LE910Cx

AT Commands Reference Guide

80502ST10950A Rev. 14 – 2022-03-04

Telit Technical Documentation

APPLICABILITY TABLE

PRODUCTS
LE910Cx

SOFTWARE
25.21.xx2
25.30.xx4

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1. INTRODUCTION

1.1. Scope

This document is aimed to provide a detailed specification and a comprehensive listing for reference for the entire AT command set.

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 technical support and general questions please e-mail:

- *TS-EMEA@telit.com*
- *TS-AMERICAS@telit.com*
- *TS-APAC@telit.com*
- *TS-SRD@telit.com*
- *TS-ONEEDGE@telit.com*

Alternatively, use:

https://www.telit.com/contact-us/

Product information and technical documents are accessible 24/7 on our web site:

https://www.telit.com

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1.4. Symbol Convention

Danger: This information MUST be followed or catastrophic equipment failure or personal injury may occur.

Warning: Alerts the user on important steps about the module integration. If these points are not followed, the module and end user equipment may fail or malfunction.

Note/Tip: This section provides all information related to the AT command involved. Each note can provide a different level of information: danger, caution/warning and tip/information.

Note/Tip: Provides other advices and suggestions.

Note/Tip: Provides advice and suggestions that may be useful when integrating the module.

Electro-static Discharge: Notifies the user to take proper grounding precautions before handling the product.

Set: This section provides all information related to SET functionality of the AT command involved. If there is strictly and relevant SET information, it can be found at the end of the section.

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	Read: This section provides all information related to READ functionality of the AT command involved. If there is strictly and relevant READ information, it can be found at the end of the section.
	Test: This section provides all information related to TEST functionality of the AT command involved. If there is strictly and relevant TEST information, these can be found at the end of the section.
	Additional info: This section provides any kind of additional and useful information related to the AT command section as well as command exceptions or special behavior cases
	Reference: This section provides useful references (standards or normative) related to the AT command involved.
	Example: This section provides useful examples related to the AT command involved.

Table 1: Symbol Conventions

All dates are in ISO 8601 format, that is. YYYY-MM-DD.

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2. COMMANDS

The Telit family of wireless modules can be controlled via the serial interface using the standard AT commands. It complies with:

1. Hayes standard AT command set, 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, the Telit family of wireless modules also supports Telit proprietary AT commands for special purposes.

The following is a description of how to use the AT commands with the Telit family of wireless modules.

Note: 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.

2.1. Definitions

The following syntactic definitions apply:

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

<LF> **Linefeed character**, is the character recognized as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter S4. The default value is 10. The line feed character is output after the carriage return character if detailed 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 syntactic element. They are not displayed on the command line.

[...] The optional sub parameter of a command or an optional part of the TA information response is enclosed in square brackets. The brackets themselves are not

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displayed on the command line. When the sub parameter is not given in AT commands that have a Read command, new value is equal to its previous value. In AT commands that do not store the values of any of their sub parameters, and therefore do not have a Read command, which are called *action type* commands, an action should be performed according to the recommended default setting of the sub parameter.

2.2. 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:

1. **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 stored values), or "tested" (to determine ranges of values supported). Each of them has a test command (trailing **=?**) to provide information about the type of its sub parameters; they also have a Read command (trailing?) to check the current values of sub parameters.
2. **Action type commands**. This type of command may be "executed" or "tested".
    1. "executed" to invoke a function of the equipment, which generally involves more than the simple storage of a value for later use
    2. "tested" to determine:
        1. if sub parameters are associated with the action, the ranges of sub parameters values that are supported; if the command has no sub parameters, issuing the correspondent Test command (trailing **=?**) raises the result code "**ERROR**".
           Note: issuing the Read command (trailing?) causes the command to be executed.
        2. whether the equipment implements the Action Command or not (in this case issuing the correspondent Test command - trailing **=?** - returns the **OK** result code), and, if sub parameters are associated with the action, the ranges of sub parameters values that are supported.

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

Moreover:

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

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

2.2.1. String Type Parameters

A string, either enclosed between quotes or not, is 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 must 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 always requires to write the input string parameters in quotes: this is explicitly reported in the specific descriptions.

2.2.2. 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:

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

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Note: The set of proprietary AT commands differs 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.

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

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

however, it is always preferable to separate basic and extended commands in different command lines; furthermore, it is recommended 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 claim which one of them has failed the execution.

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

2.2.2.1. 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>**

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

Note: "**Numeric Format**" Not all modules support the error codes shown in the table

Note: "**Verbose Format**" There could be small variations in the message depending on the module in use

Numeric Format	Verbose Format
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
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full

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Numeric Format	Verbose Format
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 timeout
32	network not allowed - emergency calls only
34	numeric parameter instead of text parameter
35	text parameter instead of numeric parameter
36	numeric parameter out of bounds
37	text string too short
38	The GPIO Pin is already used
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
49	EAP method not supported
50	Invalid EAP parameter

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Numeric Format	Verbose Format
51	Parameter length error for all Auth commands
52	Temporary error for all Auth command
53	not verified hidden key
100	unknown
103	Illegal MESSAGE
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
257	network rejected request
258	retry operation
259	invalid deflected to number
260	deflected to own number
261	unknown subscriber
262	service not available
263	unknown class
264	unknown network message

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Numeric Format	Verbose Format
273	Minimum TFT per PDP address error
274	Duplicate TFT eval prec index
275	Invalid TFT param combination
277	Invalid number of parameters
278	Invalid Parameter
320	Call index error
321	Call state error
322	Sys state error
323	Parameters error
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	can not setup socket
558	can not resolve DN
559	time-out in opening socket
560	can not open socket
561	remote disconnected or time-out
562	connection failed
563	tx error

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Numeric Format	Verbose Format
564	already listening
565	socket disconnection
566	can not resume socket
567	ip version type incompatible
568	ipv6 not enabled
569	
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
612	Resource used by other instance
613	Data socket yet opened in cmdmode
614	FTP CmdMode data socket closed
615	FTP not connected
616	FTP disconnected
617	FTP read command closed
618	FTP read command error
619	FTP write command closed

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Numeric Format	Verbose Format
620	FTP write command error
621	FTP read data closed
622	FTP read data error
623	FTP write data closed
624	FTP write data error
625	FTP host not found
626	FTP accept failure
627	FTP listen failure
628	FTP bind failure
629	FTP file create failure
630	FTP file get failure
631	FTP file put failure
632	FTP file not found
633	FTP timed out
634	FTP login incorrect
635	FTP close error
636	FTP server not ready
637	FTP server shutdown
638	FTP unexpected reply
639	FTP user ID and password don't match
640	FTP user ID and password don't match
641	FTP user already logged in
642	FTP open channel timeout
643	FTP communication timeout
644	FTP unknown error
657	Network survey error (No Carrier)

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Numeric Format	Verbose Format
658	Network survey error (Busy)
659	Network survey error (Wrong request)
660	Network survey error (Aborted)
680	LU processing
681	Network search aborted
682	PTM mode
683	Network search terminated
684	CSG Search processing
690	Active call state
691	RR connection established
770	SIM invalid
900	No Response for AT Command
1000	SSL not activated
1001	SSL certs and keys wrong or not stored
1002	SSL generic error
1003	SSL already activated
1004	SSL error during handshake
1005	SSL socket error
1006	SSL invalid state
1007	SSL cannot activate
1008	SSL not connected
1009	SSL already connected
1010	SSL error enc/dec data
1011	SSL disconnected

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Numeric Format	Verbose Format
1100	Model not recognized
1101	Model information missing
1102	Unable to open the file
1103	Unable to close the file
1104	Unable to read the nv file
1105	Unable to write the nv file
1106	Input pattern is wrong
1113	Call establishment failed
1114	File name already exist

Table 2: ME Error Result Code

2.2.2.2. 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
According to 3GPP TS 24.011 section 8.2.5.4	
0...127	
According to 3GPP TS 23.040 sub clause 9.2.3.22 values	
128...255	
According to 3GPP TS 27.005 section 3.2.5 - Message Service Failure Result Code +CMS ERROR	
300	ME failure

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Numeric Format	Meaning
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
510	msg blocked
<err> 512 and on are manufacturer specific	
512	No SM resources
513	TR1M timeout
514	LL error

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Numeric Format	Meaning
515	No response from network

Table 3: Message Service Failure Result Code

2.2.3. 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:

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

Moreover, there are two other types of result codes:

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

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

Numeric form	Verbose form
0	OK
1	CONNECT or CONNECT <text>
2	RING
3	NO CARRIER
4	ERROR
6	NO DIALTONE
7	BUSY
8	NO ANSWER
10	CONNECT 2400
11	CONNECT 4800
12	CONNECT 9600

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15	CONNECT 14400
23	CONNECT 1200/75

Table 4: basic result codes

Note: <text> can be"300", "1200", "2400", "4800", "9600", "14400" or "1200/75"

2.2.4. Command Response Time-Out

Every command issued to the Telit modules returns a result response, if response codes are enabled (default). The time required to process the given command and return the response varies, depending on the command type. The Commands that do not interact with the SIM or the network, and only involve internal setups or readings, have an immediate response. The Commands that interact with the SIM or the network may take several seconds to send a response, depending on the SIM configuration (for example, number of contacts stored in the phonebook, number of stored SMS), or on the network the command may interact with.

2.2.5. Command Issuing Timing

The chain Command -> Response must always be respected, and a new command must not be issued before the module has finished all the ending of the response result code (whatever it is).

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.

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

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

2.3. Storage

2.3.1. Factory Profile and User Profiles

The Telit wireless modules store the values, set by several commands, in the internal non-volatile memory (NVM), allowing to remember this setting even after power off. In

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NVM, these values are set either as factory or 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 the factory profile.

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

The **&W** command is used to save the current values of both profile sections 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.

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

In this document, each AT command description begins with an "AT Command short overview table" in the following format:

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
/	see below	/	/	/

Table 5: AT Command short overview table

This chapter focuses on the values that the **saved Setting** field can have and their meaning. The meaning of the other fields will be described in the next chapter. The **saved Setting** field can have one of the values listed below (for information about the AT instance introduced hereafter, see the reference section of the **#PORTCFG** command):

Specific profile the parameters values set by the command are stored in the profile base section. The stored values set is associated to the specific AT instance used to enter the command. It is a profile used by the specific AT instances.

Examples of the AT commands: **+IPR**, **E**, **Q**, **V**, **X**, **&Y**, etc.

The parameters values set by the command are stored in the profile extended section. The stored values set is associated to the specific AT

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instance used to enter the command. It is a profile used by the specific AT instance.

Examples of the AT commands: **+FCLASS**, **+CREG**, **+CLIP**, **#STIA**, etc.

Common profile the parameters values set by the command are stored in the profile extended section. The stored values set is not associated to the specific AT instance used to enter the command. It is a profile shared between the AT instances.

Examples of the AT commands: **+CALM**, **#E2SLRI**, **#DVI**, etc.

Auto the parameters values set by the command are automatically stored in NVM, without issuing any storing AT command, and regardless of the profile (unique values). The values are automatically restored at startup.

AT commands examples: **+COPS**, **+CGQREQ**, **#SCFG**, etc.

In some cases, the parameters values are stored in the file system.

AT commands examples: **#TEMPCFG**, **#TEMPMON**, etc.

Other the parameters values set by the command are stored in NVM by issuing a specific command and regardless of the profile.

Examples of the AT commands:

#SLED setting is saved by **#SLEDSAV**

#BIQUADINEX setting is saved by **#PSAV**

etc.

2.4. AT Command Short Overview Table

As stated before, each AT command description begins with an "AT Command short overview table" having the following format:

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	/	No	-	2

Table 6: AT Command short overview table

Here are the table fields meanings:

SIM Presence indicates if the AT command to be executed needs the SIM presence.

Can be aborted indicates if the AT command can be aborted during its execution.

MAX timeout indicates the time within which the command must be executed.

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SELINT indicates on which AT interface type the AT command is available.

2.5. AT Commands Availability Table

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
Call & DTMF																			
AT+CHUP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CSTA	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+FCLASS	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#ACAL	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#ACALEXT	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#ECAM	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#ECAMURC	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#CFF	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#CESTHLCK	•		•	•	•	•	•							•			•		
AT+VTS	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+VTD	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CMOD	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#CODECIMS	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#ECTD	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CSNS	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CRC	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CVHU	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CBST	•	•	•	•	•	•	•				•	•		•			•	•	
AT+CRLP	•	•	•	•	•	•	•				•	•		•			•	•	
AT#NCIH	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
General Control and Config																			
Command Line Prefixes																			
AT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
A/	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#/	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Generic Modem Control																			

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AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#SELINT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&F	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATZ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&Y	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&W	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#Z	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&V	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT\V	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+GCI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT%L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT%Q	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+GCAP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+GMI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+GMM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+GMR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CEER	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+GSN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGMI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGMM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGMR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGSN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CGMI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CGMR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CGSN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CGMF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SWPKGV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPAS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CFUN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CIND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMER	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CACM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CAMM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPUC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CCWE	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CSVM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#MBN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#MWI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CLAC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#LANG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMEE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CEERURC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#OVERRIDEPDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ENSSHD	•	•	•	•	•	•	•				•	•							
AT#HWREV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TRACE	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#DHCPV6DELEGATION					•									•			•	•	
AT#PSMRI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSCS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSCSEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+PACSP	•			A						•	•	A	•			•	A	A	•
AT+CMUX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CMUXMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#USBCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EXCEPINFO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RESETINFO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PORTCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ATDELAY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&Z	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&V2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&N	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#IMEISV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&V0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FWSWITCH		•	•	•			•					•					•	•	
AT#FWAUTOSIM		•	•	•			•					•					•	•	
AT#SECIFCFG	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#SECIFAUTH	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#SECIFPWD	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#CLATENA	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#CQI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FRATTRIGGER	•			A						•	•	A	•			•	•	•	•
AT#PDPAUTH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TXCAL	•				•	•	•				•			•			•	•	
AT#TXCAL4G	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#CIND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TID														•	•	•	•	•	•
AT+IMEISV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CGMM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#IMSPDPSET	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FWTDEVICESET				•				•				•			•				
AT#WKIO	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#CDORM	•	•	•	•	•	•	•				•	•		•			•	•	
AT#CMAR														•	•	•	•	•	•
S Parameters																			
ATS0	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
ATS1	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
ATS2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS30	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATS38	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&V1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&V3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
DTE – Modem Interface Control																			
ATE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATQ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&D	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT\Q	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+IPR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DTR														•	•	•	•	•	•
AT+FLO	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•

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AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT+IFC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+ICF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CFLO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKIPESC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#E2ESC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#KIPR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NOPT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NOPTEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+ILRR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT\K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT\R	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT\B	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT\N	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Call Control																			
ATD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
ATO	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
ATT	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT&G	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT&Q	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CHSN	•	•	•	•	•	•	•				•	•		•			•	•	
ATA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DIALMODE	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#CALLDISA	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
Modulation Control & Compression Control																			
AT%E	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+DS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+DR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Jammed Detection & Report																			
AT#JDRENH2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#JDRGNSS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#JDR4GCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Network																			
AT+CNUM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+COPN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CREG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT+CLCK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPWD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CLIR	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+COLP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CHLD	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CTFR	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CUSD	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CAOC	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CLCC	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CSSN	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CCUG	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CPOL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CODECINFO	•		•	•	•	•	•							•			•		
AT+CPLS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSQ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SERVINFO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NWEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#BCCHLOCK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PLMNMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FPLMN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CODEC	•		•	•	•	•	•							•			•		
AT#BND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#AUTOBND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SNUM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PSNT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ENCALG	•		•	•	•	•	•				•	•		•			•	•	
AT+CEMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPNER	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CESQ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ENS	•			A						•	•	A	•			•	A	A	•
AT+WS46	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CEDRXS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CEDRXRDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CEREG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RFSTS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SPN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CHBHCID	•	•	•	•	•	•	•				•	•							
AT#LTEULOOS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#ALLOWHAC	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#MONI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#BRCSFB	•				•	•	•				•			•			•	•	
AT#BNDRAM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SELBNDMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GTUNEANT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SDOMAIN	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#NWSCANTMR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NASC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CDIP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CLIP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+COLR	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CCFC	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CCWA	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+VZWRSRP				V				•				V			•				
AT+VZWRSRQ				V				•				V			•				
AT+COPS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#REJER	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#LTESFN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CIPHIND	•		•	•	•	•	•				•	•		•			•	•	
AT#CLSMK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CRAC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RPMCFG	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#RPMCFGEXT	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#CEERNET	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#MANAGEROAM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RATORDER	•	•	•	•	•	•	•	•	•	•	•	•	•						
Phonebook																			
AT+CPBS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPBR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPBF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPBW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CPBGR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CPBGW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CPBD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CPBE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SMS & CB																			
AT+CSMS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT+CPMS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSCA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSMP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSDH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSCB	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSAS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CRES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMMS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGSMS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CNMI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CNMA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMSS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CMGD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMSMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CMGS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CMGW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CMGLCONCINDEX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#E2SMSRI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMOV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMSMOVE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMSUCS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ISMSCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Time & Alarm																			
AT+CCLK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CALA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSDF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CTZU	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CTZR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CCLK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CCLKMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CLKSRC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#WAKE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT+CSTF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CALD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NITZ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
WLAN																			
AT#WLANSTART	•	•	•	•	•	•	•				•	•							
AT#WLANBROADCAST	•	•	•	•	•	•	•				•	•							
AT#WLANSSID	•	•	•	•	•	•	•				•	•							
AT#WLANMODE	•	•	•	•	•	•	•				•	•							
AT#WLANIP	•	•	•	•	•	•	•				•	•							
AT#WLANSIGNAL	•	•	•	•	•	•	•				•	•							
AT#WLANSCAN	•	•	•	•	•	•	•				•	•							
AT#WLANCONNECT	•	•	•	•	•	•	•				•	•							
AT#WLANDISCONNECT	•	•	•	•	•	•	•				•	•							
AT#WLANCONFIG	•	•	•	•	•	•	•				•	•							
AT#WLANEAPCFG	•	•	•	•	•	•	•				•	•							
AT#WLANEAPCERT	•	•	•	•	•	•	•				•	•							
AT#WLANCFGERROR	•	•	•	•	•	•	•				•	•							
AT#WLANINDI	•	•	•	•	•	•	•				•	•							
AT#ISEL	•	•		•	•		•				•	•							
AT#WLANBD	•	•	•	•	•	•	•				•	•							
AT#WLANICMP	•	•	•	•	•	•	•				•	•							
AT#WLANPING	•	•	•	•	•	•	•				•	•							
AT#WLANAPCLIND	•	•	•	•	•	•	•				•	•							
AT#WLANCMIFSEL	•	•	•	•	•	•	•				•	•							
AT#WLANAPCLIST	•	•	•	•	•	•	•				•	•							
AT#WLANCLOCK	•	•	•	•	•	•	•				•	•							
AT#WLANMODULE	•	•	•	•	•	•	•				•	•							
AT#WLANDFS	•	•	•	•	•	•	•				•	•							
AT#WLANMACMODE	•	•	•	•	•	•	•				•	•							
AT#CONNMGRSTART	•	•	•	•	•	•	•				•	•							
AT#WLANSECURITY	•	•	•	•	•	•	•				•	•							
AT#WLANMACACCEPT	•	•	•	•	•	•	•				•	•							
AT#WLANMACDENY	•	•	•	•	•	•	•				•	•							
AT#WLANCOUNTRYCODE	•	•	•	•	•	•	•				•	•							
AT#WLANMAC	•	•	•	•	•	•	•				•	•							
AT#WLANPC	•	•	•	•	•	•	•				•	•							
Packet domain																			
AT#SWITCHATTPROF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#DUALAPN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGCLASS	•		•	•	•	•	•				•	•		•			•	•	
AT#LABIMS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGQREQ	•	•	•	•	•	•	•				•	•		•			•	•	
AT+CGDCONT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGCONTRDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#IMSSETTING	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGQMIN	•	•	•	•	•	•	•				•	•		•			•	•	
AT+CGEQREQ	•	•	•	•	•	•	•				•	•		•			•	•	
AT+CGEQNEG	•	•	•	•	•	•	•				•	•		•			•	•	
AT+CGPADDR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGCMOD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#AUTOATT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#MSCLASS	•				•	•	•				•			•			•	•	
AT#IMSUA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GAUTH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GPPPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGEQMIN	•	•	•	•	•	•	•				•	•		•			•	•	
AT+CGEQOS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGPIAF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CEVDP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CGEREP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGATT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGTFT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGDATA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGEQOSRDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGTFTRDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PPPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGACT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGDSCONT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGSCONTRDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGREG	•	•	•	•	•	•	•				•	•		•			•	•	
AT#SINGLEAPNSWITCH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SIM																			
AT+CPIN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CPINR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PCT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+ICCID	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT+CIMI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CIMI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SIMDET	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CRSM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CSIM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CCHO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CCHC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CGLA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CUAD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CCID	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SIMPR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#QSS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SIMSELECT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RSEN	•	•	•	•	•	•	•				•	•							
AT#ENSIM2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#HSEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SIMINCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMID	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMPF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMPFINFO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMUPN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMGETADDR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMCAP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMPFUC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMADDPF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESIMMEMRST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#VSIMSETPROF														•	•	•	•	•	•
AT#VSIMLISTPROF														•	•	•	•	•	•
SIM Toolkit																			
AT#STIA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#STGI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#STSR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SDM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#STIME	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#STKENV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Audio - Audio Basic Configuration																			
AT+CALM	•	•	•	•	•	•	•	•	•	•									
AT+CRSL	•	•	•	•	•	•	•	•	•	•									

