par>**. If eCall is supported 0-32,64 If eCall is not supported 0-31

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5.1.6.19.4. IVS push mode activation - #MSDPUSH

#MSDPUSH – IVS push mode activation	SELINT 2
AT#MSDPUSH	Execution command enables IVS to issue the request for MSD transmission. It reuses downlink signal format to send a initiation message to the PSAP.
AT#MSDPUSH=?	Test command returns the **OK** result code.

5.1.6.19.5. Sending MSD data to IVS - AT#MSDSEND

#MSDSEND – Sending MSD data to IVS	SELINT 2
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 (**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 140; trying to send more data will cause the surplus to be discarded and lost.
AT#MSDSEND=?	Test command returns the **OK** result code.

5.1.6.19.6. Read MSD - #MSDREAD

#MSDREAD– Read MSD	SELINT 2
AT#MSDREAD	Execution command returns the last MSD set by **#MSDSEND**
AT#MSDREAD?	Read command returns the last MSD set by **#MSDSEND**
AT#MSDREAD=?	Test command returns OK
Example	AT#MSDREAD > 234234234234

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	OK AT#MSDREAD #MSDREAD: 234234234234000000000000000000000000000000000000000000000000 000000000000000000000000000000000000000000000000000000000000 000000000000000000000000000000000000000000000000000000000000 000000000000000000000000000000000000000000000000000000000000 00000000000000000000000000000000000000000000 OK

5.1.6.19.7. Configure Network Deregister Timer - #ECALLNWTMR

#ECALLNWTMR – Configure Network Deregister Timer	SELINT 2
AT#ECALLNWTMR=[<DEREGISTER_TIMER>]	Set command sets timers which are related network deregistration Parameters: **<DEREGISTER_TIMER>** - integer Timer value in units of minutes: 1..65535 – Set the time after which the GSM and UMTS communication module terminates network registration (default value:720) Note: The setting is saved in NVM and available on following reboot.
AT# ECALLNWTMR?	Read command reports the current parameter value.
AT# ECALLNWTMR=?	Test command reports the supported range of values for parameters

5.1.6.19.8. Reconfigure eCALL Timer - #ECALLTMR

#ECALLTMR - Reconfigure eCALL Timer	SELINT 2
AT#ECALLTMR=[<AL_ACK_PERIOD>,<SIGNAL_DURATION>,<SEND_MSD_PERIOD>,<MSD_MAX_TRASMIT_TIME>]	Set command sets timers related eCall. Parameters: **<AL_ACK_PERIOD>** - integer Timer value in units of milliseconds: 1000..65535 – set AL-ACK Period (default value: 5000) **<SIGNAL_DURATION>** - integer Timer value in units of milliseconds: 1000.. 65535 – set the IVS initiation signal duration (default value: 2000) **<SEND_MSD_PERIOD>** - integer

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	Timer value in units of milliseconds: 1000..65535 – set the SEND_MSD duration (default value: 5000) <**MSD_MAX_TRASMIT_TIME**> - integer Timer value in units of seconds: 10..65535 – set the maximum MSD transmission duration (Default value:20). If a value is omitted for a particular parameter then this parameter will be keep old set value Note: The setting is saved in NVM and available without reboot.
AT# ECALLTMR?	Read command reports the current parameter value.
AT# ECALLTMR=?	Test command reports the supported range of values for parameters

5.1.6.19.9. enable/disable eCall urc regarding voice channel - #ECALLURC

#ECALLURC- enable/disable eCall urc regarding voice channel	
AT#ECALLURC=<mode>	Set command enable /disable URC regarding voice channel Parameter: **<mode>** 0 –eCall URC version 1(default) 1 –eCall URC version 2 2 –eCall URC version 3 If eCall URC version 2 is used, #ECALLEV: 11 and 12 URC are enabled. If eCall URC version 3 is used, #ECALLEV: 5 and 6,7 URC are enabled(Version 3 includes Version 2) #ECALLEV: 5 – T5 expiring , IVS automatically unmutes downlink and uplink #ECALLEV: 6 – T6 expiring , IVS automatically unmutes downlink and uplink #ECALLEV: 7 – T7 expiring , IVS automatically unmutes downlink and uplink #ECALLEV: 11 - mute, IVS disconnects microphone and speaker from speech codec and connects In-band Modem to speech codec #ECALLEV: 12 - unmute, IVS disconnects In-band Modem from speech codec and connects microphone and speaker to speech codec.
AT#ECALLURC?	Read command reports the currently selected cellular network, in the format:

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#ECALLURC- enable/disable eCall urc regarding voice channel	
AT#ECALLURC =?	Test command returns the list of supported values.