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT+CLVL	•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	
AT+CMUT	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT+CSIL	•	•	•	•	•	•	•	•	•	•									
AT#CAP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#SRP	•	•	•	•	•	•	•	•	•	•									
AT#SHFSD	•	•	•	•	•	•	•	•	•	•									
AT#SHSSD	•	•	•	•	•	•	•	•	•	•									
AT#SPKMUT	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#OAP	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#SRS	•	•	•	•	•	•	•	•	•	•									
AT#SRSEXT	•	•	•	•	•	•	•	•	•	•									
AT#HSGS	•	•	•	•	•	•	•	•	•	•									
AT#HFRECG	•	•	•	•	•	•	•	•	•	•									
AT#HSMICG	•	•	•	•	•	•	•	•	•	•									
AT#HSRECG	•	•	•	•	•	•	•	•	•	•									
AT#HFMICG	•	•	•	•	•	•	•	•	•	•									
Audio - Tones configuration																			
AT#STM	•	•	•	•	•	•	•	•	•	•									
AT#TONE	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#TSVOL	•	•	•	•	•	•	•	•	•	•									
AT#SMSVOL	•	•	•	•	•	•	•	•	•	•									
AT#OOBTSET	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
Audio - Audio profiles																			
AT#PRST	•	•	•	•	•	•	•	•	•	•									
AT#PSAV	•	•	•	•	•	•	•	•	•	•									
AT#PSET	•	•	•	•	•	•	•	•	•	•									
AT#ADSPC	•	•	•	•	•	•	•	•	•	•									
AT#AUSBC	•	•	•	•	•	•	•	•	•	•									
AT#PSEL	•	•	•	•	•	•	•	•	•	•									
Echo Canceller Configuration																			
AT#SHSEC	•	•	•	•	•	•	•	•	•	•									
AT#SHFEC	•	•	•	•	•	•	•	•	•	•									
AT#SHFNR	•	•	•	•	•	•	•	•	•	•									
AT#SHSNR	•	•	•	•	•	•	•	•	•	•									
Embedded DTMF Decoder & TTY																			
AT#DTMF	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#TTY	•	•	•	•	•	•	•	•	•	•									
Digital Voice Interface																			

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#DVI	•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•
AT#DVIEXT	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#DVICFG	•	•	•	•	•	•	•	•	•	•									
AT#DVICLK	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#PCMRXG	•	•	•	•	•	•	•	•	•	•									
AT#PCMDELAY	•	•	•	•	•	•	•	•	•	•									
Audio File Management																			
AT#ACDB	•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•
AT#ASEND	•	•	•	•	•	•	•	•	•	•									
AT#ARECD	•	•	•	•	•	•	•	•	•	•									
AT#APLAY	•	•	•	•	•	•	•	•	•	•									
AT#ALIST	•	•	•	•	•	•	•	•	•	•									
AT#ASIZE	•	•	•	•	•	•	•	•	•	•									
AT#ADELF	•	•	•	•	•	•	•	•	•	•									
AT#ADELA	•	•	•	•	•	•	•	•	•	•									
AT#ACDBEXT	•	•	•	•	•	•	•	•	•	•									
eCall																			
AT+CECALL	•		•	•	•						•	•							
AT#ECALL	•		•	•	•						•	•							
AT#EMRGD	•		•	•	•						•	•							
AT#MSDPUSH	•		•	•	•						•	•							
AT#MSDSEND	•		•	•	•						•	•							
AT#MSDREAD	•		•	•	•						•	•							
AT#ECALLNWTMR	•		•	•	•						•	•							
AT#ECALLTMR	•		•	•	•						•	•							
AT#ECONLY	•		•	•	•						•	•							
AT#ECALLURC	•		•	•	•						•	•							
Power Down																			
AT#REBOOT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ENHRST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SHDN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SYSHALT														•	•	•	•	•	•
AT#FASTSHDN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
HW and Radio Control																			
AT#ETHMAC				•	•	•						•							
AT#ETHCFG	•	•	•	•	•	•	•				•	•							
AT#ETHIP	•	•	•	•	•	•	•				•	•							
AT#ETHMODE	•	•	•	•	•	•	•				•	•							

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#ETHSTATUS	•	•	•	•	•	•	•				•	•							
AT#ETHEN	•	•	•	•	•	•	•				•	•							
AT#USBZLPDIS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+CBC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TEMPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GPIO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ALARMPIN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SLED	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SLEDSAV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SWREADYEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ADC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#V24CFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#V24	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#I2CWR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#I2CRD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#I2CCF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SPIEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SPICFG	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#HSICEN	•	•	•	•	•	•	•				•	•							
AT#RXDIV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GSMAD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#VAUX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#VAUXSAV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TEMPMON	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#QTEMP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TESTMODE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#STUNEANT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RXTOGGLE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CBC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKIPGCF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mobile Broadband - ECM																			
AT#ECM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ECMC	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#ECMD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RNDIS	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#RNDISC	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#RNDISD	•	•	•	•	•	•	•	•	•	•	•	•	•						
IPEasy																			

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#SGACT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SGACTCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SGACTCFGEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GPRS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CGPADDR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SCFGEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SCFGEXT2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SCFGEXT3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTRST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SLUDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#USERID	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SLASTCLOSURE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PADFWD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PADCMD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#E2SLRI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ICMP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PING	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#QDNS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NTP	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#NTPCFG	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#PROTOCOLCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#GDATAVOL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PASSW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SGACTAUTH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PKTSZ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DSTO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTCT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTOP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTSET	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SRECV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#SSENDUDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSENDUDPEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#BASE64	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DNS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CACHEDNS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSEND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSENDEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FRWL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTSAV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SKTTO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#NWDNS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPREASS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPMAXDAT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPMAXWIN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SIOWATERMARK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
FTPEasy																			
AT#FTPAPP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPAPPEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPCLOSE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPCWD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPDELE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPFSIZE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPGET	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPGETPKT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPMSG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPOPEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPPUT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPPWD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPRECV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPREST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPTO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPTYPE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPLIST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#FTPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SMTP																			

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#ESMTP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#APPSKTCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SEMAIL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EMAILACT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMTPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EADDR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ERST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EMAILMSG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EUSER	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ESAV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EMAILPDPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EPASSW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EMAILD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
HTTP																			
AT#HTTPCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#HTTPSND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#HTTPRCV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#HTTPQRY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SSL																			
AT#SSLCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLSECCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLSEND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLRECV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLSECDATA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLSECCFG2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLSECDATAEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SSLSENDEXT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Easy Scan																			
AT#CSURV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVNLF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#CSURVU	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVUC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVB	•		•	•	•	•	•				•	•		•			•	•	
AT#CSURVBC	•		•	•	•	•	•				•	•		•			•	•	
AT#CSURVP	•		•	•	•	•	•				•	•		•			•	•	
AT#CSURVPC	•		•	•	•	•	•				•	•		•			•	•	
AT#CSURVL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVCL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#CSURVW	•		•	•	•	•	•				•	•		•			•	•	
AT#CSURVCW	•		•	•	•	•	•				•	•		•			•	•	
AT#CSURVG	•				•	•	•				•			•			•	•	
AT#CSURVCG	•				•	•	•				•			•			•	•	
AT#MCSGS	•	•	•	•	•	•	•	•	•	•				•	•	•	•		
AT#CSURVEXT	•				•	•	•				•			•			•	•	
AT Run																			
AT#SMSATRUN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMSATRUNCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#SMSATWL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATRUNCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATRUNFRWL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATRUNAUTH	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATRUND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATRUNCLOSE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATCMDSEQ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATCONSER	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ATRUNDELAY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#TCPATRUNL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Event Monitor																			
AT#ENAEVMONI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#ENAEVMONICFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#EVMONI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IoT Portal																			
AT#DWCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWSEND	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWSENDR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWRCV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWLRCV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWSTATUS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#DWCONN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWRCVR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DWEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#LWM2MSKIP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT+ODIS	•			A						•	•	A	•			•	•	•	•
AT#FOTAURC														•	•	•	•	•	•
FOTA & OMA - FOTA Legacy																			
AT#OTAUPW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
FOTA & OMA - OMA-DM																			
AT#HOSTODIS	•			A						•	•	A	•			•	•	•	•
AT#VZWFOTAURC				V				•				V							
AT#VZWDM				V				•				V							
AT#VZWSENDUA				V				•				V							
AT#VZWDMACCURL				V				•				V							
AT#VZWFOTACFG				V				•				V							
M2M																			
AT#M2MCHDIR	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MMKDIR	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MRMDIR	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MRUN	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT+M2M	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MWRITE	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MDEL	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MLIST	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MREAD	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#M2MREADEXT	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
GNSS - Configuration																			
AT$LCSSLP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LCSTER	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LICLS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LTC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LCSLK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSQOS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GNSSCONST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSSTOP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSSLSR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$SUPLV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$SLP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT$SLPTYPE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$SUPLCFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LCSLUI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$SUPLSEC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$AGPSEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LCSLPP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LCSAGLO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSNHZ	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSELV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSDTM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$XTRAEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GNSS - GNSS Receiver																			
AT$GPSAT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSELNA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSRST	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSSAV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LOCMODE		•																	
GNSS - GNSS General Management																			
AT$GNSSSLCT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSDPO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$LOCATION		•																	
AT#GTPEN	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSCLRX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSAV	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSLOCK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSGLO	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GNSS - GNSS Positioning Information																			
AT$GPSNMUN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GPSNMUNEX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$NMEA		•																	
AT$GPSACP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT$GETLOCATION		•																	
AT#GTP	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•
PSM (Power Saving Mode)																			
AT+CPSMS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PSMWDISACFG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#PSMCTS														•	•	•	•	•	•
AT#PSMURC														•	•	•	•	•	•
IMS																			
AT+CIREG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#PDPIMSCFGE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
File System																			
AT#WSCRIPT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#RSCRIPT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#LSCRIPT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AT#DSCRIPT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
MQTT																			
AT#MQEN	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQSUB	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQUNS	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQPUBS	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQCFG	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQCFG2	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQWCFG	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQTCFG	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQSCFG	•	•	•	•	•	•	•				•	•							
AT#MQCONN	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQDISC	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQREAD	•	•	•	•	•	•	•				•	•		•	•	•	•	•	•
AT#MQVCFG	•	•	•	•	•	•	•				•	•							
AT#MQCOPP	•	•	•	•	•	•	•				•	•							
AT#MQSUPP	•	•	•	•	•	•	•				•	•							
AT#MQPUPP	•	•	•	•	•	•	•				•	•							
AT#MQWIPP	•	•	•	•	•	•	•				•	•							
AT#MQDIPP	•	•	•	•	•	•	•				•	•							
Customization Feature AT commands																			
AT#APPRUN	•	•	•	•	•	•	•	•	•	•	•	•	•						
AT#AVAHIEN	•	•	•	•	•	•	•				•	•							
Dying GASP AT Commands																			
AT#DGEN	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bluetooth Low Energy																			
AT#BI	•	•	•	•	•						•	•							
AT#BCONNECT	•	•	•	•	•						•	•							
AT#BDISCONNECT	•	•	•	•	•						•	•							

Not Subject to NDA

AT Commands	LE910C1-NA	LE910C1-NS	LE910C1-AP	LE910Cx-NF	LE910Cx-EU	LE910Cx-LA	LE910C4-CN	LE910C1-SV	LE910C1-ST	LE910C1-SA	LE910C1-NAD	LE910Cx-NFD	LE910Cx-SAD	LE910C1-EUX	LE910C1-SVX	LE910C1-SAX	LE910Cx-WWX	LE910Cx-WWXD	LE910Cx-SAXD
AT#BSCAN	•	•	•	•	•						•	•							
AT#BSRVD	•	•	•	•	•						•	•							
AT#BREAD	•	•	•	•	•						•	•							
AT#BWRITE	•	•	•	•	•						•	•							
AT#BADVE	•	•	•	•	•						•	•							
AT#BATTRIB	•	•	•	•	•						•	•							
AT#BSRVDATAEX	•	•	•	•	•						•	•							
AT#BADVDATA	•	•	•	•	•						•	•							
AT#BSCANRSPDATA	•	•	•	•	•						•	•							
AT#BNAME	•	•	•	•	•						•	•							
AT#BPNPPID	•	•	•	•	•						•	•							
AT#BPNPPVER	•	•	•	•	•						•	•							
AT#BPNPVID	•	•	•	•	•						•	•							
AT#BPNPVSRC	•	•	•	•	•						•	•							
AT#BCONINTMAX	•	•	•	•	•						•	•							
AT#BCONINTMIN	•	•	•	•	•						•	•							
AT#BADVINTMAX	•	•	•	•	•						•	•							
AT#BADVINTMIN	•	•	•	•	•						•	•							
AT#BSLAVELAT	•	•	•	•	•						•	•							
AT#W	•	•	•	•	•						•	•							
AT#BSSPPIN	•	•	•	•	•						•	•							
AT#BSSPCONF	•	•	•	•	•						•	•							
AT#BBNDLIST	•	•	•	•	•						•	•							
AT#BBNDDEL	•	•	•	•	•						•	•							
AT#BCCCD	•	•	•	•	•						•	•							
Bluetooth Low Energy ASYNC AT Response																			
AT#BNOTIFY	•	•	•	•	•						•	•							
AT#BINDICATE	•	•	•	•	•						•	•							

Table 7: AT Commands Availability Table

Not Subject to NDA

Note: LE910Cx-NF variant supports 3 mobile network operators such as AT&T, VZW and T-Mobile and there are some AT commands dedicated and unique to only one specific operator.

Notation for LE910Cx-NF variant is marked as below.

"●": Common. "A": AT&T Only. "V": VZW Only.

Not Subject to NDA

3. AT COMMANDS REFERENCES

3.1. Call & DTMF

3.1.1. AT+CHUP - Hang Up Call

This command cancels all active and held calls

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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

Not Subject to NDA

3.1.2. AT+CSTA - Select Type of Address

Select type of address.

3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CSTA=[<type>]

Set command selects the type of number for further dialing commands (D) according to 3GPP specifications.

Parameter:

Name	Type	Default	Description
<type>	integer	129	type of address octet in integer format (refer to 3GPP TS 24.008, sub clause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129

Values:

129 : National address type.

145 : International number. Dialing string includes international access code character "+".

AT+CSTA?

Read command returns the current value of <**type**> parameter in the format:

+CSTA: <type>

Not Subject to NDA

AT+CSTA=?

Test command reports the range of the <type> parameter values.

Not Subject to NDA

3.1.3. AT+FCLASS - Select Active Service Class

This command sets the wireless module in specified connection mode (data, voice), hence all the calls done afterwards will be data or voice.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+FCLASS=<n>

Parameter:

Name	Type	Default	Description
<n>	integer	0	type of call Values: 0 : data type 8 : voice type

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>.

Not Subject to NDA

3.1.4. AT#ACAL - Automatic Call

Automatic Call.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#ACAL=[<mode>]

Set command enables/disables the automatic call function.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	disables or enables the automatic call function Values: 0 : disable the automatic call function 1 : enable the automatic call function

Additional info:

<mode>=1

If the automatic call function is enabled, and &D2 command has been issued, the transition OFF/ON of DTR causes an automatic call to the first number (position 0) stored in the internal phonebook.

Type of call depends on the last issue of command +FCLASS.

See &Z and &N commands respectively to write or read the phone number on/from the internal phonebook of the module.

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AT#ACAL?

Read command reports the current automatic call function mode in the format:

#ACAL: <mode>

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**. Due to this possible situation it is strongly recommended not to use contemporaneously both commands.

Because of the typing in of the **#ACALEXT** (Extended Automatic Call) command, the **#ACAL?** read command could return a value supported by **#ACALEXT** and not by **#ACAL** set command. Therefore, it is strongly recommended to avoid the use of these two commands at the same time.

AT#ACAL=?

Test command returns the supported range of **<mode>** parameter values.

- Assume that **#ACALEXT** command has been entered. The **#ACAL?** read command could return the following parameter value.

  AT#ACAL?
  #ACAL: 2
  OK

Not Subject to NDA

3.1.5. AT#ACALEXT - Extended Automatic Call

This command enables the extended automatic call function.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#ACALEXT=<mode>,<index>

Set command enables/disables the extended automatic call function.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the automatic call function to a contact in the selected phonebook Values: 0 : disable 1 : enable, internal phonebook 2 : enable, "SM" phonebook 3 : enable, "ME" phonebook
<index>	integer	0	position in the currently selected phonebook Value: 0÷max : index

The max value of <**index**> is given by the test command.

If the extended automatic call function is enabled and **&D2** has been issued, the transition OFF/ON of DTR causes an automatic

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call to the number stored in position <**index**> in the selected phonebook.

The type of call depends on the last setting of the command **+FCLASS**.

See **&Z** and **&N** commands respectively to write or read the phone number on/from the internal phonebook of the module.

AT#ACALEXT?

Read command returns the current value of <**mode**> and <**index**> in the format:

#ACALEXT: <mode>,<index>

AT#ACALEXT=?

Test command returns three ranges of values: the first for parameter <**mode**>, the second for parameter <**index**>, when the internal phonebook is chosen, and the third for parameter <**index**>, when the "SM" phonebook is chosen, the fourth for parameter <**index**> when "ME" phonebook is chosen.

The range of available positions in a phonebook depends on the selected phonebook.

Not Subject to NDA

3.1.6. AT#ECAM - Extended Call Monitoring

This command enables/disables the call monitoring function in the ME.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT#ECAM=[<onoff>]

Set command enables/disables the call monitoring function in the ME.

Parameter:

Name	Type	Default	Description
<onoff>	integer	0	Enables/disables the call monitoring function in the ME, that informs the user about call events such as incoming call, connected, hang up etc. using the following unsolicited indication: **#ECAM: <ccid>,<ccstatus>,<calltype>,,,[<number>,<type>]** Values: 0 : disables call monitoring function 1 : enables call monitoring function

Unsolicited fields:

Name	Type	Description
<ccid>	integer	call ID number
<ccstatus>	integer	call status Values: 0 : idle 1 : calling (MO)

Not Subject to NDA

		2 : connecting (MO) 3 : active 4 : hold 5 : waiting (MT) 6 : alerting (MT) 7 : busy 8 : retrieved 9 : CNAP (Calling Name Presentation) information (MT)
<calltype>	integer	call type indicator Values: 1 : voice 2 : data
<number>	string	called number (valid only if <**ccstatus**> is 1)
<type>	string	type of <**number**> Values: 129 : national number 145 : international number

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:

Not Subject to NDA

#ECAM: <onoff>

AT#ECAM=?

Test command returns the list of supported values for <**onoff**>

Not Subject to NDA

3.1.7. AT#ECAMURC - Extended Call Monitoring Unsolicited Response mode

This command Change the mode of #ECAM URC presentation.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#ECAMURC=<mode>

Set command Change the mode of #ECAM URC presentation.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	

Values:

0 : The presentation of the #ECAM URC between at command and response (default value).

1 : The presentation of the #ECAM URC information after at command response.

The setting is saved in NVM and available on following reboot.

AT#ECAMURC?

Read command reports last <mode>, in the format:

#ECAMURC:<mode>

AT#ECAMURC=?

Test command reports the supported range of values for parameter <mode>

Not Subject to NDA

Mode = 0

atd0YYYYYYYYY;
#ECAM: 0,1,1,,,"0YYYYYYYYY",129

#ECAM: 0,3,1,,,

OK
at+chup
#ECAM: 0,0,1,,,

OK

Mode = 1

atd0YYYYYYYYY;
OK

#ECAM: 0,1,1,,,"0YYYYYYYYY",129

#ECAM: 0,3,1,,,

at+chup
OK

#ECAM: 0,0,1,,,

Not Subject to NDA

3.1.8. AT#CFF - Call Forwarding Flags

The command configures the format of call forwarding URC

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#CFF=<enable>

Set command enables/disables the presentation of the call forwarding flags URC

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enable/disable the presentation of the **#CFF** URC The URC format is: **#CFF: <enable>,<status>,<fwdtonum>**

Values:

0 : disable the presentation of the #CFF URC

1 : enable the presentation of the #CFF URC. The #CFF URC is shown each time the Call Forwarding Unconditional (CFU) SS setting is changed or checked. It is also shown on each startup, and it reports the status of the call forwarding flags, as they are currently stored on SIM

Unsolicited fields:

Name	Type	Description
<staus>	integer	Reports if CFU is enabled or disabled Values:

Not Subject to NDA

		0 :	CFU disabled
		1 :	CFU enabled
<fwdtonum>	string	Reports phone number used to forward the incoming calls	

AT#CFF?

Read command reports whether the presentation of the call forwarding flags URC is currently enabled or not.

Moreover, if the flags field is present in the SIM, it reports 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**>

Not Subject to NDA

3.1.9. AT#CESTHLCK - Call Establishment Lock

This command can be used to disable call abort before the DCE enters connected state.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#CESTHLCK=[<closure_type>]

Parameter:

Name	Type	Default	Description
<closure_type>	integer	0	dummy parameter

Values:

0 : Aborting the call setup by reception of a character is generally possible at any time before the DCE enters connected state

1 : Aborting the call setup is disabled until the DCE enters connected state

AT#CESTHLCK?

Read command returns the current value of the parameter **<closure_type>** in the format:

#CESTHLCK: <closure_type>

AT#CESTHLCK=?

Test command returns the supported values of the parameter **<closure_type>**.

Not Subject to NDA

3.1.10. AT+VTS - DTMF Tones Transmission

The command handles the transmission of DTMF tones.

3GPP TS 27.007
TIA IS-101

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+VTS=<dtmfString>[,<duration>]

Execution command allows the transmission of DTMF tones.

Parameters:

Name	Type	Default	Description
<dtmfString>	string	-	string of <**dtmf**>s, i.e. ASCII characters in the set (0 9), #,*,(A-D),P; the string can be at most 255 <dtmf>s long; it allows the user to send a sequence of DTMF tones, each of them with a duration that was defined through **+VTD** command
<duration>	integer	0	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 Values: 0 : a single DTMF tone will be transmitted for a duration depending on the network, no matter what the current AT+VTD setting is

Not Subject to NDA

10÷255	:	a single DTMF tone will be transmitted for a time <duration> (in 10 ms multiples), no matter what the current AT+VTD setting is

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.

This command operates in voice mode only (see **+FCLASS**).

AT+VTS=?

Test command provides the list of supported <**dtmf**>s and the list of supported <**duration**>s in the format:

(list of supported <**dtmf**>s)**[**,(list of supported <**duration**>s)**]**

Not Subject to NDA

3.1.11. AT+VTD - Tone Duration

This command sets the length of tones transmitted with **+VTS** command.

3GPP TS 27.007
TIA IS-101

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Common profile	No	-	2

AT+VTD=<duration>

Set command refers to an integer <**duration**> that defines the length of tones emitted with **+VTS** command.

Parameter:

Name	Type	Default	Description
<duration>	integer	2	duration of a tone

Values:

0 : the duration of every single tone is dependent on the network

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=?

Not Subject to NDA

Test command provides the list of supported <**duration**>

Not Subject to NDA

3.1.12. AT+CMOD - Call mode

This command set selects the call mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CMOD=[<mode>]

Set command selects the call mode of further dialing commands (D) or for next answering command (A). Mode can be either single or alternating (in the present document, terms "alternating mode" and "alternating call" refer to all GSM/UMTS bearer and teleservices that incorporate more than one basic service (voice, data, fax) within one call).

When single mode is selected the call originating and hangup procedures are similar to procedures specified in ITU-T Recommendations V.250, T.31 and T.32.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	
	Value:		
	0 : single mode (default mode)		

+CMOD shall be set to zero after a successfully completed alternating mode call. It shall be set to zero also after a failed answering. The power-up, factory (**&F**)

and user resets (**Z**) shall also set the value to zero.

This reduces the possibility that alternating mode calls are originated or answered accidentally.

AT+CMOD?

Not Subject to NDA

Read command returns values supported as a compound value.

+CMOD: <mode>

AT+CMOD=?

+CMOD: (list of supported **<mode>**)

Not Subject to NDA

3.1.13. AT#CODECIMS - Codec for IMS

This command sets the IMS codec mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CODECIMS=[<amr_wb>],[<amr_nb>],[<amr_wb_en>]

Set command sets the IMS codec mode.

Parameters:

Name	Type	Default	Description
<amr_wb>	hex	N/A	AMR Wideband mode; configurable as a bitmask
	Values:		
	0x1 : Mode 0 (6.60kbps)		
	0x2 : Mode 1 (8.85kbps)		
	0x4 : Mode 2 (12.65kbps)		
	0x8 : Mode 3 (14.25kbps)		
	0x10 : Mode 4 (15.85kbps)		
	0x20 : Mode 5 (18.25kbps)		
	0x40 : Mode 6 (19.85kbps)		
	0x80 : Mode 7 (23.05kbps)		
	0x100 : Mode 8 (23.85kbps)		
<amr_nb>	hex	N/A	AMR Narrowband mode; configurable as a bitmask
	Values:		

Not Subject to NDA

			0x1 : Mode 0 (4.75kbps) 0x2 : Mode 1 (5.15kbps) 0x4 : Mode 2 (5.9kbps) 0x8 : Mode 3 (6.17kbps) 0x10 : Mode 4 (7.4kbps) 0x20 : Mode 5 (7.95kbps) 0x40 : Mode 6 (10.2kbps) 0x80 : Mode 7 (12.2kbps) 0x100 : Mode 8 (12.2kbps)
<amr_wb_en>	integer	1	High definition voice; it enables AMR-Wideband Values: 0 : Disable 1 : Enable (Default)

The values are stored in the NV's file system.

<amr_wb> - NV 67239

<amr_nb> - NV 66031

<amr_wb_en> - NV 65964

The related NV items are for legacy model or old version only. So the default value is set by "0,0,1" when NVs are not configured or when there is no meaning.

AT#CODECIMS?

Read command returns the current IMS CODEC configuration mode in the format:

Not Subject to NDA

#CODECIMS: <amr_wb>,<amr_nb>,<amr_wb_en>

AT#CODECIMS=?

Test command returns the available range values of parameters:

<amr_wb>,<amr_nb>,<amr_wb_en>

at#codecims=149,5,1

Means :

<amr_wb> = 149 ; mode 0, 2, 4, 7

<amr_nb> = 5 ; mode 0, 2

<amr_wb_en> = 1 ; AMR-Wideband is enabled

Not Subject to NDA

3.1.14. AT#ECTD - Enhanced call tone disable

This command sets to disable related with call tone according to **<type>** parameter.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ECTD=[<type>]

Set command sets to disable related with call tone according to **<type>** parameter.

Parameter:

Name	Type	Default	Description
<type>	integer	0	representing a type of call tones which the command refers to Values: 0 : Not disable call tones (default) 1 : Call end tone

AT#ECTD?

Read command returns the current type of disabled call tone:

#ECTD: <type>

AT#ECTD=?

Test command reports the range for the parameter **<type>**

Not Subject to NDA

3.1.15. AT+CSNS - Single Numbering Scheme

This command selects the bearer used when the mobile terminated single numbering scheme call is established.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CSNS=[<mode>]

Set command selects the bearer used when the mobile terminated single numbering scheme call is established. Parameter values set with **+CBST** command used when **<mode>** equals to a data service.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Values: 0 : voice (factory default) 2 : fax (TS 62)/9 (not supported by LTE) 4 : data

if **+CBST** parameter is set to a value that is not applicable to single numbering calls, ME/TA shall map the value to the closest valid one. E.g. if user has set **<speed>=71**, **<name>=0** and **<ce>=1** (non-trasparent asynchronous 9600 bps V.110 ISDN connection) for mobile originated calls, ME/TA shall map the values into non-transparent asynchronous 9600 bps V.32 modem connection when single numbering scheme call is answered.

Not Subject to NDA

AT+CSNS?

Read command returns current value of the parameter **<mode>**.

AT+CSNS=?

Test command returns supported values of parameter **<mode>**.

In LE910C1-SV/ST/SA, set command has no effect is included only for backward compatibility.

Not Subject to NDA

3.1.16. AT+CR - Service Reporting Control

This command enables the **+CR** reporting.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CR=[<mode>]

Set command controls whether or not intermediate result code **+CR** is returned from **TA** to **TE**.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable **+CR** reporting Values: 0 : disables +CR reporting 1 : enables +CR reporting

Unsolicited field:

Name	Type	Description
<serv>	string	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:

Not Subject to NDA

After power off/on in LE910Cx the value returen to "0".

+CR: <serv>

Values:

ASYNC	:	asynchronous transparent
SYNC	:	synchronous transparent
REL ASYNC	:	asynchronous non-transparent
REL SYNC	:	synchronous non-transparent

This command replaces V.25ter [14] command Modulation Reporting Control (**+MR**), which is not appropriate for use with a UMTS terminal.

AT+CR?

Read command returns whether or not intermediate result code **+CR** is enabled, in the format:

+CR: <mode>

AT+CR=?

Test command returns the supported range of values of parameter **<mode>**.

Not Subject to NDA

3.1.17. AT+CRC - Cellular Result Codes

Set command controls whether the extended format of incoming call indication is used.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CRC=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	disables/enables extended format reporting. When enabled, an incoming call is indicated to the TE with unsolicited result code **+CRING: <type>** instead of the normal **RING**

Values:

0 : disables extended format reporting (factory default)

1 : enables extended format reporting

Unsolicited field:

Name	Type	Description
<type>	string	call type Values:

Not Subject to NDA

ASYNC	:	asynchronous transparent data
SYNC	:	synchronous transparent data
REL ASYNC	:	asynchronous non-transparent data
REL SYNC	:	synchronous non-transparent data
FAX	:	facsimile (TS 62)
VOICE	:	normal voice (TS 11)

Entering **AT+CRC=** returns **OK** but has no effect.

AT+CRC?

Read command returns current value of the parameter <**mode**>

AT+CRC=?

Test command returns supported values of the parameter <**mode**>

Not Subject to NDA

3.1.18. AT+CVHU - Voice Hung Up Control

This command is used in order to set how to disconnect a voice connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CVHU=[<mode>]

Set command selects whether **ATH** or "drop DTR" shall cause a voice connection to be disconnected or not.

Parameter:

Name	Type	Default	Description
<mode>	integer	2	Selects how to disconnect a voice connection.

Values:

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.

OK result code is displayed only when using UART depending on the model.

AT+CVHU?

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

+CVHU: <mode>

Not Subject to NDA

AT+CVHU=?

Test command reports the range of supported values for parameter <mode>.

Not Subject to NDA

3.1.19. AT+CBST - Select Bearer Service Type

Select bearer service type and connection element for data calls

3GPP TS 27.007

- 3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CBST=[<speed>[,<name>[,<ce>]]]

Set command selects 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:

Name	Type	Default	Description
<speed>	integer	0	data rate

Values:

0 : autobauding (automatic selection of the speed)

14 : 14400 bps (V.34)

16 : 28800 bps (V.26ter)

17 : 33600 bps (V.32)

43 : 14400 bps (V.32)

48 : 28800 bps (V.34)

Not Subject to NDA

51 : 56000 bps (V.34)

75 : 14400 bps (V110 or X.31 flag stuffing)

80 : 14400 bps (V110 or X.31 flag stuffing)

81 : 38400 bps (V110 or X.31 flag stuffing)

83 : 56000 bps (V110 or X.31 flag stuffing

84 : 64000 bps (X.31 flag stuffing)

116 : 64000 bps (bit transparent)

134 : 64000 bps (multimedia)

<name>	integer	N/A	bearer service name

Values:

0 : data circuit asynchronous (UDI or 3.1 kHz modem)

1 : data circuit synchronous (UDI or 3.1 kHz modem)

4 : data circuit asynchronous (RDI)

<ce>	integer	1	connection element

Values:

0 : transparent

1 : non transparent

Additional info:

▶▶ **The bearer service on LE910Cx family only has support for the following combinations:**

<GSM network>

AT+CBST= 0,0,1 (Autobaud 9.6k, non transparent)

AT+CBST=14,0,1 (V.34 14.4k, non transparent)

AT+CBST=43,0,1 (V.120 14.4k, non transparent)

Not Subject to NDA

AT+CBST=75,0,1 (V.110 14.4k, non transparent)

<WCDMA network>

AT+CBST= 0,0,1 (Autobaud 57.6k, non transparent)

AT+CBST=14,0,1 (V.34 14.4k, non transparent)

AT+CBST=16,0,1 (V.34 28.8k, non transparent)

AT+CBST=17,0,1 (V.34 33.6k, non transparent)

AT+CBST=43,0,1 (V.120 14.4k, non transparent)

AT+CBST=48,0,1 (V.120 28.8k, non transparent)

AT+CBST=51,0,1 (V.120 56k, non transparent)

AT+CBST=75,0,1 (V.110 14.4k, non transparent)

AT+CBST=80,0,1 (V.110 28.8k, non transparent)

AT+CBST=81,0,1 (V.110 38.4k, non transparent)

AT+CBST=83,0,1 (X.31FS 56k, non transparent)

AT+CBST=83,4,1 (X.31FS 56k RDI, non transparent)

AT+CBST=84,0,1 (X.31FS 64k, non transparent)

AT+CBST=116,1,0 (Bit transparent 64 kbps, transparent)

AT+CBST?