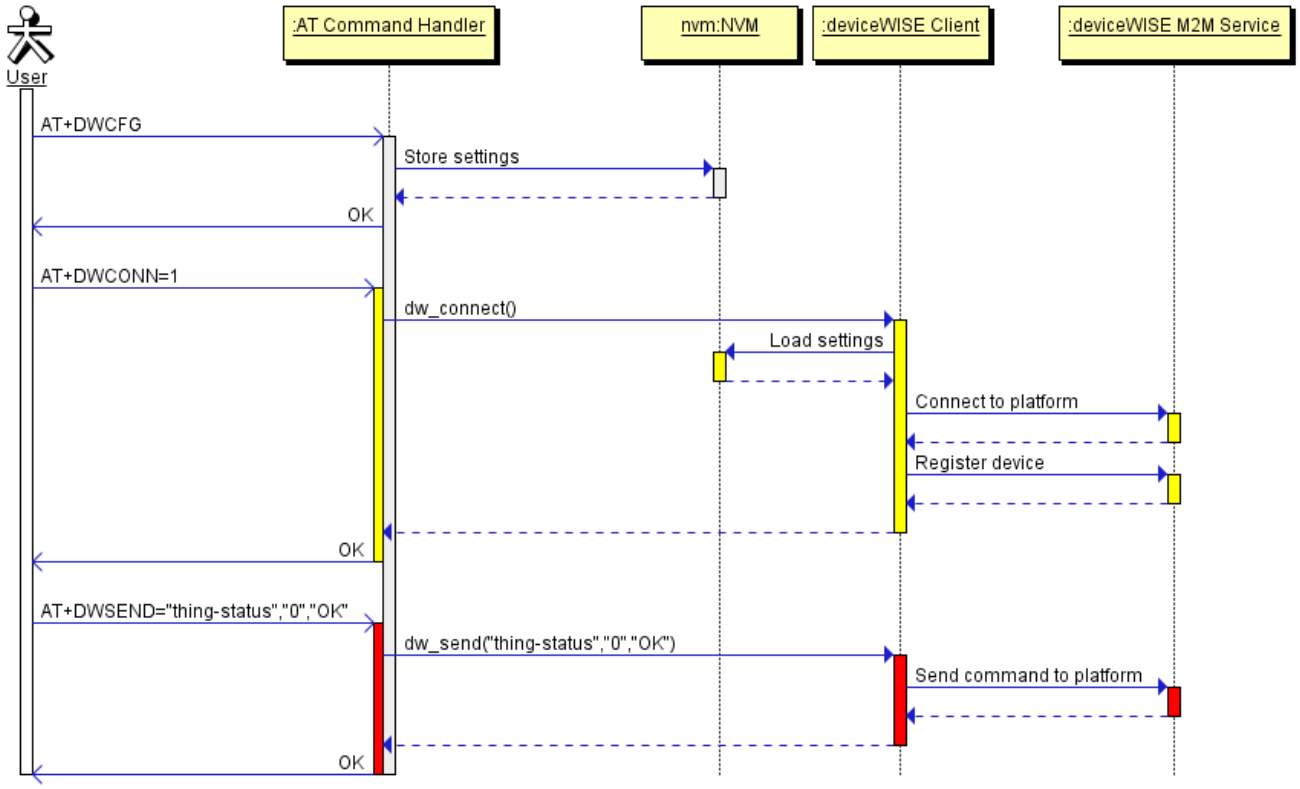
5.1.6.19.10. set eCall Only mode - #ECONLY

#ECONLY – set eCall Only mode	SELINT 2
AT#ECONLY=<mode>	This command enables/disables the eCall Only mode of operation. Parameters: **<mode>:** 0 – disable eCall Only mode, normal mode 1 - enable eCall Only mode if eCall only subscription is available (default) 2 – enable eCall Only mode even if eCall only subscription is not available Note: the value set by command is directly stored in NVM and doesn't depend on the specific CMUX instance. Note: the new setting can cause an automatic reboot of module.
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>**.

5.1.6.20. m2mAIR Cloud Commands

The following AT commands regard the deviceWISE functionality.

Here is a basic interaction diagram:



5.1.6.20.1. Configure deviceWISE parameters - #DWCFG

#DWCFG – configure deviceWISE parameters	SELINT 2
AT#DWCFG=[<serverUrl>[,<deviceIDSelector>[,<appToken>[,<security>[,<heartBeat>[,<autoReconnect>[,<overflowHandling>[,<atrunInstanceId>[,<serviceTimeout>[,<contextID>[,<unused_1>[,<unused_2>]]]]]]]]]]]]	This command sets the parameters related to the deviceWISE functionality Parameters: **<serverUrl>** - String parameter indicating the URL of the M2M Service instance in address:port form. **<deviceIDSelector>** 0 – 1 (0=IMEI 1=CCID/ESN), basically 0 if not SIM card or CDMA ID installed **<appToken>** - The secure application token provided in the Management Portal, typically a string of 16 characters.. **<security>** - Flag indicating if the SSL encryption is enabled. 0 – SSL encryption disabled (default) 1 – SSL encryption enabled If SSL encryption enabling is required, some initial settings have

#DWCFG – configure deviceWISE parameters	SELINT 2
	to be done as follows. For further details, refer to "SSL/TLS User Guide". SSL channel has to be enabled as follows: AT#SSLEN=1,1 OK If server authentication is needed, **#SSLSECCFG** has to be set as follows: AT#SSLSECCFG=1,0,1,0 OK Then, CA Certificate(DER format) has to be stored as follows: AT#SSLSECDATA=1,1,1,<size> > …… // store CA Certificate OK Note: Only the configuration SSL commands listed above are admitted. DW connection in secure mode cannot be used contemporarily to any command starting an SSL connection (including SSL sockets, FTPS, secure SMTP and HTPS). **<heartBeat>** - If no packets are received in the number of seconds specified in the heartbeat field, a heartbeat message will be sent to keep the connection alive. Default: 60 Range: 10 - 86400 **<autoReconnect>** - Flag indicating if the connection manager should automatically reconnect to the service. 0 – auto-reconnect disabled 1 – auto-reconnect lazy - reconnect on next send and every 3600 seconds. 2 – auto-reconnect moderate (default) - reconnect 120 seconds, then every 3600 seconds after the first day. 3 – auto-reconnect aggressive - reconnect every 120 seconds. **<overflowHandling>** - Flag indicating if the way to handle overflows in data management. 0 – FIFO (default) 1 – LIFO

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#DWCFG – configure deviceWISE parameters	SELINT 2
	<atrunInstanceId> - AT instance that will be used by the service to run the AT Command. Default 4 Range 0 – 4 **<serviceTimeout>** - It defines in seconds the maximum time interval for a service request to the server. Default 5 Range 1 – 120 **<contextID>** - the PDP context used for the network connection. Default 1 Range 1 – 5
AT#DWCFG?	Read command returns the current settings in the format: **#DWCFG:** **<serverUrl>,<deviceIDSelector>,<appToken>,<security>,<heartBeat>,<autoReconnect>,<overflowHandling>,<atrunInstanceId>,<serviceTimeout>,<contextID>,0,0**
AT#DWCFG=?	Test command returns the supported range of parameters **<deviceIDSelector>, <security>, <heartBeat>, <AutoReconnect>,<overflowHandling>,<atrunInstanceId>** , **<serviceTimeout>** and **<contextID>,** and the maximum length of **<serverUrl> and <appToken>** parameters.