Read command returns current value of the parameters **<speed>**, **<name>** and **<ce>**.

AT+CBST=?

Test command returns the supported range of values for the parameters.

Not Subject to NDA

AT+CBST= 7,0,1 (V.32 9.6k, non transparent) - Not supported

AT+CBST=12,0,1 (V.34 9.6k, non transparent)) - Not supported

AT+CBST=39,0,1 (V.120 9.6k, non transparent) - Not supported

AT+CBST=71,0,1 (V.110 9.6k, non transparent) - Not supported

AT+CBST= 7,0,0 (V32 9.6k, transparent) - Not supported

AT+CBST=12,0,0 (V34 9.6k, transparent) - Not supported

AT+CBST=14,0,0 (V34 14.4k, transparent) - Not supported

Not Subject to NDA

3.1.20. AT+CRLP - Radio Link Protocol

Set Radio Link Protocol (RLP) parameters.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>]]]]]

Set command sets parameters used when non-transparent data calls are originated.

Parameters:

Name	Type	Default	Description
<iws>	integer	N/A	IWF window dimension
	Values:		
	1÷61 : factory default value is 61 (ver 0/1)		
	1÷488 : factory default value is 240 (ver 2)		
<mws>	integer	N/A	MS window dimension
	Values:		
	1÷61 : default value is 61 (ver 0/1)		
	1÷488 : factory default value is 240 (ver 2)		
<T1>	integer	N/A	acknowledge timer (10 ms units)
	Values:		
	39÷255 : default value is 48 (ver 0 or 1)		

Not Subject to NDA

	42÷255 : default value is 52 (ver 2)		
<N2>	integer	N/A	retransmission attempts Value: 1÷255 : default value is 6 (ver 0/1/2)
<ver>	integer	N/A	protocol version Value: 0÷2 : supported value

AT+CRLP?

Read command returns current settings for each supported RLP version **<ver>**.

+CRLP: <iws>,<mws>,<T1>,<N2>

+CRLP: <iws>,<mws>,<T1>,<N2>,<ver>

OK

AT+CRLP=?

Test command returns the range of setting value for each supported RLP version **<ver>**.

Versions 0 and 1 share the same parameter set. Read and Test commands shall return only one line for this set (where **<ver>** is not present)

Not Subject to NDA

3.1.21. AT#NCIH - NO CARRIER Indication Handling

This command purpose is to Enable\Disable the **NO CARRIER** indication message when an incoming call is dropped.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#NCIH=<enable>

Set command enables/disables the sending of a **NO CARRIER** indication due to incoming ringing call dropped by the caller before the answer takes place.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	Enable/Disable value for **NO CARRIER** indication sending. Values: 0 : disabled 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>**.

Not Subject to NDA

Not Subject to NDA

3.2. General Control and Config

3.2.1. Command Line Prefixes

3.2.1.1. AT - Starting a Command Line

AT is the prefix used to start a command line.

ITU-T Recommendation V.25 ter

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT

The prefix **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. As a command, it can be issued just to test if the device is responding to AT commands.

Not Subject to NDA

3.2.1.2. A/ - Last Command Automatic Repetition

The command immediately executes the previously issued command or commands.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

A/

If the prefix **A/** is issued, the device immediately executes once again the body of the preceding command line. No editing is possible, and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired.

If **A/** is issued before any command line has been executed, the preceding command line is assumed to have been empty (that results in an **OK** result code).

This command works only at fixed IPR.

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**.

Not Subject to NDA

3.2.1.3. AT#/ - Repeat Last Command

The command immediately executes the previously issued command or commands.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#/

If **AT#/** is issued, the device immediately executes once again the body of the preceding command line. No editing is possible, and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired.

If **AT#/** 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).

This command is the same as **A/** but does not need a fixed **+IPR**.

Not Subject to NDA

3.2.2. Generic Modem Control

3.2.2.1. AT#SELINT - Select Interface Style

This command sets the AT command interface style.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SELINT=[<v>]

Set command sets the AT command interface style depending on parameter.

Parameter:

Name	Type	Default	Description
<v>	integer	2	AT command interface style Value: 2 : standard AT parser

AT#SELINT?

Read command reports the current interface style in the format:

#SELINT: <v>

AT#SELINT=?

Test command reports the available range of values for parameter **<v>**.

Not Subject to NDA

3.2.2.2. AT&F - Set to Factory-Defined Configuration

Set configuration parameters to default values.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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:

Name	Type	Default	Description
<value>	integer	0	parameters to reset

Values:

0 : only the factory profile base section parameters are considered

1 : either the factory profile base section and the extended section are considered (full factory profile)

If parameter <**value**> is omitted, the command has the same behavior as **AT&F0**.

Not Subject to NDA

3.2.2.3. ATZ - Soft Reset

Soft Reset

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

ATZ[<n>]

Execution command loads the base section of the specified user profile and the extended section of the default factory profile

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	user profile number Value: 0,1 : user profile number

If parameter **<n>** is omitted, the command has the same behavior as **ATZ0**

Any active call is terminated.

Not Subject to NDA

3.2.2.4. AT&Y - Default Reset Basic Profile Designation

Define the basic profile is loaded on startup.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT&Y[<n>]

Execution command defines the basic profile that will be loaded on startup.

Parameter:

Name	Type	Default	Description
<n>	integer	0	basic profile that will be loaded on startup.

Value:

0,1 : profile number: the wireless module can store 2 complete configurations (see command &W).

Differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&Y** will be loaded on every startup.

If parameter is omitted the command has the same behavior as **AT&Y0**.

In LE910Cx, **AT&Y** is not supported.

Not Subject to NDA

3.2.2.5. AT&P - Default Reset Full Profile Designation

Define which full profile is loaded at startup.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT&P[<n>]

Execution command defines which full profile will be loaded at startup.

Parameter:

Name	Type	Default	Description
<n>	integer	0	full profile will be loaded on startup.

Value:

0,1 : profile number: the wireless module can store 2 full configurations (see command &W).

Differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&P** will be loaded at every startup.

If parameter is omitted, the command has the same behavior as **AT&P0**

Not Subject to NDA

3.2.2.6. AT&W - Store Current Configuration

Stores the complete configuration of the device.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&W[<n>]

Execution command stores on profile <n> the complete configuration of the device.

Parameter:

Name	Type	Default	Description
<n>	integer	0	profile identifier
	Value:		
	0,1 :	profile identifiers	

If parameter is omitted, the command has the same behavior of **AT&W0**.

Not Subject to NDA

3.2.2.7. AT&V - Display some Configuration and Profile

The command displays some of the basic modem configuration settings and parameters

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&V

Execution command returns some of the basic modem configuration settings and parameters, one for each row, in the format:

setting/parameter : value

The row of information about **CTS (C106) OPTIONS** is in the output of **&V** for compatibility reasons and represents only a dummy value.

Not Subject to NDA

Example of returned values.

- AT&V

```
COMMAND ECHO                  :  E1=YES
RESULT MESSAGES               :  Q0=YES
VERBOSE MESSAGES              :  V1=YES
EXTENDED MESSAGES             :  X1=YES
LINE SPEED                    :  F0=autodetect
CONSTANT DTE SPEED            :  YES
FLOW CONTROL OPTIONS          :  &K3=HW bidirect.
ERROR CORRECTION MODE         :  RLP
CTS (C106) OPTIONS            :  &B2=OFF while disc.
DSR (C107) OPTIONS            :  &S3=PHONE ready->ON
DTR (C108) OPTIONS            :  &D0=ignored
DCD (C109) OPTIONS            :  &C1=follows carrier
RI (C125) OPTIONS             :  \R1=OFF dur. off-hk
C108/1 OPERATION              :  &D0=NO
POWER SAVING ON DTR           :  +CFUN:1=NO
DEFAULT PROFILE               :  &Y0=user profile 1

OK
```


Not Subject to NDA

3.2.2.8. AT\V - Single Line Connect Message

This command sets single line connect message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT\V[<n>]

Execution command sets single line connect message.

Parameter:

Name	Type	Default	Description
<n>	integer	0	set single line connect message Values: 0 : set OFF 1 : set ON

if parameter is omitted, the command has the same behaviour of **AT\V0**.

Not Subject to NDA

3.2.2.9. AT+GCI - Country of Installation

Set command allows to select the installation country code according to ITU-T35 Annex A.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+GCI=<code>

Parameter:

Name	Type	Default	Description
<code>	integer	59	installation country code
	Value:		
	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 values of parameter **<code>**.

Not Subject to NDA

3.2.2.10. AT%L - Line Signal Level

It has no effect and is included only for backward compatibility with landline modems.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

Not Subject to NDA

3.2.2.11. AT%Q - Line Quality

It has no effect and is included only for backward compatibility with landline modems

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

Not Subject to NDA

3.2.2.12. ATL - Speaker Loudness

It has no effect and is included only for backward compatibility with landline modems.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

ATL<n>

Set command has no effect and is included only for backward compatibility with landline modems.

Parameter:

Name	Type	Default	Description
<n>	integer	-	This parameter has no effect

Not Subject to NDA

3.2.2.13. ATM - Speaker Mode

It has no effect and is included only for backward compatibility with landline modems.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

ATM=<n>

Set command has no effect and is included only for backward compatibility with landline modems.

Parameter:

Name	Type	Default	Description
<n>	integer	-	No effect.

Not Subject to NDA

3.2.2.14. AT+GCAP - Capabilities List

This command returns the equipment supported command set list.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+GCAP

Execution command returns the equipment supported command set list.

Additional info:

- Supported Command Set:

  +CGSM: 3GPP TS command set
  +DS: Data Service common modem command set
  +ES: WCDMA data Service common modem command set
  +MS: Mobile Specific command set

Not Subject to NDA

3.2.2.15. AT+GMI - Manufacturer Identification

This command returns the manufacturer identification.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+GMI

Execution command returns the manufacturer identification followed by an <OK> at newline.

AT+GMI=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.16. AT+GMM - Model Identification

The command returns the model identification.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+GMM

The execution command returns the model identification followed by an <OK> at newline.

AT+GMM=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.17. AT+GMR - Revision Identification

The command returns the software revision identification.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+GMR

Execution command returns the software revision identification followed by an <OK> at newline.

AT+GMR=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.18. AT+CEER - Extended Error Report

Reports extended error related to the last unsuccessful call.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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>

+CEER: <report>

This report regards some error condition that may occur:

1. the failure in the last unsuccessful call setup (originating or answering)
2. the last call release
3. the last unsuccessful LTE attach or unsuccessful PDP context activation,
4. the last LTE detach or PDP context deactivation.

the first line for the voice and the second line for data.

If no error condition has occurred since power up, then **"Normal, unspecified"** condition is reported

AT+CEER=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.19. AT+GSN - Serial Number

This command reports the device board serial number.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+GSN[=<snt>]

Execution command returns the device board serial number. The number returned is not the IMSI, but it is the board number.

Parameter:

Name	Type	Default	Description
<snt>	string	0	the serial number type Values: 0 : returns <sn> 1 : returns <imei> 2 : returns <imeisv> 3 : returns <svn>

Additional info:

- **<sn>** - Indicate the product "serial number", identified as the IMEI of the mobile, without command echo.

  <imei> - International Mobile station Equipment Identity; IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit).

Not Subject to NDA

<imeisv> - International Mobile station Equipment Identity and Software Version number; The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits).

<svn> - Software Version Number

AT+GSN=?

Test command returns the supported **<snt>** values.

Not Subject to NDA

3.2.2.20. AT+CGMI - Request Manufacturer Identification

The command returns device manufacturer identification code.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CGMI

Execution command returns the device manufacturer identification code followed by an **OK** at newline.

AT+CGMI=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.21. AT+CGMM - Request Model Identification

This command returns the device model identification.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+CGMM

Execution command returns the device model identification code followed by an **OK** at newline.

AT+CGMM=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.22. AT+CGMR - Request Revision Identification

The command returns device software revision number.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CGMR

Execution command returns device software revision number followed by an **OK** at newline.

AT+CGMR=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.23. AT+CGSN - Request Product Serial Number Identification

This command allows to retrieve the product serial number in form of IMEI of the mobile.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CGSN[=<snt>]

Execution command returns the product serial number, identified as the IMEI of the mobile.

Parameter:

Name	Type	Default	Description
<snt>	string	N/A	the serial number type Values: 0 : returns <sn> 1 : returns <imei> 2 : returns <imeisv> 3 : returns <svn>

Additional info:

- **<sn>** - serial number, identified as the IMEI of the mobile, without command echo.

  <imei> - International Mobile station Equipment Identity; IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit).

Not Subject to NDA

<imeisv> - International Mobile station Equipment Identity and Software Version number; The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits).

<svn> - Software Version Number

AT+CGSN=?

Test command returns supported **<snt>** values.

Not Subject to NDA

3.2.2.24. AT#CGMI - Request Manufacturer Identification

The command returns device manufacturer identification code.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CGMI

Execution command returns the device manufacturer identification code, with command echo.

The response is as follows

#CGMI: *<code>*

OK

AT#CGMI=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.25. AT#CGMR - Request Revision Identification

The command returns device software revision number.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CGMR

Execution command returns device software revision number, with command echo.

The response is as follows

#CGMR: <num>

OK

AT#CGMR=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.26. AT#CGSN - Product Serial Number Identification

This command returns the product serial number, identified as the IMEI of the mobile, with command echo.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CGSN[=[<snt>]]

Execution command returns the product serial number, identified as the IMEI of the mobile, with command echo.

Parameter:

Name	Type	Default	Description
<snt>	integer	0	the serial number type
	Values:		
	0 : returns <sn>		
	1 : returns <imei>		
	2 : returns <imeisv>		
	3 : returns <svn>		

Additional info:

- **<sn>** - serial number, identified as the IMEI of the mobile, without command echo.

  <imei> - International Mobile station Equipment Identity; IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit).

  <imeisv> - International Mobile station Equipment Identity and Software Version number; The 16 digits of IMEISV are composed of

Not Subject to NDA

Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits).

<**svn**> - Software Version Number

AT#CGSN=?

The test command returns supported <**snt**> values.

AT#CGSN

#CGSN: 358677008900540

OK

Not Subject to NDA

3.2.2.27. AT#SWPKGV - Request Software Package Version

This command allows to retrieve the software package version.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SWPKGV

Execution command returns the software package version without **#SWPKGV:** command echo. The response is as follows:

AT#SWPKGV
<Telit Software Package Version>-<Production Parameters Version>
<Modem FW Version>
<Production Parameters Version>
<Application FW Version>

OK

AT#SWPKGV=?

Test command returns **OK** result code.

AT#SWPKGV

38.02.000-B006-P0H.000400
M0H.020000-B014
P0H.000400
A0H.000200-B006

OK

Not Subject to NDA

3.2.2.28. AT+CPAS - Phone Activity Status

Execution command reports the device status in the form shown in Additional info section.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CPAS

Additional info:

Message format returned by the execution command:

+CPAS: <pas>

Name	Type	Default	Description
<pas>	integer	0	phone activity status.

Values:

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)

Not Subject to NDA

4 : call in progress (device is ready for commands from TA/TE, but a call is in progress)

'1' and '2' at <pas> is not supported.

In the LTE registration state, CPAS: 4 (call in progress) is displayed.

AT+CPAS=?

Test command reports the supported range of values for **<pas>**.

Although **+CPAS** is an execution command, 3GPP TS 27.007 requires the Test command to be defined.

Not Subject to NDA

3.2.2.29. AT+CFUN - Set Phone Functionality

This command selects the level of functionality in the ME.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CFUN=[<fun>[,<rst>]]

Set command selects the level of functionality in the ME.

Parameters:

Name	Type	Default	Description
<fun>	integer	1	Power saving function mode.

Values:

0 : NON-CYCLIC SLEEP mode, see Additional info section.

1 : mobile full functionality with power saving disabled.

2 : disable TX, not supported

4 : disable both TX and RX

5 : mobile full functionality with power saving enabled

6 : module reboot

7 : OFF line mode. This mode cannot be set, can only be read using the read command.

8 : FTM. This mode cannot be set, can only be read using the read command.

Not Subject to NDA

<rst>	integer	0	reset flag

Values:

0 : do not reset the ME before setting it to <fun> functionality level.

1 : reset the ME before setting it to <fun> functionality level, this option works only with <fun> =1, with other it will return an error

Additional info:

- **<fun>=0**

  minimum functionality, NON-CYCLIC SLEEP mode: the AT interface is not accessible. Consequently, once you have set <fun> level 0, do not send further characters. Otherwise these characters remain in the input buffer and may delay the output of an unsolicited result code. The first wake-up event stops power saving and takes the ME back to full functionality level <fun>=1.

- Special modes, you can only see them only through the read command and you can't set those mode:

  7 - Offline mode

  8 - FTM

AT+CFUN=2 is same with <fun> 1 but the disable TX function is not supported.

Issuing **AT+CFUN=4[,0]** causes the module to perform either a network deregistration and a SIM deactivation.

Not Subject to NDA

If power saving mechanism enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity.

To place the module in power saving mode, plug out the USB, set the DTR (RS232) line to OFF and set CFUN to 5. Once in power saving, the CTS line switch to the OFF status to signal that the module is really in power saving condition. During the power saving condition, before sending any AT command on the serial line enabled the DTR line and wait for the CTS (RS232) line to go in ON status. Until the DTR line is ON, the module will maintain the power saving mode.

The power saving function does not affect the network behavior of the module. Even during the power save condition, the module remains registered on the network and reachable for incoming calls or SMS. If a call income during the power save, then the module will wake up and proceed normally with the unsolicited incoming call code with CFUN mode 5, the unsolicited messages are stored in Tx-buffer on USB until DTR line is ON.

The wake-up events from PSM are described in section 3.2.9 of software User guide(1VV0301556).

AT+CFUN?

Read command reports the current setting of <**fun**> in the format

+CFUN: <fun>

AT+CFUN=?

Test command returns the list of supported values for <**fun**> and <**rst**>.