5.1.6.20.2. Connect to M2M Service - #DWCONN

#DWCONN – connect to M2M Service	SELINT 2
AT#DWCONN=<connect>	Set command connects/disconnects to the M2M Service. Parameters: **<connect>** - flag to connect/disconnect to the M2M Service 0 – disconnect (default) 1 – connect Note: **AT#DWCONN=1** performs the socket connection and the MQTT connection. **AT#DWCONN=0** performs the socket disconnection. Note: the PDP Context used for the network connection is the first

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	(**<cid>**=1 has to be previously defined with **AT+CGDCONT** command and activated with **AT#SGACT** command) Note: if the secure mode connection has been enabled, it cannot be used contemporarily to any command starting an SSL connection (including SSL sockets, FTPS, secure SMTP and HTPS).
AT#DWCONN?	Read command returns the current settings for all parameters in the format: **#DWCONN: <connect>>,<status>** Where: **<connect>** is defined as above **<status>** is the real connection status. Values: 0 = disconnected 1 = trying to connect 2 = connected 3 = waiting to connect
AT#DWCONN=?	Test command reports the supported range of values for all parameters

5.1.6.20.3. Query connection status - #DWSTATUS

#DWSTATUS – query connection status	SELINT 2
AT#DWSTATUS	Execution command returns the status of the connection, including some runtime statistics. Note, all statistics should be stored in RAM, not NVM. The Cloud will return a generic structure **#DWSTATUS:** **<connected><lastErrorCode>,<latency>,<pktsIn>,<pktsOut>,<bytesIn>,<bytesOut>** **<connected>** : 3 = waiting to connect, 2 = connected, 1 = trying to connect, 0 = disconnected **<lastErrorCode>**: last error code encountered by the client **<latency> :** milliseconds measured between last request and reply. **<pktsIn> :** number of packets received, tracked by the server **<pktsOut> :** number of packets sent. **<bytesIn>** : number of bytes received, TCP/IP payload **<bytesOut>** : number of bytes sent.
AT#DWSTATUS=?	Test command reports **OK** result code

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5.1.6.20.4. Send data to M2M Service - #DWSEND

#DWSEND – send data to M2M Service	SELINT 2
AT#DWSEND=<type>,<param_>[,<param_2>[,…[<param_n>]]]	Execution command permits to send formatted data to the M2M Service. Parameters: **<type>** - type code for the type of message to send. (0 for normal request; 1 for method request; 2 for method update; 3 for method ack) **Type 0 message format:** <param_1> - command – the api command to execute. **<param_i>** - string parameter indicating the i-th parameter, with i=1,…,24. **Type 1 message format:** **<param_1>** - "thingKey" – the key of a thing to execute. **<param_2>** - timeout – time to wait in seconds before returning an error for the request. **<param_3>** - method – the method key of a thing to execute. **<param_4>** - is singleton – 0 or 1. 1 if no more than one of these instances can exist. **<param_5+>** - parameters for the method. String parameter indicating the i-th parameter, with i=1,…,20. **Type 2 message format:** **<param_1>** - id – the identification of the method instance. **<param_2>** - message – a message represents the current status of the method. **Type 3 message format:** **<param_1>** - id – the identification of the method instance. **<param_2>** - status – the integer result status for the execution. 0 is reserved for OK. <**param_3 when status is set to non-zero**> - error message associated with the status. <**param_3 when status is set to zero**> - return parameters for the method. Key value pair should be used. **param_i** should be the name of the element and **param_i+1** should be the value of the element.

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	Note: there is no limit on the length of the single **<param_i>**, but there is a limit in the total length of the AT command string, that cannot exceed 400 characters. If this threshold is exceeded, then an ERROR is raised. There is also a limit of 20 messages on the receive queue. If the queue is full, the consequent send will still succeed but the response for that particular request will be dropped until an item is removed from this queue (See command AT#DWRCV and AT#DWRCVR). Note: the response to the **AT#DWSEND** command reports the **<msgId>** value that identifies the sending. Note: if data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: it's possible to use **AT#DWSEND** only if the connection has been opened with **AT#DWCONN**
AT#DWSEND=?	Test command reports the maximum length of **<type>** parameter.

5.1.6.20.5. Send raw data to M2M Service - #DWSENDR

#DWSENDR – send raw data to M2M Service	SELINT 2
AT#DWSENDR=<dataLen>	Execution command permits to send raw data to the M2M Service. Content must be valid JSON. Parameters: **<dataLen>** - number of bytes to be sent Range: 1 - 1500 The module responds to the command with the prompt <greater_than><space> and waits for the data to send. When **<dataLen>** bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is OK. If data sending fails for some reason, an error code is reported. Note: the response to the **AT#DWSENDR** command reports the **<msgId>** value that identifies the sending. There is also a limit of 20 messages on the receive queue. If the queue is full, the consequent send will still succeed but the response for that particular request will be dropped until an item is removed from this queue (See command AT#DWRCV and AT#DWRCVR). Note: it's possible to use **AT#DWSENDR** only if the connection has been opened with **AT#DWCONN**

AT#DWSENDR=?	Test command reports the supported range of values for **<dataLen>** parameter

5.1.6.20.6. Receive data from M2M Service - #DWRCV

#DWRCV – Receive data from M2M Service	SELINT 2
AT#DWRCV=<msgId>	Execution command permits the user to read formatted data arriving from M2M Service; the module is notified of these data by the URC **#DWRING**. Parameters: **<msgId>** - index of the data message to receive, as indicated in the URC **#DWRING** Range: >=1 If the received data are the consequence of a previous data sending issued by **AT#DWSEND**, then the **<msgId>** value is the same of the **<msgId>** value reported in the answer of **AT#DWSEND**. The incoming Server data are notified by the URC **#DWRING** with the following format: **#DWRING: <type>,<msgId>,<len>** where: **<type>** - type of message to receive **<msgId>** - index of the data message to receive **<len>** - length of data message to receive If the incoming data are accepted with **AT#DWRCV**, then the formatted data are received and showed with the following URC: **#DWDATA:** **<msgId>,<error>,<len>,<param_1>[,<param_2>[,…[,<param_n>]]]** where: **<msgId>** - defined as above <error> - error code of the message to receive, 0 if there is no error. **<len>** - defined as above **<param_i>** - string parameter indicating the i-th parameter associated to the type specified Note: it is possible to use **AT#DWRCV** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error.