Not Subject to NDA

3.2.2.30. AT+CIND - Indicator Control

This command is used to control the registration state of modem indicators.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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:

Name	Type	Default	Description
<state>	integer	1	registration state

Values:

0 : the indicator is deregistered; there's no unsolicited result code (+CIEV URC) automatically sent by the modem 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 modem to the application, whenever the value of the associated indicator changes; it is still possible to query the value through AT+CIND?

Not Subject to NDA

AT+CIND?

Read command returns the current value of ME indicators, in the format:

+CIND: <**ind**>,<**ind**>,...<**ind**>

the order of the values <**ind**>s is the same as that in which the associated indicators appear from test command **AT+CIND=?.**

AT+CIND=?

Test command returns pairs, where string value <**descr**> is a description (max. 16 chars) of the indicator and compound value is the supported values for the indicator, in the format:

+CIND: (<**descr**>, (**list of supported <ind>s**)),(<**descr**>, (**list of supported <ind>s**)),... (<**descr**>, (**list of supported <ind>s**))

Additional info:

Test command response parameters

Name	Type	Default	Description
<descr>	string	N/A	indicator names as follows (along with their <**ind**> ranges).

Values:

"battchg" : battery charge level; indicator <ind> in the range 0...5(bar levels), or 99 (not measurable)

"signal" : signal quality; indicator <ind> in the range 0...7(bar levels), or 99 (not measurable); same as bit

Not Subject to NDA

		error rate (<ber>) in +CSQ command
"service"	:	service availability; indicator <ind> is 0 (not registered to any network) or 1 (registered)
"sounder"	:	sounder activity; indicator <ind> is 0 (no sound activity) or 1 (sound activity)
"message"	:	message received; indicator <ind> is 0 (no unread SMS in memory "SM") or 1 (unread SMS in memory "SM")
"call"	:	call in progress; indicator <ind> is 0 (no calls in progress) or 1 (at least a call has been established)
"roam"	:	roaming; indicator <ind> is 0 (registered to home network, or not registered) or 1 (registered to other network))
"smsfull"	:	SMS memory status; indicator <ind> is 0 (memory locations available) or 1 (an SMS storage in the modem is full)
"rssi"	:	received signal strength level; indicator <ind> values are 0 (signal strength under -112dBm), from 1 to 4 (signal strength from -97 to -66 dBm, in 15 dBm steps), 5 (signal strength greater than -51 dBm), or 99 (not measurable)
"GPRS coverage	:	there is packet service coverage; indicator <ind> is 0 (no packet

Not Subject to NDA

		service) or 1 (module attached to a packet service)
"callsetup"	:	call setup status indicator; indicator <ind> values are 0 (no active call setup), 1 (MT call is ringing), 2 (MO call was initiated), 3 (MO call ringing at called party)

Next command causes all the indicators to be registered

AT+CIND=1,1,1,1,1,1,1,1,1,1

Next command causes all the indicators to be de-registered

AT+CIND=0,0,0,0,0,0,0,0,0,0

Next command to query the current value of all indicators

AT+CIND?

CIND: 4,0,1,0,0,0,0,0,2

OK

Not Subject to NDA

3.2.2.31. AT+CMER - Mobile Equipment Event Reporting

This command configures sending of unsolicited result codes from TA to TE.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	controls the processing of unsolicited result codes

Values:

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

Not Subject to NDA

	mode (after +++ was entered), all URCs stored in the buffer will be output		
<keyp>	integer	0	keypad event reporting
	Value: 0 : No keypad event reporting		
<disp>	integer	0	display event reporting
	Value: 0 : no display event reporting		
<ind>	integer	0	indicator event reporting
	Values: 0 : no indicator event reporting 2 : indicator event reporting		
<bfr>	integer	0	TA buffer clearing
	Values: 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)		

Sending of URCs in the case of key pressings or display changes are currently not implemented.

After **+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

Not Subject to NDA

compatibility. Values shown by the indicators will be current indicators values, not buffered ones. Subsequent **+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 **+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 **+CIND** first.

LE910Cx-EUX/SAX/SVX/WWX cannot be displayed sounder URC, because it does not support audio playback

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**)

Not Subject to NDA

3.2.2.32. AT+CACM - Accumulated Call Meter

This command resets the Advice of Charge related Accumulated Call Meter (ACM) value in SIM card or in the active application in the UICC.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CACM=[<pwd>]

Set command resets the Advice of Charge related accumulated call meter (ACM) value in SIM card or in the active application in the UICC. ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is usually required to reset the value.

Parameter:

Name	Type	Default	Description
<pwd>	string	-	SIM PIN2

AT+CACM?

Read command returns the current value of ACM in the format:

+CACM: <acm>

Additional info:

- Response parameter

Not Subject to NDA

Name	Type	Default	Description
<acm>	string	-	accumulated call meter value similarly coded as <ccm> under +CAOC; three bytes of the ACM value in hexadecimal format (e.g. "00001E" indicates decimal value 30)

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.

Not Subject to NDA

3.2.2.33. AT+CAMM - Accumulated Call Meter Maximum

This command sets the Advice of Charge related to accumulated call meter maximum (ACMmax) value stored in SIM.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT+CAMM=<acmmax>[,<pwd>]

Set command sets the Advice of Charge related accumulated call meter maximum value (ACMmax) stored in SIM. ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. When ACM (refer **+CACM**) reaches ACMmax calls are prohibited. SIM PIN2 is usually required to set the value.

Parameters:

Name	Type	Default	Description
<acmmax>	string	-	accumulated call meter maximum value
<pwd>	string	-	SIM PIN2

Setting **<acmmax>** to 0 disables the feature.

AT+CAMM?

Read command returns the current value of ACMmax in the format:

+CAMM: <acmmax>

Not Subject to NDA

AT+CAMM=?

Test command returns the **OK** result code.

Not Subject to NDA

3.2.2.34. AT+CPUC - Price per Unit and Currency Table

This command sets the values of Price per Unit and Currency Table.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CPUC=<currency>,<ppu>[,<pwd>]

Set command sets the values of Advice of Charge related Price per Unit and Currency Table (PUCT) stored in SIM. The PUCT information can be used to convert the home units (as used in commands **+CAOC**, **+CACM** and **+CAMM**) into currency units. SIM PIN2 is usually required to set the parameters.

Parameters:

Name	Type	Default	Description
<currency>	string	-	three-character currency code (e.g. "GBP", "DEM", "USD"); character set as specified by command select TE character set **+CSCS**
<ppu>	string	-	price per unit; dot is used as a decimal separator (e.g. "2.66")
<pwd>	string	-	SIM PIN2

AT+CPUC?

Read command reports the current values of **<currency>** and **<ppu>** parameters in the format:

Not Subject to NDA

+CPUC: <currency>,<ppu>

AT+CPUC=?

Test command returns the **OK** result code.

Not Subject to NDA

3.2.2.35. AT+CCWE - Call Meter Maximum Event

This command is used to enable/disable sending of an unsolicited result code +CCWV.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	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.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Current enable mode of **+CCWE** URC Values: 0 : Disable the call meter warning event 1 : Enable the call meter warning event

The set command will respond with an error if the Accumulated Call Meter service is not active in SIM.

<mode> is saved in NVM.

AT+CCWE?

Not Subject to NDA

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>.

Not Subject to NDA

3.2.2.36. AT+CSVM - Set Voice Mail Number

Command to set voice mail server number.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CSVM=<mode>[,<number>[,<type>]]

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.

Parameters:

Name	Type	Default	Description
<mode>	integer	1	enable/disable voice mail number
	Values:		
	0 : disable the voice mail number		
	1 : enable the voice mail number		
<number>	string	-	phone number of format specified by **<type>**
<type>	integer	129	type of address octet in integer format
	Values:		
	129 : unknown type of number and ISDN/Telephony numbering plan		
	145 : international type of number and ISDN/Telephony numbering plan (contains the character "+")		

Not Subject to NDA

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**>.

Not Subject to NDA

3.2.2.37. AT#MBN - Mailbox Numbers

This command returns the mailbox numbers stored on SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#MBN

Execution command returns the mailbox numbers stored on SIM, if this service is provided by the SIM.
The response is in the format:

[#MBN: <index>,<number>,<type>[,<text>][,mboxtype][<CR><LF>
#MBN: <index>,<number>,<type>[,<text>][,mboxtype][...]]]

Additional info:

- The response has its fields described below.

Name	Type	Default	Description
<index>	integer	-	record number
<number>	string	-	string type mailbox number in the format <**type**>
<type>	integer	N/A	type of mailbox number octet in integer format Values: 129 : national numbering scheme 145 : international numbering scheme (contains the character "+")
<text>	string	-	the alphanumeric text associated to the number; used

Not Subject to NDA

			character set should be the one selected with command **+CSCS**
<mboxtype>	string	N/A	the message waiting group type of the mailbox, if available
	Values:		
	VOICE	:	voice
	FAX	:	fax
	EMAIL	:	electronic mail
	OTHER	:	other

If all queried locations are empty (but available), no information text lines will be returned.

AT#MBN=?

Test command returns the **OK** result code.

Not Subject to NDA

3.2.2.38. AT#MWI - Message Waiting Indication

This command enables/disables the presentation of the Message Waiting Indicator (MWI) URC.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT#MWI=[<enable>]

Set command enables/disables the presentation of the Message Waiting Indicator URC, it can have two formats, as show in Additional info.

Parameter:

Name	Type	Default	Description
<enable>	integer	1	enables/disables the presentation of the #MWI: URC

Values:

0 : disables the presentation of the #MWI: URC

1 : enables the presentation of the #MWI: URC, see Additional info.

Additional info:

If **AT#MWI=1** has been entered, the **#MWI:** URC is displayed each time.

- A new message waiting indicator is received from the network, the URC format is:

#MWI: <status>,<indicator>[,<count>]

Not Subject to NDA

- The module is powered on, the URC reports the status of the message waiting indicators, as they are currently stored on SIM, the format is:

#MWI: <status>[,<indicator>[,<count>][<CR><LF>

#MWI: <status>,<indicator>[,<count>][...]]]

The parameters are described in the unsolicited fields section for each URC format.

Unsolicited fields:

Name	Type	Description
<status>	integer	indicates clear or set action when it is received from the network. Values: 0 : clear; has been deleted one of the messages related to the indicator <indicator>. 1 : set; there is a new waiting message related to the indicator <indicator>
<status>	integer	indicates the status when it is read from SIM. Values: 0 : no waiting message indicator is currently set. In this case no other information is reported. 1 : there are waiting messages related to the message waiting indicator <indicator>
<indicator>	integer	message indicator has the same meaning regardless if it comes from network or it is read from SIM.

Not Subject to NDA

		Values: 1 : either Line 1 (CPHS context) or Voice (3GPP context) 2 : Line 2 (CPHS context only) 3 : Fax 4 : E-mail 5 : Other
<count>	integer	network information reporting the number of pending messages related to the message waiting indicator <**indicator**>.
<count>	integer	number of pending messages related to the message waiting indicator <**indicator**> as it is stored on SIM

Entering **AT#MWI=** returns **OK** but has no effect.

AT#MWI?

Read command reports whether the presentation of the message waiting indicator URC is currently enabled or not, and the status of the message waiting indicators as they are currently stored on SIM. The format is:

#MWI: <enable>,<status>[,<indicator>[,<count>][<CR><LF>
#MWI: <enable>,<status>,<indicator>[,<count>][...]]]

AT#MWI=?

Test command returns the range of available values for parameter <**enable**>.

Not Subject to NDA

3.2.2.39. AT+CLAC - Available AT Commands

This command shows the available AT commands list.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CLAC

The execution command causes the ME to return one or more lines reporting the AT commands that are available to the user. The format is:

<ATcmd1>[<CR><LF><ATcmd2>[...]]

<**ATcmdn**> is the AT command.

AT+CLAC will show for all supported AT commands regardless of carrier network configuration. Particular AT command needs to activate an appropriate carrier network configuration by using **#FWSWITCH**.

AT+CLAC=?

Test command returns the OK result code.

Not Subject to NDA

3.2.2.40. AT#LANG - Select Language

Set command selects the currently used language for displaying different messages.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#LANG=<lan>

Parameter:

Name	Type	Default	Description
<lan>	string	en	selected language
	Values:		
	en : English		
	it : Italian		
	de : German		

AT#LANG?

Read command reports the currently selected <lan> in the format:

#LANG: <lan>

AT#LANG=?

Test command reports the supported range of values for parameter <lan>.

Not Subject to NDA

3.2.2.41. AT+CMEE - Report Mobile Equipment Error

The command enables the use of result code.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CMEE=[<n>]

Set command disables/enables the use of result code:

+CME ERROR: <err>

as an indication of an error relating to the **+Cxxx** command issued.

When enabled, device related errors cause the **+CME ERROR: <err>** final result code instead of the default **ERROR** final result code. **ERROR** is returned normally when the error message is related to syntax, invalid parameters or DTE functionality.

Parameter:

Name	Type	Default	Description
<n>	integer	0	enable flag
	Values:		
	0 : disable		
	1 : enable and use numeric<err> values		
	2 : enable and use verbose <err> values		

The detailed description of <**err**> is available in section "ME Error Result Code - +CME ERROR: <err>".

Not Subject to NDA

+CMEE has no effect on the final result code +CMS.

AT+CMEE?

Read command returns the current value of parameter <n> in the format:

+CMEE: <n>

AT+CMEE=?

Test command returns the supported values of parameter <n>.

Not Subject to NDA

3.2.2.42. AT#CEERURC - Extended Error Report Unsolicited Response

This command enable/disable the **+CEER** URC

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CEERURC=<mode>

Set command enable/disable the **+CEER** URC presentation regards some error condition that may occur. (See +CEER AT command).

Parameter:

Name	Type	Default	Description
<mode>	integer	0	

Values:

0 : Disable the presentation of the +CEER URC (default value).

1 : Enable the presentation of the +CEER URC.

AT#CEERURC?

Read command returns current value of the <mode> parameter:

#CEERURC: <mode>

AT#CEERURC=?

Test command reports the supported range of values for parameter **<mode>**

Not Subject to NDA

3.2.2.43. AT#OVERRIDEPDP - Set the default PDP type for LTE in home network or roaming network

Set the default PDP type for LTE in home network or roaming network.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#OVERRIDEPDP=<cid>,<network_type>,<PDP_type>

Set command configures the default PDP type for LTE in home network or roaming network.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	(PDP Context Identifier) numeric parameter which specifies a particular PDP context definition. Value: 1÷max : where the value of max is returned by the Test command
<network_type>	integer	N/A	specifies a particular network type definition. Values: 0 : LTE Home Network 1 : LTE Roaming Network
<PDP_type>	string	N/A	specifies the type of packet data protocol. Values: "IP" : Internet Protocol

Not Subject to NDA

"IPV6"	:	Internet Protocol version 6
"IPV4V6"	:	Virtual <PDP_type> introduced to handle dual IP stack UE capability
"MAX"	:	Nothing is configured (IP or IPV6 or IPV4V6 according to +CGDCONT)

- Manual reboot is required after changing.
- Predefined default PDP type is dependent according to operator requirement.
- Predefined default PDP type that operator requested should not recommended to change.

AT#OVERRIDEPDP?

Read command returns the current settings for each defined context in the format:

#OVERRIDEPDP: <cid>,0:<PDP_type>,1:<PDP_type>

AT#OVERRIDEPDP=?

Test command returns values supported as a compound value.

Not Subject to NDA

A few operators require that the devices need to bring up PDN connections with the PDP type set as IPv6 or IP according to network type.

Profile 4 config to IPV6 only for LTE in home network and IP only for LTE in roaming network.

AT+CGDCONT=4,"IPV4V6","apn"

OK

AT#OVERRIDEPDP=4,0,"IPV6"

OK

AT#OVERRIDEPDP=4,1,"IP"

OK

AT#REBOOT

OK

TMO Firmware example

TMO Firmware is configured default PDP type such as.

AT#OVERRIDEPDP?

#OVERRIDEPDP: 1,0:"IPV6",1:"IP"

#OVERRIDEPDP: 2,0:"IPV6",1:"IP"

#OVERRIDEPDP: 3,0:"IPV6",1:"IP"

OK

To use profile 3 as IP for LTE in home network, need to set it as follows.

AT+CGDCONT=3,"IP","apn"

OK

AT#OVERRIDEPDP=3,0,"IP"

OK

Not Subject to NDA

AT#REBOOT

OK

Not Subject to NDA

3.2.2.44. AT#ENSSHD - Enable/disable the SSHD daemon

This command is used to enable/disable the SSHD daemon.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENSSHD=<mode>

Set Command to enable/disable the SSHD daemon.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	SSHD daemon mode Values: 0 : disable SSHD daemon 1 : enable SSHD daemon

NOTE: If the USB composition is not RNDIS(ECM), the SSHD daemon will not run.

NOTE: Rebooting with SSHD enabled will increase boot time by 5~10 seconds

AT#ENSSHD?

Read command returns the current operation in the following format:

 # ENSSHD: <operation>

...

OK

Not Subject to NDA

AT#ENSSHD=?

Test command reports the supported range of values

SSHD is the OpenSSH server process at Module internal AP. It listens to incoming connections using the SSH protocol and acts as the server for the protocol.

Not Subject to NDA

3.2.2.45. AT#HWREV - Hardware Identification

This command returns the device Hardware revision identification code.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#HWREV

Execution command returns the device Hardware revision identification code without command echo.

AT#HWREV=?

Test command returns the **OK** result code.

Not Subject to NDA

3.2.2.46. AT#TRACE - Enable/Disable Trace

The command selects which trace outputs you want to display through the debugging tool.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#TRACE=[<mode>[,<configurationString>]]

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	switches all trace outputs ON or OFF. If parameter **<mode>** is no entered in the command, the following **<configurationString>** will be used. Values: 0 : sets all trace outputs OFF, <configuration String> will be ignored 1 : sets all trace outputs ON, <configurationString> will be ignored
<configurationString>	string	-	enables/disables a set of trace outputs, its syntax is shown in the Additional info section.

Additional info:

- The syntax of the **<configurationString>** is:

  ["<unit>=<umode>[,<unit>=<umode>[,...]]"]

  Here are the meanings and values of the string parameters.

Not Subject to NDA

Name	Type	Default	Description
<unit>	string	N/A	trace class name available to the user to select the trace output. On the right side of each name, in lower case characters, there is the TC_XXX... string (Trace Class name) shown by the debugging tool.
	Values:		
	generic	:	TC_GENERIC
	socket	:	TC_SOCKET
	clock	:	TC_CLOCK
	pdp	:	TC_PDP
	gnss	:	TC_GNSS
	m2m_user	:	TC_M2M_USER
	fota	:	TC_FOTA
	fs	:	TC_FS
	qmi	:	TC_QMI
	sms	:	TC_SMS
	info	:	TC_INFO
	lwm2m	:	TC_LWM2M
	net	:	TC_NET
	sim	:	TC_SIM
	spi	:	TC_SPI
	usb	:	TC_USB

Not Subject to NDA

	nv : TC_NV rtc : TC_RTC m2m_uart : TC_UART power : TC_POWER ftpc : TC_FTPC ati : TC_ATI backup : TC_BACKUP nipd : TC_NIPD sys : TC_SYS psm : TC_PSM ssl : TC_SSL		
<umode>	string	N/A	enables/disables the trace output selected Values: 0 : disables 1 : enables

AT#TRACE?

Read command reports the currently selected parameter values in the format:

#TRACE: "<unit>=<umode>,...,<unit>=<umode>"

AT#TRACE=?

Test command returns **OK**

Not Subject to NDA

Here are some examples:

- Set all trace outputs OFF

  AT#TRACE=0

  OK

  Set all trace outputs ON

  AT#TRACE=1

  OK

  Enable/disable trace outputs selected

  AT#TRACE=,"generic=1,clock=0,lwm2m=1,pdp=0,gnss=0,ati=0"

  OK

Not Subject to NDA

3.2.2.47. AT#DHCPV6DELEGATION - DHCPV6 Delegation Mode Set

DHCPv6 Delegation Mode Set

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#DHCPV6DELEGATION=<cid>,<mode>

Set command specifies the DHCPv6 delegation mode on profile.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	PDP context identifier Value: 1÷max : specifies a particular PDP context definition (see +CGDCONT command)
<mode>	integer	0	multiplexer transparency mechanism Values: 0 : disable 1 : enable

mode can be set when profile exists.

this command only supports to LE910Cx-EU, LE910C1-EUX.

AT#DHCPV6DELEGATION?

Read command returns the current value of **<cid>,<mode>** parameter.

Not Subject to NDA

#DHCPV6DELEGATION: <cid>,<mode>

...

#DHCPV6DELEGATION: <cid>,<mode>

AT#DHCPV6DELEGATION=?

Test command returns the range of supported values for parameter.

Not Subject to NDA

3.2.2.48. AT#PSMRI - Power Saving Mode Ring Indicator

The command enables or disables the Ring Indicator pin response to an URC message while modem is in power saving mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Common profile	No	-	2

AT#PSMRI=<n>

Set command enables/disables the Ring Indicator pin response to an URC message while modem is in power saving mode. If enabled, a negative going pulse is generated, when URC message for specific event is invoked. The duration of this pulse is determined by the value of <n>.

Parameter:

Name	Type	Default	Description
<n>	integer	0	disables, enables/sets duration of the generated pulse.

Values:

0 : disables RI pin response for URC message

50÷1150 : enables RI pin response for URC messages with a duration specified in ms

the behavior for #PSMRI is invoked only when modem is in sleep mode (**AT+CFUN**=5 and DTR Off on Main UART).

AT#PSMRI?

Read command reports the duration in ms of the pulse generated, in the format:

Not Subject to NDA

#PSMRI: <n>

AT#PSMRI=?

Test command reports the supported range of values for parameter **<n>**

When RING signal for incoming call/SMS/socket listen is enabled, the behavior for **#PSMRI** will be ignored.

Not Subject to NDA

3.2.2.49. AT+CSCS - Select TE Character Set

This command sets character-set used by the device.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CSCS=[<chset>]

Set command sets character-set used by the device.

Parameter:

Name	Type	Default	Description
<chset>	string	IRA	character set

Values:

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.

Not Subject to NDA

AT+CSCS=?

Test command returns the supported values for parameter **<chset>**.

Not Subject to NDA

3.2.2.50. AT#CSCSEXT - Select GSM Hexadecimal Representation

Set commands enable/disable the hexadecimal characters representation.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT#CSCSEXT=<mode>

Set commands enable/disable the hexadecimal characters representation while character set, one selected with **+CSCS**, is GSM. (For example, 4142 equals two 7-bit characters with decimal values 65,66).

Parameter:

Name	Type	Default	Description
<mode>	integer	0	HEX representation enable/disable Values: 0 : Disable 1 : Enable

AT#CSCSEXT?

Read command returns the current value of the <**mode**> parameter.

AT#CSCSEXT=?

Test command returns the supported values for parameter <**mode**>.

Not Subject to NDA

```
AT+CSCS=?
+CSCS: ("GSM","IRA","8859-1","PCCP437","UCS2")

OK

AT+CSCS="GSM"
OK

AT#CSCSEXT?
#CSCSEXT: 0

OK

AT+CPBW=1,"8475763000",129,"Lin Zhao"
OK

AT+CPVR=1
+CPBR: 1,"8475763000",129,"Lin Zhao","","",0,"",""

OK

AT+CMGW=8475763000
> test #CSCSEXT
+CMGW: 8

OK

AT+CMGR=8
+CMGR: "STO UNSENT","8475763000","Lin Zhao"
test #CSCSEXT

OK

AT#CSCSEXT=1
OK

AT+CPBR=1
+CPBR: 1,"8475763000",129,004C006E006E0020005A00680061006F

OK

AT+CMGR=8
+CMGR: "STO
UNSENT","38343735373633303030","004C006E006E0020005A00680061006F"
74657374202343534353455855420

OK
```


Not Subject to NDA

3.2.2.51. AT+PACSP - Network Selection Menu Availability

This command returns the current value of the <mode> parameter which is PLMN mode bit in the CSP file with SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+PACSP?

Read command returns the current value of the <**mode**> parameter in the format:

+PACSP<mode>

Additional info:

▶▶ Read command response parameter

Name	Type	Default	Description
<mode>	integer	N/A	returns the PLMN mode bit (in CSP file on the SIM) Values: 0 : restriction of menu option for manual PLMN selection 1 : no restriction of menu option for Manual PLMN selection

It can support only AT&T specific module.

AT+PACSP=?

Not Subject to NDA

Test command returns the **OK** result code.

Not Subject to NDA

3.2.2.52. AT+CMUX - Multiplexing Mode

This command is used to enable/disable the multiplexing protocol control channel.

GSM 07.07, GSM 07.10

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>]]]

Set command is used to enable/disable the multiplexing protocol control channel.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	basic option is currently the only supported mode. Value: 0 : basic option mode
<subset>	integer	N/A	UIH frames used only; it is currently the only supported value. Value: 0 : UI frames used only
<port_speed>	integer	1	transmission rate (fixed with 1 and changes do not affect the actual behavior. dummy value) Values: 1 : 9600 bps

Not Subject to NDA

2 : 19200 bps

3 : 38400 bps

4 : 57600 bps

5 : 115200 bps

6 : 230400 bps

<N1>	integer	122	maximum frame size

Value:

1÷1500 : maximum frame size

Additional info:

- For models with the M2M AT Parser support, two command sets are provided depending on the activation status of the M2M AT Parser.

  AT#M2MATP=0 (M2M AT Parser disabled) - only **<mode>** and **<subset>** parameters are supported.

  AT#M2MATP=1 (M2M AT Parser enabled) - **<mode>, <subset>,<port_speed>,<N1>** parameters are supported.

- For M2M AT Parser not supported model, only **<mode>** and **<subset>** parameters are supported.

Note: after entering the *Multiplexed Mode* an inactive timer of five seconds starts. If no CMUX control channel is established before this inactivity timer expires the engine returns to *AT Command Mode*

Note: all the CMUX protocol parameter are fixed as defined in GSM07.10 and cannot be changed.

Not Subject to NDA

Note: the Length Indicator of the information field is fixed to 1 octet.

Note: E/A Bit of the Length Indicator should be set to 1 (length <= 127).

AT+CMUX?

Read command returns the current value of **<mode>** and **<subset>**

parameters, when M2M AT Parser disabled (**AT#M2MATP=0**) or M2M AT Parser not supported model in the format:

+CMUX: <mode>,<subset>

Read command returns the current value of **<mode>, <subset>, <port_speed>** and **<N1>**

parameters, when M2M AT Parser enabled (**AT#M2MATP=1**) in the format:

+CMUX: <mode>,<subset>,<port_speed>,<N1>

AT+CMUX=?

Test command returns the range of supported values for parameters

<mode> and **<subset>** when M2M AT Parser disabled (**AT#M2MATP=0**) or M2M AT Parser not supported model.

Test command returns the range of supported values for parameters

<mode>, <subset>, <port_speed> and **<N1>**. when M2M AT Parser disabled (**AT#M2MATP=1**).

Not Subject to NDA

3.2.2.53. AT#CMUXMODE - CMUX Mode Set

The module is equipped with the CMUX standard protocol to provide multiplexing features. The #CMUXMODE command configures the CMUX behavior concerning the DTR control line, and the size of the internal output CMUX buffer.

3GPP TS 27.010

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CMUXMODE=<mode>

Set command specifics the CMUX mode

Parameter:

Name	Type	Default	Description
<mode>	integer	0	defines the DCE behavior when a transition occurs on the physical DTR control line.

Values:

0 : Ignore DTR feature is disabled, a transmission of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode

1 : Ignore DTR feature is disabled, a transmission of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode

5 : Ignore DTR feature is enabled, the DCE doesn't care the physical DTR line transitions

Not Subject to NDA

Note: DLC establishment on Virtual Channel between mode 0 and mode 1 is different. See Telit Multiplxer SW User Guide for the detailed information

Note: a software or hardware reset restores the default value.

Note: during cmux session the set command will return **ERROR,** only the read and test command can be used.

Note: All **CMUXMODE** command will have no effect when M2M AT Parser enabled (**AT#M2MATP=1**).

AT#CMUXMODE?

Read command returns the current value of **<mode>** parameter.

+CMUXMODE: <mode>

AT#CMUXMODE=?

Test command returns the range of supported values for parameter **<mode>**

Not Subject to NDA

3.2.2.54. AT#USBCFG - USB Configuration

USB Composition Configuration

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#USBCFG=<composition>

Set the USB composition

Parameter:

Name	Type	Default	Description
<composition>	integer	-	Composition number for each PID. Refer to an 'Additional info' chapter for detailed composition number.

Additional info:

LE910Cx Linux Products:

Composition	PID	Functions
0	0x1201	DIAG+ADB+RmNet+NMEA+MODEM+MODEM+SAP
1	0x1203	RNDIS+DIAG+ADB+NMEA+MODEM+MODEM+SAP
2	0x1204	DIAG+ADB+MBIM+NMEA+MODEM+MODEM+SAP
3	0x1205	MBIM
4	0x1206	DIAG+ADB+ECM+NMEA+MODEM+MODEM+SAP
5	0x1250	RmNet+NMEA+MODEM+MODEM+SAP
6	0x1251	RNDIS+NMEA+MODEM+MODEM+SAP

Not Subject to NDA

7	0x1252	MBIM+NMEA+MODEM+MODEM+SAP
8	0x1253	ECM+NMEA+MODEM+MODEM+SAP
9	0x1254	MODEM+MODEM
10	0x1255	NMEA+MODEM+MODEM+SAP
11	0x1230	DIAG+ADB+RmNet+AUDIO+NMEA+MODEM+MODEM+SAP
12	0x1231	RNDIS+DIAG+ADB+AUDIO+NMEA+MODEM+MODEM+SAP
13	0x1260	DIAG+ADB+RmNet+NMEA+MODEM+MODEM+SAP
14	0x1261	DIAG+ADB+RmNet+NMEA+MODEM+MODEM+SAP
15	0x1262	DIAG+ADB+RmNet+NMEA+MODEM+MODEM+AUX

LE910Cx ThreadX Products:

Composition	PID	Functions
0	0x1031	DIAG+MODEM+MODEM+RmNet
1	0x1033	DIAG+MODEM+MODEM+ECM
2	0x1034	MODEM+MODEM+RmNet
3	0x0135	MODEM+MODEM+ECM
4	0x1036	MODEM+MODEM
5	0x1037	DIAG+SER+MODEM+MODEM+RmNet
6	0x1038	SER+MODEM+MODEM+RmNet

▶▶The modem device is reset automatically, and new USB composition applied from the next boot up time.

▶▶If trying to set the same composition as currently set the command will return error.

Not Subject to NDA

▶▶If the new composition was set successfully the command will return OK.

If composition settings failed the command will return error.

▶▶Default value for USB composition is 0x1201, **AT#USBCFG?** will return 0 by default.

If **USBCFG** is 3, it is MBIM only mode. For that reason, you can't change the USB composition. If you want to change the USB composition, please use Main UART or refer to "3.2.13. USB Interface" in SW User Guide document.

USB compositions 0x1260 and 0x1261 are compositions for Wi-Fi bundling and this USB compositions are not supported in LE910C1-SV/ST/SA.

PID_0x1262 is not supported in LE910C1-SV/ST/SA.

The value is stored when Set command executed and it is kept even on firmware download case.

The SER interface of 0x1037 and 0x1038 PIDs for LE910Cx ThreadX Products could be used only for m2mb application.

This interface isn't mapped with AT channel.

m2m application can use this SER interface with "/dev/usb2" path.

AT#USBCFG?

Returns the current composition set by number as detailed in the section above:

LE910Cx Linux Products:

Not Subject to NDA

0x1201 composition file returns 0

0x1203 composition file returns 1

0x1204 composition file returns 2

0x1205 composition file returns 3

0x1206 composition file returns 4

0x1250 composition file returns 5

0x1251 composition file returns 6

0x1252 composition file returns 7

0x1253 composition file returns 8

0x1254 composition file returns 9

0x1255 composition file returns 10

0x1230 composition file returns 11

0x1231 composition file returns 12

0x1260 composition file returns 13

0x1261 composition file returns 14

0x1262 composition file returns 15

LE910Cx ThreadX Products:

0x1031 composition file returns 0

0x1033 composition file returns 1

0x1034 composition file returns 2

0x1035 composition file returns 3

0x1036 composition file returns 4

0x1037 composition file returns 5

0x1038 composition file returns 6

AT#USBCFG=?

Test command returns all supported values of the parameters **<composition>**

Not Subject to NDA

3.2.2.55. AT#EXCEPINFO - Read exception information

This command reports the stored exception information.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#EXCEPINFO=<index>

Write command for clear the stored exception information. All the stored information will be cleared if this command entered.

Parameter:

Name	Type	Default	Description
<index>	integer	N/A	index of the information Value: 0 : clear the stored exception information

AT#EXCEPINFO?

Read command that reports the stored exception information, in the format:

#EXCEPINFO: <index>,<sw_ver>,<date>,<time>,<line>,<file>,<msg>

Parameters:

<index>: Integer type, index of the information.

<sw_ver>: String type. Stored software version name information.

<date>: String type, stored date information.

<time>: String type, stored time information. (UTC time. Not local time)

<line>: Integer type, stored line number information.

<file>: String type, stored file name information.

Not Subject to NDA

<msg>: String type, stored exception message information.

5. The exception information will be stored up to 5 and will be deleted from the old one when there is new exception.
6. If the exception triggered before module get the time information from network, the <date> and <time> can be wrong value.
7. This exception information only can be used for the purpose to check there was exception has been happened. The debug process needs full memory dump same as before.

AT#EXCEPINFO=?

Test command returns with below format :

#EXCEPINFO: (0)

OK

Not Subject to NDA

3.2.2.56. AT#RESETINFO - Read reason for most recent devices reset or power-down

This command used to get RESET INFO that has reason for most recent devices reset.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#RESETINFO

Execution command return last reset reason in the following format

RESETINFO: <reset type>

OK

<reset type>

0 - unknown

1 - warm: (e.g. reset from reboot command)

2 - hard: (e.g. reset from power key or reset line)

3 - crash: (e.g. reset due to module crash)

AT#RESETINFO

RESETINFO: 2

OK

Not Subject to NDA

3.2.2.57. AT#PORTCFG - Connect Physical Ports to Service Access Points

This command allows to connect Service Access Points (software anchorage points) to the external physical ports.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#PORTCFG=<Variant>

Set command allows to connect Service Access Points to the external physical ports giving a great flexibility. Examples of Service Access Points: AT Parser Instance #1, #2, #3, etc...

Parameter:

Name	Type	Default	Description
<Variant>	integer	14	set port configuration. A short description, for each <**Variant**> value, is reported in test command section. The range depends on the product.

Value:

0÷max : see test command section

- To enable the set port configuration, the module must be rebooted.
- In LE910C1-SV/ST/SA/EUX/SAX/SVX and LE910Cx-WWX, the Variant 16 is not supported.
- The default value of parameter **<Variant>** is 16 in LE910C1-EU/NF/LA (4G+2G).
- Variant 17 is supported for only LE910C1-EUX/SAX/SVX and LE910Cx-WWX.

Not Subject to NDA

AT#PORTCFG?

Read command returns the requested and the active port configuration in the format:

#PORTCFG: <requested>,<active>

Additional info:

- Parameters returned by the read command, in format:

  #PORTCFG: <requested>,<active>

Name	Type	Default	Description
<requested>	integer	-	value showing the requested configuration that will be activated on the next power ON.
<active>	integer	-	value showing the actual configuration.

AT#PORTCFG=?

Test command returns a brief description of the supported ports arrangement solutions.

For each <**Variant**> are reported, on one row, the logical connections between a physical port (USIF0, USB0, etc.) and a Service Access Point (AT#1, AT#2, etc.).

The test command returns, for example, the following message:

AT#PORTCFG=?
#PORTCFG: Variant=0: AT= USIF0 USB0 USB1
#PORTCFG: Variant=3: AT= USIF0 USIF1 USB0
#PORTCFG: Variant=8: AT= USB0 USB1
#PORTCFG: Variant=11: AT= USIF0 USB0 USB1; NMEA= USIF1
#PORTCFG: Variant=14: AT= USIF0 USIF1 USB0 USB1
#PORTCFG: Variant=15: AT= USIF0 USB0 USB1; CONSOLE= USIF1
#PORTCFG: Variant=16: AT= USIF0 USB0 USB1; BT= USIF1

Not Subject to NDA

#PORTCFG: Variant=17: AT= USIF0 USB0 USB1; SPI= USIF1

OK

The **<Variant>** range depends on the product.