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#DWRCV – Receive data from M2M Service	SELINT 2
	If the data received are the consequence of a previous data sending issued by **AT#DWSEND**, then they can be read only using **AT#DWRCV** command and not **AT#DWRCVR** command (i.e.: **AT#DWRCV** and **AT#DWRCVR** are not interchangeable).
AT#DWRCV=?	Test command reports the supported range of values for all parameters.

5.1.6.20.7. Receive raw data from M2M Service - #DWRCVR

#DWRCVR – Receive raw data from M2M Service	SELINT 2
AT#DWRCVR=<msgId>	Execution command permits the user to read raw data arriving from M2M Service; the module is notified of these data by the URC **#DWRING**. Parameters: **<msgId>** - index of the data message to receive, as indicated in the URC **#DWRING** Range: >=1 If the data received are the consequence of a previous data sending (issued by **AT#DWSENDR**), then the **<msgId>** value is the same of the **<msgId>** value reported in the answer of **AT#DWSENDR**. The incoming Server data are notified by the URC **#DWRING** with the following format: **#DWRING: <type>,<msgId>,<len>** where: **<type>** - type of the data message to receive **<msgId>** - index of the data message to receive **<len>** - length of data message to receive If the incoming data are accepted with **AT#DWRCVR**, then the data are received and showed with the following URC: **#DWRDATA: <msgId>,<error>,<len>,<data>** where: **<msgId>** - defined as above **<error>** - error code of the message to receive, 0 if there is no error. **<len>** - defined as above **<data>** - M2M Service data Note: it is possible to use **AT#DWRCVR** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error.

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#DWRCVR – Receive raw data from M2M Service	SELINT 2
	If the data received are the consequence of a previous data sending issued by **AT#DWSENDR**, then they can be read only using **AT#DWRCVR** command and not **AT#DWRCV** command (i.e.: **AT#DWRCV** and **AT#DWRCVR** are not interchangeable).
AT#DWRCVR=?	Test command reports the supported range of values for all parameters.

5.1.6.20.8. List information on messages pending from M2M Service - #DWLRCV

#DWLRCV – List information on messages pending from M2M Service	SELINT 2
AT#DWLRCV	Execution command permits the user to obtain information regarding the messages pending from M2M Service in the following format: **#DWLRCV:** **<msg_number>[,<msgId_1>,<msg_1_len>[,<msgId_2>,<msg_2_len>[,……<msgId_n>,<msg_n_len>]]]** where: **<msg_number>** - number of messages pending from M2M Service Range: >=0 **<msgId_i>** - index of the i-th data message to receive **<msg_i_len>** - length of the i-th data message to receive Note: it is possible to use **AT#DWLRCV** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error.
AT#DWLRCV=?	Test command reports **OK** result code

5.1.6.20.9. Enable Agent Features - #DWEN

#DWEN – enable agent features	SELINT 2
AT#DWEN=<feat>,<en>[,<option1>[,<option2>[,<option3>[,<option4>[,<option5>]]]]]	Set command permits to enable/disable up to 8 different deviceWISE features. Parameters: **<feat>** - feature to enable or disable; range (0-7) 0 – remote at commands 1 … 7 – reserved for future use. **<en>** - enable or disable the features 0 – disable the feature 1 – enable the feature

	<optionX> where X=1,..,5 - optional parameters depending on the feature (string) Note: feature 0 (Remote AT commands) has no option. Note: the **<en>** value is considered only at the very first connection to M2M Service (**AT#DWCONN=1**) after a device power on or reboot
AT#DWEN?	Read command returns the current settings for each feature in the format: **#DWEN:** **<feat>,<en>,<option1>,<option2>,<option3>,<option4>,<option5>**
AT#DWEN=?	Test command reports the supported range of values for parameters **<feat>** and **<en>** and the maximum length of **<optionX>** (where X=1,..,5) parameters

5.1.6.21. Advanced Encryption Standard AT commands

5.1.6.21.1. Load the security data - #AESSECDATA

#AESSECDATA – Load the security data	**SELINT 2**
AT#AESSECDATA=<Action>[,<Size>]	Execution command allows to store, delete and read security data AES key into NVM. Parameters: <Action> - Action to do. 0 – Delete data from NVM. 1 – Store data into NVM. 2 – Get MD5 digest of data into NVM <Size> - Size of AES key to be stored Admitted values: - 16 number of bytes used for AES128 - 24 number of bytes are used for AES192 - 32 number of bytes are used for AES256 If the <Action> parameter is 1 (store data into NVM) the device responds to the command with the prompt '>' and waits for the data to store. When < Size > bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is **OK.** If data sending fails for some reason, an error code is reported Note: <size> parameter is mandatory if the store action is issued, but

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	it has to be omitted for delete or get actions are issued.
AT#AESSECDATA?	Read command return the present of security data in NVM #AESSECDATA: <AESKeyIsSet> <AESKeyIsset> is 1 if related data are stored into NVM otherwise 0.
AT#AESSECDATA=?	Test command returns the range of supported values for all the parameters

5.1.6.21.2. Encrypt data - #AESENCRYPT

#AESENCRYPT – encrypt data	SELINT 2
AT#AESENCRYPT	Execution command encrypts data with AES algorithm The device responds to the command with the prompt '>' <greater_than><space> and waits for the data to send. When bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is **OK.** If data sending fails for some reason, an error code is reported Note: the command accept only 1 block of 16 bytes Note**:** If AES key isn't loaded the command returns error
AT#AESENCRYPT=?	Test command returns the number of bytes to be sent after the prompt #AESENCRYPT: (16) If AES key isn't loaded the command returns: **#AESENCRYPT: (0)**

5.1.6.21.3. Decrypt data - #AESDECRYPT

#AESDECRYPT – decrypt data	SELINT 2
AT#AESDECRYPT	Execution command decrypts data with AES algorithm The device responds to the command with the prompt '>' <greater_than><space> and waits for the data to send.