Not Subject to NDA

3.2.2.58. AT#ATDELAY - AT Command Delay

This command sets a delay in second for the execution of successive AT command.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ATDELAY=<delay>

Set command sets a delay in second for the execution of successive AT command.

Parameter:

Name	Type	Default	Description
<delay>	integer	0	delay interval

Value:

0÷max : delay expressed in 100 milliseconds intervals; 0 means no delay. For max value refer to test command

<delay> is only applied to first command executed after **#ATDELAY**

AT#ATDELAY?

Read command reports the currently selected parameter in the format:

#ATDELAY: <delay>

AT#ATDELAY=?

Test command returns the supported range of values for parameter **<delay>**.

Not Subject to NDA

Set 5 seconds delay for "AT#GPIO=1,1,1" command

```
AT#GPIO=1,0,1;#ATDELAY=50;#GPIO=1,1,1
OK
```


Not Subject to NDA

3.2.2.59. AT#CMAR - Selective Master Reset

This AT command is used to reset user data to factory default on Modem NV and AP AppZone file system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CMAR=<unused>[,<resetType>]

Set command resets user data. The user data on Modem NV and AP AppZone file system will be reset to default.

Parameters:

Name	Type	Default	Description
<unused>	integer	0	this parameter is not really used, and it is present only for backward compatibility. Value: 0 : dummy parameter
<resetType>	integer	0	the user can select which kind of format to perform; if omitted, the command performs a complete format. Values: 0 : format all 1 : format Modem NV 3 : format AP AppZone file system

If parameter **<resetType>** is omitted, the command has the same behavior as **AT#CMAR=0,0**.

Not Subject to NDA

This command will just reset user files in **"/mod"** directory for AP AppZone file system.

After the execution is done, the module will automatically reboot.

AT#CMAR=?

Test command returns **<unused>** value and **<resetType>** values.

Not Subject to NDA

3.2.2.60. AT&Z - Store Telephone Number in the Internal Phonebook

The command stores a telephone number in the internal phonebook.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&Z<n>=<nr>

Execution command stores the telephone number <nr> in the record <n>.

Parameters:

Name	Type	Default	Description
<n>	integer	N/A	phonebook record Value: 0÷9 : record number
<nr>	string	-	telephone number (maximum length 24 digits)

The module has a built-in non-volatile memory where 10 telephone numbers can be stored, each one having a maximum of 24 digits.

The records cannot be overwritten and must be cleared before rewriting. To delete the record <n>, issue the command AT&Z<n>=<CR>.

The records in the module memory can be viewed with the command &N, and the phone number stored in record <n> can be dialed using the ATDS=<n>.

Not Subject to NDA

3.2.2.61. AT&N - Display Internal Phonebook Stored Numbers

The command displays telephone numbers stored in the internal phonebook.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&N[<n>]

Execution command returns the telephone number stored at the **<n>** position in the internal memory.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	phonebook record number
	Value:		
	0÷9 :		phonebook record number

If parameter **<n>** is omitted, then all the internal records are shown.

Not Subject to NDA

3.2.2.62. AT#Z - Extended Reset

This command loads both base section and extended section.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#Z=<profile>

Set command loads both base section and extended section of the specified user profile stored with **AT&P**.

Parameter:

Name	Type	Default	Description
<profile>	integer	0	Parameter to select the user profile Values: 0 : user profile 0 1 : user profile 1

AT#Z=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.63. AT&V2 - Display Last Connection Statistics

The command displays last connection statistics.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&V2

Execution command returns the last connection statistics and connection failure reason.

Example of connection statistics get with no connection and no error.

- AT&V2

```
TOTAL CONNECTION TIME          : 0:00:00
CONNECTION FAILURE REASON      : powered off

OK
```


Not Subject to NDA

3.2.2.64. AT#IMEISV - Request IMEI and Software Version Number

This command returns the International Mobile Station Equipment Identity and Software Version Number.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#IMEISV

Execution command returns the International Mobile Station Equipment Identity and Software Version Number, identified as the IMEISV of the module.

Additional info:

- 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.

Not Subject to NDA

3.2.2.65. AT&V0 - Display Current Configuration and Profile

The command displays current modem configuration and profile.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&V0

Execution command returns all the modem configuration parameters settings.

This command is the same as **&V**, it is included only for backwards compatibility.

The row of information about CTS (C106) OPTIONS is in the output of **&V0** only for compatibility reasons and represents only a dummy value.

Not Subject to NDA

3.2.2.66. AT#FWSWITCH - Set Active Firmware Image

Set command allows enabling one configuration of the firmware configurations embedded on product.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#FWSWITCH=<net_conf>[,<storage_conf>[,<restore_user_conf>]]

Set command allows enabling one configuration of the firmware configurations embedded on product.

Parameters:

Name	Type	Default	Description
<net_conf>	integer	-	Network config to be enabled Test command show the supported **<net_conf>** values range. Please, refer to the table in Additional info section where is also described **<net_conf>** list and the default values depend on the products
<storage_conf>	integer	0	Selects storage configuration. It's a dummy parameter for the backward compatibility with the legacy products. Values: 0 : save the <configNumber> value in RAM 1 : save the <configNumber> value in NVM

Not Subject to NDA

<restore_user_conf>	integer	0	backup current user config and restore new user config

Values:

0 : After reboot, new network config restored

1 : Backup current user config and after reboot, new user config and network config restored

Additional info:

- **<net_conf>** identifies the network config as shown in the following table.

Product	Network Config	default value
LE910Cx-NF	0 = AT&T, 1 = Verizon, 2 = T-Mobile	0
LE910Cx-AP	10 = NTT Docomo, 11 = Telstra, 12 = KDDI, 13 = Softbank, 14 = Vodafone New Zealand	10
LE910C4-CN	20 = China Mobile, 21 = China Unicom, 22 = China Telecom	20
LE910C1-NS	30 = Sprint, 31 = SouthernLINC	30
LE910Cx-WWX	0 = AT&T, 1 = Verizon, 3 = Bell, 4 = Telus, 40 = Global	0

Not Subject to NDA

⚠ This AT command is available on LE910Cx-NF, LE910Cx-AP, LE910Cx-CN, LE910C1-NS, LE910Cx-WWX and LE910Cx-AP (SW version 25.20.28x and 25.20.68x). Especially, LE910C1-AP only for Telstra config don't support this AT command.

ℹ This AT command performs a system reboot and factory restore.

ℹ **<storage_conf>** setting value has no effect on firmware configuration. It's only for the backward compatibility.

ℹ A current activated **<net_conf>** maintained, even if new firmware updated and factory default value restored. For example, in case of current **<net_conf>** is VZW, VZW config maintained when updating new firmware.

ℹ If **<restore_user_conf>** parameter is set to 1, current user config is stored before reboot, and then new user config restored on new configuration at boot time. User config is stored and restored separately per network config. User config indicates setting values for the specific AT command set, which are listed as below:

+CGDCONT, +WS46, +COPS, #BND, #AUTOBND, #ENS, #SCFG, #ENHSIM, #ICMP, #SMSMODE, #DNS, #SCFGEXT, #SSLCFG, #SSLSECCFG, #SSLSECDATA, #SSLEN, #SGACTCFG, #SGACTCFGEXT, #SCFGEXT2, #HTTPCFG, #SCFGEXT3, #SMTPCFG, #PROTOCOLCFG

ℹ Softbank configuration is not available on .xx8 official version and older version for commercial.

ℹ 25.21.xx1 for LE910Cx-AP (Japan) support 3 network configs (10 = NTT Docomo, 12 = KDDI, 13 = Softbank)

AT#FWSWITCH?

Read command reports the current active firmware image:

#FWSWITCH: **<net_conf>,<storage_conf>,<restore_user_conf>**

Not Subject to NDA

AT#FWSWITCH=?

Test command reports the range of supported values for parameters **<configNum>, <storageNum>**, <restore_user_conf>.

Switch to configuration 1-VZW:

```
AT#FWSWITCH =1
OK
```

Store current user config - 0 for network config 0 - AT&T, and restore user config - 1 on new newwork config 1 - VZW on next boot time:

```
AT#FWSWITCH =1,0,1
OK
```


Not Subject to NDA

3.2.2.67. AT#FWAUTOSIM - Automatic Carrier Switch By SIM

This command is the functionality for automatic carrier switch by SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#FWAUTOSIM=<mode>

Set command sets automatic carrier switch enable mode by SIM.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	automatic carrier switch mode by SIM Values: 0 : Disable automatic carrier switch by SIM 1 : Enable automatic carrier switch by SIM 2 : Enable one-shot automatic carrier switch by SIM

If automatic carrier switch mode is enabled, the **#FWSWITCH** command will return **ERROR**.

This AT command is available on LE910Cx-NF, LE910Cx-CN, LE910C1-NS, LE910Cx-AP and LE910Cx-WWX. LE910C1-AP only for Telstra config don't support this AT command.

AT#FWAUTOSIM?

Read command reports the current stored <**mode**>.

#FWAUTOSIM: <mode>

Not Subject to NDA

Additional info:

- automatic carrier switch mode by SIM

Name	Type	Default	Description
<mode>	integer	N/A	automatic carrier switch mode by SIM Values: 0 : Disable automatic carrier switch by SIM 1 : Enable automatic carrier switch by SIM 2 : Enable one-shot automatic carrier switch by SIM 3 : Waiting enable one-shot automatic carrier switch by SIM

AT#FWAUTOSIM=?

Test command reports the supported range of values for parameter **<mode>**.

#FWAUTOSIM: (0-2)

Not Subject to NDA

3.2.2.68. AT#SECIFCFG - Secure Interface Configuration

This command allows to set the interface secured and non-secured.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SECIFCFG=<sec_mask>,<pwd>

Set command set the interface secured and non-secured.

Parameters:

Name	Type	Default	Description
<sec_mask>	integer	0	secure mask value Values: 0 : No secure interface (No secure on all interface) 1 : Serial AT interface (Secure AT access via USB, UART) 2 : Remote AT interface (Secure AT access via TCP/IP, SMS) 3 : Serial and Remote AT interface (Secure AT access via USB, UART, TCP/IP, SMS)
<pwd>	string	-	The credentials are 10 ~ 16 characters and alphanumeric with capitals complexity.

Additional info:

- Once Interface secure enabled, all AT command is not available except for secure AT commands **#SECIFCFG**, **#SECIFAUTH** and **#SECIFPWD** until interface access is authenticated.

Not Subject to NDA

Need to reboot for new configuration.

Default password is "0123456789".

AT#SECIFCFG?

Read command returns the values in the following format:

#SECIFCFG: <sec_mask>
0 : No secure interface (No secure on all interface : default)
1 : Serial AT interface (secure AT access via USB, UART)
2 : Remote AT interface (secure AT access via TCP/IP, SMS)
3 : Serial and Remote AT interface (Secure AT access via USB, UART, TCP/IP, SMS)

Ex)
AT#SECIFCFG?
#SECIFCFG: 1

OK

AT#SECIFCFG=?

Test command returns the range of supported values for all the parameters.

AT#SECIFCFG=?
#SECIFCFG: (0-3),(10-16)

OK

Password is not displayed.

Not Subject to NDA

3.2.2.69. AT#SECIFAUTH - Secure Interface Authentication

This command will be gotten an authentication with password.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SECIFAUTH=<pwd>

This command will be gotten an authentication with password.

Parameter:

Name	Type	Default	Description
<pwd>	string	-	The credentials are 10 ~ 16 characters and alphanumeric with capitals complexity.

Default password is “0123456789”.

AT#SECIFAUTH?

Read command returns the values in the following format:

#SECIFAUTH: <current authentication status>
0 : No authentication requirement
1 : Require authentication
2 : Authenticated

Ex)
AT#SECIFAUTH?
#SECIFAUTH: 1

OK

AT#SECIFAUTH=?

Not Subject to NDA

Test command returns the range of supported values for all the parameters.

AT#SECIFAUTH=?
#SECIFAUTH: (10-16)

OK

Not Subject to NDA

3.2.2.70. AT#SECIFPWD - Secure Interface Password

This command can change authentication password.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SECIFPWD=<old_pwd>,<new_pwd>,<new_pwd>

This command can change authentication password. New password needs twice with the same value.

Parameters:

Name	Type	Default	Description
<old_pwd>	string	-	The credentials are 10 ~ 16 characters and alphanumeric with capitals complexity.
<new_pwd>	string	-	The credentials are 10 ~ 16 characters and alphanumeric with capitals complexity.
<new_pwd>	string	-	The credentials are 10 ~ 16 characters and alphanumeric with capitals complexity.

Default password is "0123456789".

AT#SECIFPWD=?

Test command returns the range of supported values for all the parameters.

AT#SECIFPWD=?
#SECIFPWD: (10-16),(10-16),(10-16)

Not Subject to NDA

OK

Not Subject to NDA

3.2.2.71. AT#CLATENA - Enable/Disable the CLAT interface

Enable/Disable the CLAT interface.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#CLATENA=<cid>,<enable>

This command is used to enable/disable the Modem CLAT(Customer-side Address Translator) functionality to support communication to IPv4 servers on IPv6 only cellular networks.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	(PDP Context Identifier) numeric parameter which specifies a particular PDP context definition. Value: 1÷max : where the value of max is returned by the Test command
<enable>	integer	0	enable or disable CLAT Values: 0 : disable CLAT interface 1 : enable CLAT interface

AT#CLATENA?

Read command returns the current settings for each defined context in the format:

Not Subject to NDA

#CLATENA: <cid>,<enable>

AT#CLATENA=?

Test command returns values supported as a compound value.

AT#CLATENA=1,1
OK
AT#CLATENA?
#CLATENA: 1,1
#CLATENA: 2,0
#CLATENA: 3,0
OK

Not Subject to NDA

3.2.2.72. AT#CQI - HSDPA Channel Quality Indication

This command returns the channel quality indication of the <mode> parameter which is PLMN mode bit in the CSP file with SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CQI

Execution command indicates channel quality indication in the form:

#CQI: <cqi>

Additional info:

- CQI values:

Name	Type	Default	Description
<cqi>	integer	N/A	Channel Quality indication

Values:

0÷30 : The value range for WCDMA. 1 (worst) – 30 (best)

0÷15 : The value range for LTE. 1 (worst) – 15 (best)

0 : out of range

31 : Unknown or not detectable

AT#CQI=?

Not Subject to NDA

Test command returns the supported range of values of the parameter **<cqi>**.

Will only work while socket is open and data transfer is active.

Working only with UTRAN and E-UTRAN (see +**WS46**).

Not Subject to NDA

3.2.2.73. AT#FRATTRIGGER - Configure FRAT Trigger parameter

This command sets the parameter needed to trigger the FRAT.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#FRATTRIGGER=<gpio_pin>[,<trigger_value>]

This command sets the parameter needed to trigger the FRAT.

Parameters:

Name	Type	Default	Description
<gpio_pin>	integer	0	Numeric parameter that selects how to get the frat_trigger value. Values: 0 : gets the frat_trigger value from <trigger_value>. 1÷10 : gets the frat_trigger value from TGPIO #<gpio_pin>.
<trigger_value>	integer	1	numeric parameter which selected how to trigger the FRAT. Values: 0 : slow trigger 1 : fast trigger

<gpio_pin> is attached to ALT8 func (see **AT#GPIO**).

<gpio_pin> is save to NVM.

Not Subject to NDA

- <gpio_pin> default is 0.
- <trigger_value> default is 1.
- <trigger_value> will reset to default in each power up.
- It can support only AT&T specific module.

AT#FRATTRIGGER?

Read command returns the current settings for the frat trigger:

#FRATTRIGGER: <gpio_pin>,<trigger_value>

AT#FRATTRIGGER=?

Test command returns the supported range of parameters <gpio_pin>,<trigger_value>

Not Subject to NDA

3.2.2.74. AT#PDPAUTH - PDP Authentication Parameters

This set command specifies PDP authentication parameters values for a PDP context identified by the (local) context identification parameter <**cid**>.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PDPAUTH=<cid>,<auth_type>,[<username>,[<password>]]

Set command specifies PDP authentication parameters values for a PDP context identified by the (local) context identification parameter **<cid>**.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	context identifier Value: 1÷max : specifies a particular PDP context definition. The value of max is returned by the Test command.
<auth_type>	integer	0	authentication type Values: 0 : no authentication 1 : PAP authentication 2 : CHAP authentication
<username>	string	-	supplied by network provider. Required for **<auth_type> = 1 and 2**
<password>	string	-	supplied by network provider. Required for **<auth_type> = 1 and 2.**

Not Subject to NDA

AT#PDPAUTH?

Read command returns the PDP authentication parameters, excluding <password>, set for every PDP, in the format:

#PDPAUTH: <cid1>,<auth_type1>,<username1><CR><LF>

...

#PDPAUTH:<cidmax>,<auth_typemax>,<usernamemax><CR><LF>]]

AT#PDPAUTH=?

Test command reports the supported range of values for parameters **<cid>** and **<auth_type>** and the maximum allowed length of the string parameters **<password>** and **<username>.**

Not Subject to NDA

3.2.2.75. AT#TXCAL4G - Change Max TX Power Level for a Supported Band

This command changes the maximum power level for the specified band.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TXCAL4G=<band>[,<txPwrLev>]

Set command changes the tx power level for the specified band.

Parameters:

Name	Type	Default	Description
<band>	integer	-	number of the LTE band whose TX maximum power level must be changed. To know its range, use Test command.
<txPwrLev>	integer	230	maximum TX power level for the band specified, in 1/10dBm (230 = 23dBm). To know its range, use Test command. If <**txPwrLev**> is not specified, the default value for maximum TX power level is set for the band <**band**> Value: 180÷250 : maximum power level

<txPwrLev> input resolution is dBm10.(Qualcomm limitation)

LTE band 71 doesn't support resolution dBm10.(Qualcomm limitation)

After command set, you have to reboot modem.

Not Subject to NDA

AT#TXCAL4G?

Read command returns the bands supported and the maximum power level set for each band in the format:

#TXCAL4G: <band>,<txPwrLev>
#TXCAL4G: <band>,<txPwrLev>
#TXCAL**4G**: <band>,<txPwrLev>
#TXCAL**4G**: <band>,<txPwrLev>
#TXCAL**4G**: <band>,<txPwrLev>
...