	When bytes have been sent, operation is automatically completed. If data are successfully sent, then the response is **OK.** If data sending fails for some reason, an error code is reported Note: the command accept only 1 block of 16 bytes Note: If AES key isn't loaded the command returns error
AT#AESDECRYPT=?	Test command returns the number of bytes to be sent after the prompt #AESDECRYPT: (16) If AES key isn't loaded the command returns: **#AESDECRYPT: (0)**

5.1.6.21.4. Result of AES calculation - #AESGETRESULT

#AESGETRESULT– result of calculation AES	SELINT 2
AT#AESGETRESULT	Execution command reads calculated data, result of AES encrypt or decrypt. Note: If the AES algorithm is idle or working mode, then the command returns ERROR
AT# AESGETRESULT?	Read command returns the state of AES encrypt or decrypt previously given **#AESGETRESULT: <ResultAES>** Where **<ResultAES>** can assume the following values: 0: Idle or working mode 1: AES encrypt/decrypt finished
AT# AESGETRESULT=?	Test command returns **OK** result code

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5.1.6.22. Ethernet Control Mode (ECM) AT commands

5.1.6.22.1. ECM setup - #ECM

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

5.1.6.22.2. ECM configure - #ECMC

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

	1 – custom mask 2 – custom gateway 3 – custom dns 1 4 – custom dns 2 <Address> - Parameter id: a valid IP address in the format xxx.xxx.xxx.xxx Note: if a parameter is different from 0.0.0.0 then it is used instead the default one.
AT#ECMC?	Read command returns the last session configuration in the following format: # ECMC: <Did>,<State>,<Address>,<Address_Mask>,<Address_Gateway>,<Address_Dns1>,<Address_Dns2>,<Address_Custom>,<Address_CustomMask>,<Address_CustomGateway>,<Address_CustomDns1>,<Address_CustomDns2> ... OK where <Did> is currently 0 <State> can be: 0 - disabled 1 – enabled <Address> is the IP address assigned by the network <Address_Mask> is the default mask obtained from IP address <Address_Gateway> is the default IP address of gateway, obtained from IP address <Address_Dns1> is the IP address of the first DNS server, assigned by the network <Address_Dns2> is the IP address of the second DNS server, assigned by the network <Address_Custom> is the custom IP address <Address_CustomMask> is the custom mask <Address_CustomGateway> is the custom IP address of gateway <Address_CustomDns1> is the custom IP address of the first DNS server <Address_CustomDns2> is the custom IP address of the second DNS server
AT#ECMC=?	Test command returns the range of supported values for all the parameters.

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5.1.6.22.3. ECM shutdown - #ECMD

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

5.1.6.23. Software Management Service (SWM) AT commands

5.1.6.23.1. SWM Client Enable / Disable - #SWMENA

#SWMENA – SWM Client Enable / Disable	
AT#SWMENA=<mode>	Execution command, used to enable/disable the SWM Client feature. Parameters: <**mode**> 0 – disable (default) 1 – enable
AT#SWMENA?	Read command reports the current setting of SWM Client <**mode**> and <**status**> in the format: **#SWMENA: <mode>,<status>** where: <**status**> - service status 0 – not connected

#SWMENA – SWM Client Enable / Disable	
	1 – connected
AT#SWMENA=?	Test command reports the supported range of values for the **<mode>** parameter.
Example	AT#SWMENA=? #SWMENA: (0,1) OK AT#SWMENA? #SWMENA: 0,0 OK AT#SWMENA=1 OK AT#SWMENA? AT#SWMENA: 1,0 OK

5.1.6.23.2. Configure SWM Client Parameters - #SWMCFG

#SWMCFG – Configure SWM Client Parameters	
AT#SWMCFG=[<max_avail_size_ext_storage>[,<pdpId>[,<enableInRoaming>[,<enableReleaseNoteURL>[,<pollingIntervalInHours>[,<bootupPollingInterval>[,<recoveryPollingInterval>[,<secureConnection>]]]]]]]	Set command configures the parameters related to SWM Client. Parameters: **<max_avail_size_ext_storage>** - maximum available size in bytes of the external storage. For external application updates. Default: 0. **<pdpId>** - PDP context identifier the SWM client should use on the module. Range: 1-5; Default: 1 **<enableInRoaming>** - Flag indicating if DM sessions are allowed in cellular roaming conditions. 0 – DM sessions not allowed in roaming (default) 1 – DM sessions allowed in roaming **<enableReleaseNoteURL>** - Flag indicating if unsolicited ring notifications for #SWMCHKUPD and #SWMRING will contain the release note strings even if they are present in the DM session. 0 – release note not present in URC (default) 1 – release note present in URC

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#SWMCFG – Configure SWM Client Parameters	
	<pollingIntervalInHours> - Integer parameter indicating the span of time in hours between automatic DM session initiations by the SWM client. Valid value is >=0. A value of 0 means no polling. Default is stored parsed as part of the DM tree: 168. **<bootupPollingInterval>** - Integer parameter indicating the span of time in minutes between device boot and a one time DM session initiation by the SWM client. Valid value is >=0. A value of 0 means no polling after device boot. Default is stored parsed as part of the DM tree: 60. **<recoveryPollingInterval>** - Integer parameter indicating the next polling clock time when the device initiated (polling) session has failed. The value should be smaller than **<pollingIntervalInHours>**. Valid value is >=0. A value of 0 means no polling. Default is stored parsed as part of the DM tree: 2. **<secureConnection>** - Flag indicating if the SSL encryption is enabled. Not yet implemented. 0 – SSL encryption disabled (default) 1 – SSL encryption enabled (not yet implemented) Note: if SSL encryption is enabled, another secure socket will not be available for the application. Note: if the parameter **<max_avail_size_ext_storage>** has value 0, then the external application handling is not supported/required. Note: the configuration has to be done before enabling SWM. Issuing the **AT#SWMCFG** set command after **AT#SWMENA=1** will raise an error.
AT#SWMCFG?	Read command reports the current values of parameters in the format: **#SWMCFG: <max_avail_size_ext_storage>,<pdpId>,<enableInRoaming>,<enableReleaseNoteURL>,<pollingIntervalInHours>,<bootupPollingInterval>,<recoveryPollingInterval>,<secureConnection>**
AT#SWMCFG=?	Test command reports the supported range of values for all the parameters.

5.1.6.23.3. Configure Bootstrap - # SWMBOOTSTRAP

#SWMBOOTSTRAP – Configure Bootstrap	
AT#SWMBOOTSTRAP=<se	Set command configures the DM parameters like server URL and access

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#SWMBOOTSTRAP – Configure Bootstrap	
rverId>,<name>,<serverURL >,<serverAuthType>,<server AuthName>,<serverAuthSecr et>,<serverAuthData>,<client AuthType>,<clientAuthName >,<clientAuthSecret>,<client AuthData>	credentials, required for the DM sessions. Parameters: **<serverId>** - string parameter that identifies the server **<name>** - string parameter indicating the name of the bootstrap parameters set **<serverURL>** - string parameter indicating the URL of the SWM server in *address:port* form. The *address* substring shall start with "http://" or "https://", otherwise an error is raised. **<serverAuthType>** - integer parameter indicating the authentication type at the server side: 0 – BASIC 1 – DIGEST 2 – MD5 **<serverAuthName>** - string parameter indicating the username in the server authentication **<serverAuthSecret>** - string parameter indicating the password in the server authentication **<serverAuthData>** - string parameter indicating the nonce in the server authentication **<clientAuthType>** - integer parameter indicating the authentication type at the client side: 0 – BASIC 1 – DIGEST 2 – MD5 **<clientAuthName>** - string parameter indicating the username in the client authentication **<clientAuthSecret>** - string parameter indicating the password in the client authentication **<clientAuthData>** - string parameter indicating the nonce in the client authentication Note: the command is allowed only if SWM Client is enabled (i.e. **AT#SWMENA?** answers 1 for **<mode>** parameter)
AT#SWMBOOTSTRAP?	Read command reports the current values of parameters in the format:

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#SWMBOOTSTRAP – Configure Bootstrap	
	#SWMBOOTSTRAP: <serverId>,<name>,<serverURL>,<serverAuthType>,<serverAuthName>,<serverAuthSecret>,<serverAuthData>,<clientAuthType>,<clientAuthName>,<clientAuthSecret>,<clientAuthData> The showed values are those of the tree.
AT#SWMBOOTSTRAP =?	Test command reports the supported range of values for all the parameters.

5.1.6.23.4. Enable/Disable Self Registration - #SWMREG

#SWMREG –Enable/Disable Self Registration	
AT#SWMREG=<mode>[,<domainName>[,<PIN>]]	Set command enables/disables in the SWM Client the self-registration functionality to an SWM Center service domain. In case self-registration is enabled, the SWM client will use the domainName and PIN combination to register upon first OMA-DM session to the correct customer domain (account) in the SWM Center server. Parameters: **<mode>** 0 – disable (default) 1 – enable **<domainName>** - String parameter indicating the SWM Center domain name to register to. If absent, then a predefined default one is used from the DM tree configuration. **<PIN>** - String parameter indicating the PIN code for registration into the domain. If absent, then a predefined default one is used from the DM tree configuration. Note: after a successful self-registration, any later attempt will not have any effect. Note: the self-registration failure is notified with the following URC: **#SWMRING: 1[, <notificationDescription>]** Note: the self-registration is possible only if SWM has previously been enabled by issuing **AT#SWMENA=1** command.
AT#SWMREG?	Read command reports the current setting of **<mode>** parameter in the format:

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#SWMREG –Enable/Disable Self Registration	
	#SWMREG: <mode> The registration credentials are not reported for security reasons.
AT#SWMREG=?	Test command reports the supported range of values for the **<mode>** parameter and the maximum length of **<domainName>** and **<PIN>** parameters in the format: **#SWMREG: (list of supported <mode>s),<domainLength>,<pinLength>** where: **<domainLength>** - integer type value indicating the maximum length of field **<domainName>** **<pinLength>** - integer type value indicating the maximum length of field **<PIN>**.

5.1.6.23.5. Check updates - #SWMCHKUPD

#SWMCHKUPD – Check updates	
AT#SWMCHKUPD	Execution command, used to trigger a DM Session for querying the OMA-DM server for a pending update. Note: if successful, the command returns a final result code OK. Then, when an update checking is done, a URC is received: #**SWMCHKUPD**:<**isUpdateAvailable**>[,<**totalPackageSizeInBytes**>[,<**description**>**[,<releaseNoteURL**>]]] where: <**isUpdateAvailable**> 0 – No update is available. 1 – Update is available. <**totalPackageSizeInBytes**> - Size of update package in bytes. **<description>** - Description of the release package <**releaseNoteURL**> - OMA-DM Server URL where the package release note is located. Note: The <**totalPackageSizeInBytes**> parameter is optional and will be present in the response in case an update package is pending on the OMA-DM server side. The <**releaseNoteURL**> parameter is optionally available if there is a descriptive release note string associated with the update package

#SWMCHKUPD – Check updates	
	and if <**enableReleaseNoteURL**>=**1** in **#SWMCFG**. Note: the command raises an error if issued before **AT#SWMENA=1**.
AT#SWMCHKUPD=?	Test command returns the **OK** result code.
Example	(*Update is available*) AT#SWMCHKUPD OK #SWMCHKUPD: 1,4096, Minor Bug Fixes and Added Functionality (*No Update is available*) AT#SWMCHKUPD OK #SWMCHKUPD: 0

5.1.6.23.6. Download update package from OMA-DM software management server - #SWMGETDP

#SWMGETDP – Download update package from OMA-DM software management server.	
AT#SWMGETDP= <status>	Execution command confirms SWM client to proceed and download an update package after receiving a URC **#SWMCHKUPD**: 1,<**totalPackageSizeInBytes**>[,<**description**>**[,<releaseNoteURL>]]** Parameters: <**status**> - User action for confirmation 0 – Reject 1 – Accept Note: if successful, commands returns a final result code OK. Then, a URC is received: **#SWMDLPRGRSS:** **<accumulativeReceivedBytes>,<totalDPSizeInBytes>** where: <**accumulativeReceivedBytes**>: current size in bytes of the downloaded portion of the package <**totalDPSizeInBytes**>: total size in bytes of the package Note: when download is done successful, the following URC is received:

#SWMGETDP – Download update package from OMA-DM software management server.	
	- **#SWMRING: 2[,<description>[,<releaseNoteURL>]]** Note: the command raises an error if issued before **AT#SWMENA=1**.
AT#SWMGETDP=?	Test command reports the supported range of values for the **<status>** parameter.
Example	AT#SWMCHKUPD OK #SWMCHKUPD: 1,1024,"Description of update package","Release Note URL" AT#SWMGETDP=1 OK #SWMDLPRGRSS: 0,1024 #SWMDLPRGRSS: 1024,1024 #SWMRING: 2,"Description of update package","Release Note URL"

5.1.6.23.7. Install software update package - #SWMDEPLOYDP

#SWMDEPLOYDP – Install software update package	
AT#SWMDEPLOYDP=<status>	Execution command confirms SWM client to install update package after a URC **#SWMRING: 2[,<description>[,<releaseNoteURL>]]** Parameters: <**status**> - User action for confirmation 0 – Reject 1 – Accept Note: if the update requires a device reboot, the device will be rebooted silently. Note: when a FUMO update is done, a URC is received #**SWMRING**: <**notificationId**>[<**description**>[,<**releaseNoteURL**>]] where: <**notificationId**>

#SWMDEPLOYDP – Install software update package	
	4 – Firmware update successfully deployed 5 – Firmware update failed Note: the command raises an error if issued before **AT#SWMENA=1**.
AT#SWMDEPLOYDP=?	Test command reports the supported range of values for the **<status>** parameter.
Example	AT# SWMDEPLOYDP =1 OK (after device reboot) #SWMRING: 4,"description of update package","Release Note URL"

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6. 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
DGPS	Differential GPS, the use of GPS measurements, which are differentially corrected
DNS	Domain Name System
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Fraquency
DTR	Data Terminal Ready
GGA	GPS Fix data
GLL	Geographic Position – Latitude/Longitude
GLONASS	Global positioning system maintained by the Russian Space Forces
GMT	Greenwich Mean Time
GNSS	Any single or combined satellite navigation system (GPS, GLONASS and combined GPS/GLONASS)
GPRS	Global Packet Radio Service
GPS	Global Positioning System
GSA	GPS DOP and Active satellites
GSM	Global System Mobile
GSV	GPS satellites in view
HDLC	High Level Data Link Control
HDOP	Horizontal Dilution of Precision
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IRA	International Reference Alphabet
IWF	Interworking Function
ME	Mobile Equipment
MO	Mobile Originated

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MT	*either* Mobile Terminated *or* Mobile Terminal
NMEA	National Marine Electronics Association
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
WAAS	Wide Area Augmentation System

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6.1. Document history

Revision	Date	SW release	Changes
ISSUE #0	2011-05-10	12.00.000-B001	Initial release
ISSUE #1	2011-09-30	12.00.xx1	Update to the correct sw release label
ISSUE#2	2011-12-01	Internal version	
ISSUE#3	2012-03-01	12.00.xx2	Updated commands: #AUTOBND, #BND, #EMAILD, #ENS, #MONI, #NITZ, #RFSTS, #SCFGEXT2, #SKTD, #SSEND, &D, +CBST, +CGACT, +CGEQMIN, +CGEQREQ, +CGREG, +CLCK, +CMER, +CMUX, +CNMA, +COLP, +CREG, +CSIM, +CSMS, +CSQ, +IPR, $GPSSW, #BASE64, #BND, #CFF, #EVMONI, #FTPAPP, #FTPPUT, #SLED, #SNUM, #STARTMODESCR, +CMUX, +CNMI, +CNUM, +CPBF, +CPBR, +CPBW, +CRLP, +CSQ, +PACSP New commands: +CNMA, +CBST, #TTY, #SIMDET, #RXDIV, #PSNT, #PSMRI, #PORTCFG, #I2C, #GAUTH, #FTPAPPEXT, #ENCALG, #DVIEXT, #DVI, #ACAL, #ACALEXT, +CVHU, #ADC, #BIQUADIN, #BIQUADINEX, #BIQUADOUT, #BIQUADOUTEX, #CPBD, #DTMF, #DVI, #DVIEX, #ENCALG, #GAUTH, #NWEN, #PORTCFG, #PRST, #PSAV, #PSEL, #PSNT, #RXDIV, #SIMPR, #SPCM, #SSENDUDP, #SSENDUDPEXT, #TTY, +CFUN, +CMMS, +CPBS, +CSTA, +CSVM, #STIA, #STGI, #STSR, #STTA, $GPSP, $GPSR, $GPSNMUN, $GPSACP, $GPSSAV, $GPSRST, $GPSNVRAM, $GPSQOS, $GPSSLSR, $GPSSTOP, $LCSSLP, $LCSLUI, $LCSTER, $LICLS, $LCSLRMT, $LCSLRV, $LTC, $LCSLK
ISSUE#4	2012-07-02	12.00.xx3	Updated commands: #AUTOBND, #BND, #CODEC, #CODECINFO, #DVI, #DVIEXT, #ENS, #EVMONI, #FTPGETPKT, #GPIO, #I2CWR, #MONI, #PING, #PORTCFG, #PSMRI, #RXDIV, #SCFGEXT, #SPCM, #SRECV, #STIA, #TCPATCONSER, #GPSACP, #GPSQOS, #GPSR, #GPSSTOP, $LTC, +CBST, +CFUN, +ATA, +ATD, +ATO, +ATS0, #ENHRST, #GAUTH, &D,#SERVINFO, +CSMP, #FTPAPP, #FTPPUT, #SD, #SL, #SKTSET, #SKTD, #SKTL, #SGACT New commands: +ICF, +IFC, #ALARMPIN, #CFLO , #FTPCFG, #TEMPMON

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ISSUE#5	2013-07-01	12.00.xx4	Added UE910 family Updated Chapters: 1.4, 3.2, 3.2.2.2, 3.3.1, 4, 5.1.3.6 #VAUX, #VAUXSAV, $GPSSW removed Updated AT Command's descriptions: #DNS, #DVI, #DVIEXT, #ENCALG, #MONI, #SH, #SPCM, #WAKE, #WSCRIPT, $GPSSLSR, &D, +CGEQNEQ, +CSSN, ATS25, #FTPCFG, #QSS, #TEMPMON, $GPSACP, $LCSLK, $LCSSLP, $LCSTER, $LICLS, $LTC, +CCLK, #CCLK , +CFUN Existing AT Commands updated from 12.00.xx4: #CODECINFO, #ENAEVMONICFG, #EVMONI, #GPIO, #MSCLASS, #PORTCFG, #PSNT, #RFSTS, #SCFG, #SCFGEXT2, #SMSATRUNCFG, #SS, #TCPATRUNCFG, +CPBR, +CPBW, +CPBF , +CPBS, +CPMS, #SSLSECCFG, +CGDCONT New AT Commands supported from 12.00.xx4: #ANAMICG, #ATDELAY, #CCLKMODE, #DIGMICG, #E2ESC, #ECHOCFG, #JDR, #NCIH, #OTASNAP, #OTASUAN, #OTASETRI, #OTAIPCFG, #OTAIPUPD, #OTASNAPIP, #OTASNAPIPCFG, #SCFGEXT3, #SLASTCLOSURE, #SMSMOVE, #SSLCFG, #SSLD, #SSLEN, #SSLH, #SSLO, #SSLRECV, #SSLS, #SSLSECCFG, #SSLSECDATA, #SSLSEND, #HTTPCFG, #HTTPQRY, #HTTPSND, #HTTPRCV, #CPBGR, #CPBGW, #DAC, #NWDNS, #SMSMODE, AT#ECALL, AT+CECALL, AT#EMRGD, AT#MSDPUSH, AT#MSDSEND, #OAP
ISSUE#6	2014-02-05	12.00.xx4	Updated title and applicability table with UL865 family modules
ISSUE#7	2014-02-24	12.00.xx5	Par.3.3.1 update Update commands: +CGDCONT, +CLCK, +COPS, +CSQ, +CSVM, +CUSD, +CCID +W46, ATO, #CODEC, #ENAEVMONICFG, #EVMONI, #JDR, #LCSRIPT, #MONI, #SCFGEXT3, #SHSSD, #SMSATRUNCFG, #SS, #STIA, #STGI, #STSR, #TCPATRUNCFG, #HTTPCFG, #HTTPRCV, #ECHOCFG, #DIALMODE, #ATDELAY, #QDNS, HSMICG, #DVI, #GPIO, #GSMCONT, #DVICLK,#SKIPESC New commands: ATS2, ATS12, \Q, #CHUP, #FILEPWD,

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			#ENACONSUME, #CONSUMECFG, #BLOCKCONSUME, #STATSCONSUME, #IPCONSUMECFG, #SSENDLINE, #MONIZIP, #UDUB, #DTMFCFG, #TESTMODE, #ESMTPORT, #FPLMN, #GPPPCFG, #SCT, #SCI, #WCDMADOM, #SECCFG
ISSUE#8	2015-01-13	12.00.xx6	Remove HE910-GA in applicability table. Par3.3.1 Updated commands: #ANAMICG, #DIGMICG, #GPIO, $GPSAV, $GPRST, $GPSNMUN, $GPSACP, $GPSR, #SIMDET, #ENCALG, #SIMDET, #HTTPCFG, #SSLD, #SSLDECCFG, #SSLSECDATA, #SSLSEND, #SSLS, #SSLD, #SSLCFG, #JDR, #PORTCFG, +CPIN, #SD, #SL, #TESTMODE, #SSLRECV, #FPLMN, #GPPPCFG, #SSLRECV, +CGACT, +CFUN, #MONIZIP, #RSCRIPT , #SMOV New commands: #SIEXT, $EPATCH, $DPATCH, $WPATCH, $LPATCH, $GPSSTAGPS, $GPSCON, $GPSPS, $GPSSP, $GPSIFIX, $GPSGPIO, $GPSP, $GPSAT, $GPSSW, $GPSWK, $GPSSERSPEED, $INJECTSTSEED, $FTPGETIFIX, $HTTPGETIFIX, HTTPGETSTSEED, #SYSHALT, #TEMPCFG, #FRWLIPV6, #SSLSENDEXT, #JDRENH2, #USBCFG, #CSURV, #DLINK, #ECM, #ECMC, #ECMD, #SIMINCFG, #E2RI, #CIPHIND, +IMEISV, #AESSECDATA, #AESENCRYPT, #AESDECRYPT, #AESDECRYPT, #AESGETRESULT, #DWCFG, #DWCONN, #DWSTATUS, #DWSEND, #DWSENDR, #DWRCVR, #DWRCV, #DWLRCV, #DWEN, #FDOR, #RXTOGGLE
ISSUE#9	2015-04-03	12.00.xx6	Updated paragraph titles and notes added to the following commands: AT#SMSATWL, AT#FRWL, AT#TCPATRUNFRWL, AT+CLCK
ISSUE#9	2015-05-15	12.00.xx6	New document title. Updated applicability table and AT commands availability table, introducing new product variants (HE910-GL, UE910-N3G, UL865-N3G V2, UE866-N3G). Updated
ISSUE#10	2015-10-26	12.00.xx7	Updated AT Commands Availability Table (Par. 4). Updated commands:

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			#CMUXMODE, #DWCFG, AT#QSS, #SIMINCFG, #STTA, #TESTMODE, #UDTSET, #V24CFG, $EPATCH, $FTPGETIFIX, $GPSACP, $GPSD, $GPSGPIO, $GPSNMUN, $GPSP, $GPSR, $HTTPGETIFIX, +CSIM, #SIMDET, +CSQ New commands: #APPSKTCFG, #DASCRIPT, #ECALLNWTMR, #ECALLTMR, #ECALLURC, #ECONLY, #MSDREAD, #NTP, #REGIND, #SMTPCFG, #SSLI, #STACFG, +CCHO, +CCHC, +CGLA, #ASIZE, #ALIST, #ADELF, #ADELA, #ASEND, #ARECV, #ARECD, #ACONF, #APLAY, #SWMENA, #SWMCFG, #SWMBOOTSTRAP, #SWMREG, #SWMCHKUPD, #SWMGETDP, #SWMDEPLOYDP

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