AT#TXCAL4G=?

Test command reports the supported range of parameters values.

LTE band 71 doesn't support resolution dBm10.

- AT#TXCAL4G=71,232

  ERROR

  AT#TXCAL4G=71,230

  OK

Not Subject to NDA

3.2.2.76. AT#TXCAL - TX Calibration

This command change the Tx power level for the band specified.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TXCAL=<band>[,<value1>,<value2>,.....<value16>]

Set command change the Tx power level for the band specified.

Parameters:

Name	Type	Default	Description
<band>	integer	N/A	numeric parameter indicating the band. Values: 0 : GSM 850 1 : GSM 900 2 : DCS 1800 3 : PCS 1900

The set command (**AT#TXCAL=<bnd>**) causes the values for **<bnd>** band to reuse the default ones

After command set, you have to reboot modem.

AT#TXCAL?

Read command returns the current parameter settings for each band in the format:

#TXCAL: <value_1>,<value_2>,....,<value_16>

#TXCAL: <value_1>,<value_2>,....,<value_16>

Not Subject to NDA

#TXCAL: <value_1>,<value_2>,....,<value_16>

#TXCAL: <value_1>,<value_2>,....,<value_16>

AT#TXCAL=?

Test command reports the supported range of parameters values.

Not Subject to NDA

3.2.2.77. AT#CIND - Indication Control Reader Indication

This command gets the Indicator Control for current values.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CIND?

Read command returns the current values of **+CIND**, in the format.

#CIND: <cind_ind>,<cind_ind>,...<cind_ind>

Additional info:

- **<cind_ind>** - cind current set value according to the index of **+CIND** command

  0 - unset

  1 - set

AT#CIND=?

Test command returns the supported range of values for the **+CIND** set **<cind_ind>**

Not Subject to NDA

Next command changed the **+CIND** values:

AT+CIND=1,0,1,0,0,1,0,1,1,0,0

Next command to query the current value of all indicators:

AT#CIND?

#CIND:1,0,1,0,0,1,0,1,1,0,0

OK

Not Subject to NDA

3.2.2.78. AT#TID - Request Telit ID

The command returns Telit ID and version number.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#TID

Execution command returns device Telit ID and version number separated by a comma, followed by an **OK** at newline.

AT#TID=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.79. AT+IMEISV - Request IMEI and Software Version Number

This command returns the International Mobile Station Equipment Identity and Software Version Number.

3GPP TS 23.003

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+IMEISV

Execution command returns the International Mobile Station Equipment Identity and Software Version Number, identified as the IMEISV of the module.

Additional info:

- 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.

Not Subject to NDA

3.2.2.80. AT#CGMM - Request Model Identification

This command returns the device model identification.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CGMM

Execution command returns the device model identification code, with command echo.

AT#CGMM
#CGMM: <code>

OK

AT#CGMM=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.2.81. AT#IMSPDPSET - sets IMS Pdp APN Name

This command sets IMS Pdp APN Name. This name should be one of the APN names set in **+CGDCONT** command and appropriated context will be opened for IMS.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#IMSPDPSET=<pdpApnName>

This command sets IMS Pdp APN Name.

This name should be one of the APN names set in **+CGDCONT** command and appropriated context will be opened for IMS.

Parameter:

Name	Type	Default	Description
<pdpApnName>	string	-	from 1 to 32 symbols ANSI fixed string.

Can be used with or without quotes.

AT#IMSPDPSET?

Read command reports existing IMS Pdp APN Name in format:

#IMSPDPSET: ims

Not Subject to NDA

3.2.2.82. AT#FWTDEVICESET - Set FWT device for enabling 911 calling

Set FWT device for enabling 911 calling.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#FWTDEVICESET=<mode>

This command is used to set FWT(Fixed Wireless Terminal) device for enabling 911 calling.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable or disable FWT deivces for enabling 911 calling.

Values:

0 : Disable 911 calling on FWT devices

1 : Enable 911 calling on FWT devices

This command is for Verizon and the UE shall include following proprietary headers in the SIP INVITE:

P-Com.ServiceType: Static-Emergency

P-com.E911ServiceType: VZWFreedom

This command is only available when using "VZWFreedom" which is the specified service type of emergency call on the FWT device.

Even if this command is not set, there is no affect when using emergency calls or general voice calls.

Not Subject to NDA

FWT devices are defined as LTE capable devices that allow users to make voice calls by connecting external devices (example: a landline telephone).

AT#FWTDEVICESET?

Read command reports whether FWT device for enabling 911 calling is currently enabled or not, in the format:

#FWTDEVICESET: <mode>

AT#FWTDEVICESET=?

Test command returns the range of supported values for all the parameters.

AT#FWTDEVICESET=?
#FWTDEVICESET: (0-1)

OK

Not Subject to NDA

3.2.2.83. AT#WKIO - Set RING CFG Parameters

This command configures the service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#WKIO=[<Mode>[,<Pin>[,<Trigger>[,<Timer>]]]]

Set command configures the service.

Parameters:

Name	Type	Default	Description
<Mode>	integer	0	Enable\Disable for the feature. Values: 0 : Disable (default). 1 : Enable.
<Pin>	integer	0	Set the outputs line for wakeup detection Values: 0 : Ring Only (default, GPIO4 always in HIGH state) 1 : Ring & GPIO 4 2 : GPIO 4 3 : No Pins (GPIO4 always in HIGH state)
<Trigger>	integer	2	Line will be Wakeup By Values: 0 : SMS 1 : CALL

Not Subject to NDA

	2 : SMS Or CALL (default)		
<Timer>	integer	N/A	Set the time interval for the wakeup line to be at HIGH state range (1-60) Sec default 1 sec. Value: 1÷60 : sec

To received Pulse in the ring line you need to set **AT\R=2** and save profile (the ring wave shape will be Pulse only when call received).

To be able to wake up by SMS need to set the command **AT#E2SMSRI** at power up.

AT#WKIO?

Read command returns the current settings of parameters in the format:

#WKIO: <Mode>,<Pin>,<Trigger>,<Timer>

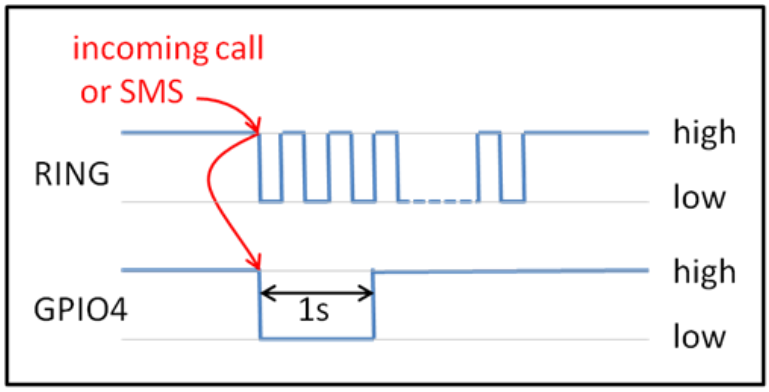
AT#WKIO=?

Test command returns the supported values for the RINGCFG parameters:

#WKIO: (0,1),(0-2),(0-3),(1-60)

Not Subject to NDA

AT#RINGCFG=1,1,2,1



Not Subject to NDA

3.2.2.84. AT#CDORM - Dormant control command

Dormant control command

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CDORM=<action>[,<call_id>]

Set command used to:

1. Enable/Disable the indication of dormant mode.
2. Fast dormancy
3. Exit from dormancy.

Parameters:

Name	Type	Default	Description
<action>	integer	0	mode for control
	Values:		
	0 : Disable the dormant status unsolicited result code		
	1 : Enable the dormant status unsolicited result code : Refer to Additional info		
	2 : Go to dormant(fast dormancy)		
	3 : Exit dormant for <call_id> or first found call id if no <call_id> mentioned.		
<call_id>	integer	N/A	call identification number.
	Value:		
	0÷17 : only for Exit dormancy action		

Additional info:

Not Subject to NDA

- When the indication is enabled, an unsolicited report with current status (dormant or active) per packet call will be sent to the DTE. Then, an update report sent to the DTE each time a change detected on status.

- Unsolicited result code for **<action>** 1:

  #CDORM:<call_id>,<dormant_status>

  Where: **<dormant_status>** -

  0 - call is in dormant mode

  1 - call is in active mode

AT#CDORM?

The read command returns the current settings and status.

#CDORM:<unsolicited_status>[,<call_id>,<dormant_status>][<CR><LF>
#CDORM:<unsolicited_status>[,<call_id>,<dormant_status>][...]]

Where: **<unsolicited_status>**

0 - call is in dormant mode

1 - call is in active mode

AT#CDORM=?

The test command returns the possible ranges of **<action>** and **<call_id>**

Not Subject to NDA

3.2.2.85. AT#CGMF - Request Product Code

Execution command returns the device product parameter code

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CGMF

The command returns the following message:

AT#CGMF
<product parameter version>

OK

AT#CGMF=?

Test command returns **OK** result code.

Not Subject to NDA

3.2.3. S Parameters

3.2.3.1. ATS0 - Number of Rings to Auto Answer

The command controls the automatic answering feature of the DCE.

ITU-T Recommendation V.25 ter
3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS0=[<n>]

Set command sets the number of rings required before device automatically answers an incoming call.

Parameter:

Name	Type	Default	Description
<n>	integer	0	Number of rings

Values:

0 : auto answer disabled

1÷255 : number of rings required before automatic answer. The DCE answers when the incoming call indication (ring) has occurred the number of times indicated by the value.

Data only products ignore command setting and auto answer is disabled if incoming call is a voice call.

Not Subject to NDA

ATS0?

Read command returns the current value of S0 parameter.

Not Subject to NDA

3.2.3.2. ATS1 - Ring Counter

S1 is incremented each time the device detects the ring signal of an incoming call. **S1** is cleared as soon as no ring occur.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS1

The form **ATS1** has no effect, returns **OK** result code.

ATS1?

Read command returns **S1** value.

Not Subject to NDA

3.2.3.3. ATS2 - Escape Character

The command manages the ASCII character used as escape character.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS2=<char>

Set command sets the ASCII character to be used as escape character.

Parameter:

Name	Type	Default	Description
<char>	integer	43	escape character decimal ASCII Value: 43 : factory default value is '+'

The escape sequence consists of three escape characters preceded and followed by **n** ms of idle (see **S12** to set **n**).

This command only supports 43 for **<char>** parameter.

ATS2?

Read command returns the current value of **S2** parameter.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.4. ATS3 - Command Line Termination Character

The command manages the character configured as command line terminator.

ITU-T Recommendation V.25 ter

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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:

Name	Type	Default	Description
<char>	integer	13	command line termination character (decimal ASCII)
	Value:		
	0÷127	:	command line termination character

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)

Not Subject to NDA

ATS3?

Read command returns the current value of **S3** parameter.

The format of the numbers in output is always 3 digits, left-filled with 0s

Not Subject to NDA

3.2.3.5. ATS4 - Response Formatting Character

The command manages the character generated by the device as part of the header, trailer, and terminator for result codes and information text.

ITU-T Recommendation V.25 ter

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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:

Name	Type	Default	Description
<char>	integer	10	response formatting character (decimal ASCII)
	Value:		
	0÷127	:	response formatting character

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.

Not Subject to NDA

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.6. ATS5 - Command Line Editing Character

The command manages the value of the character recognized by the DCE as a request to delete from the command line the immediately preceding character.

ITU-T Recommendation V.25 ter

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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:

Name	Type	Default	Description
<char>	integer	8	command line editing character (decimal ASCII) Value: 0÷127 : command line editing character

ATS5?

Read command returns the current value of **S5** parameter.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.7. ATS7 - Connection Completion Time-Out

This set command specifies the amount of time that the DCE shall allow between either answering a call (automatically or by the **ATA** command) or completion of signaling of call addressing information to network (dialing), and establishment of a connection with the remote DCE. If no connection is established during this time, the DCE disconnects from the line and returns a result code indicating the cause of the disconnection.

ITU-T Recommendation V.25 ter

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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 signaling of call addressing information to network (dialing), and establishment of a connection with the remote device.

Parameter:

Name	Type	Default	Description
<tout>	integer	0	defines time interval expressed in seconds
	Values:		
	0	:	disabled
	1÷255	:	available range

At LE910C1-AP (for JAPAN), a max value is 100.

Not Subject to NDA

ATS7?

Read command returns the current value of **S7** parameter.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.8. ATS8 - Comma Dial Modifier Time

This command sets comma dial modifier time.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS8=[<time>]

Set command sets the amount of time, in seconds, that the DCE shall pause, during signalling of call addressing information to the network (dialling), when a "P" dial modifier is encountered in a dial string.

Parameter:

Name	Type	Default	Description
<time>	integer	3	number of seconds

Values:

0 : DCE does not pause when "," encountered in dial string.

1÷255 : Number of seconds to pause.

ATS8?

Read command returns the current value of **S8 parameter**.

Not Subject to NDA

3.2.3.9. ATS10 - Carrier Off with Firm Time

The command is available only for backward compatibility

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS10=<n>

Set command has no effect and is available only for backward compatibility with landline modems.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	dummy
	Value:		
	1÷255 : dummy parameter		

Not Subject to NDA

3.2.3.10. ATS12 - Escape Prompt Delay

The command manages the prompt delay between two different escape characters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS12=<time>

Set command sets:

8. 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;
9. the maximum period allowed between receipt of first or second character of the three escape character sequence and receipt of the next;
10. 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:

Name	Type	Default	Description
<time>	integer	50	delay expressed in fiftieth of a second
	Value:		
	20÷150	:	expressed in fiftieth of a second (0.4 – 3 [s])

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.

If the Escape Sequence Guard Time set to a value different from zero, it overrides the one set with **S12**.

Not Subject to NDA

ATS12?

Read command returns the current value of **S12** parameter.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.11. ATS25 - Delay to DTR Off

The command manages the amount of time that the device will ignore the **DTR**.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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:

Name	Type	Default	Description
<time>	integer	5	expressed in hundredths of a second
	Value:		
	0÷255	:	expressed in hundredths of a second

The delay is effective only if its value is greater than 5. To be recognized as valid, the **DTR** transition must be greater than **S25**. Low values could require a transition increased of a factor 1.5 to be correctly handled (e.g., to be sure that **S25=5** works, use a **DTR** toggle of 75ms to be detected).

In power saving (e.g. **+CFUN=5** with **DTR** low) **DTR** must 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.

Not Subject to NDA

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.12. ATS30 - Disconnect Inactivity Timer

This command defines disconnect inactivity timer.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS30=<tout>

Set command defines the inactivity time-out in minutes. The device disconnects if no characters are exchanged for a time period of at least **<tout>** minutes.

Parameter:

Name	Type	Default	Description
<tout>	integer	0	expressed in minutes

Values:

0 : disabled, disconnection due to inactivity is disabled

1÷127 : inactivity time-out value

ATS30?

Read command returns the current value of **S30 parameter**.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

3.2.3.13. ATS38 - Delay To Before Forced Hang Up

This command sets delay to before forced hang up.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATS38=<dalay>

Set command sets the delay, in seconds, between the device's receipt of **H** command (or **ON**-to-**OFF** transition of **DTR**) and the disconnect operation.

Parameter:

Name	Type	Default	Description
<dalay>	integer	20	acknowledge timer in units of seconds

Values:

0÷254 : the device will wait <delay> seconds for the remote device to acknowledge all data in the device buffer before disconnecting

255 : the device doesn't time-out and continues to attempt to deliver data in the buffer until the connection is lost or the data is delivered

<delay> parameter can be used to ensure that data in device buffer is sent before device disconnects.

ATS38?

Read command returns the current value of **S38 parameter**.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Not Subject to NDA

Not Subject to NDA

3.2.3.14. AT&V1 - S Registers Display

The command displays the S registers values.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&V1

Execution command returns the S registers values in both decimal and hexadecimal format. The response is in the form:

REG (S register)	**DEC** (value in dec. notation)	**HEX** (value in hex notation)
<reg0>	**<dec>**	**<hex>**
<reg1>	**<dec>**	**<hex>**
...	**...**	**...**
<regN>	**<dec>**	**<hex>**

Not Subject to NDA

Here is a generic example showing the format.

```
AT&V1

REG  DEC  HEX
000  000  000
001  000  000
002  043  02B
003  013  00D
004  010  00A
005  008  008
007  060  03C
012  050  032
...  ...  ...
...  ...  ...

OK
```


Not Subject to NDA

3.2.3.15. AT&V3 - Extended S Registers Display

The command displays the extended S registers values.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&V3

Execution command returns the extended S registers values in both decimal and hexadecimal format. The response is in the form as shown in **AT&V1** command.

Here is a generic example showing the format.

```
AT&V3

REG  DEC  HEX
000  000  000
001  000  000
002  043  02B
003  013  00D
004  010  00A
005  008  008
007  060  03C
012  050  032
025  005  005
...  ...  ...
...  ...  ...

OK
```


Not Subject to NDA

3.2.4. DTE - Modem Interface Control

3.2.4.1. ATE - Command Echo

This command allows to enable or disable the command echo.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATE[<n>]

The execution command allows to enable/disable the command echo.

Parameter:

Name	Type	Default	Description
<n>	integer	1	Configuration value

Values:

0 : disables command echo

1 : enables command echo, hence command sent to the device are echoed back to the DTE before the response is given.

If parameter is omitted, the command has the same behavior of **ATE0**

Not Subject to NDA

3.2.4.2. ATQ - Quiet Result Codes

This command allows to enable or disable the result code.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATQ[<n>]

Set command enables or disables the result codes.

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables result codes

Values:

0 : enables result codes

1 : disables result codes. The commands entered after ATQ1 do not return the result code.

2 : disables result codes (only for backward compatibility). The commands entered after ATQ2 do not return the result code.

If parameter is omitted, the command has the same behavior of **ATQ0**.

Not Subject to NDA

After issuing **ATQ0** the **OK** result code is returned

```
AT+CGACT=?
+CGACT: (0-1)
OK
```

After issuing **ATQ1** or **ATQ2** the **OK** result code is not returned.

```
AT+CGACT=?
+CGACT: (0-1)
```


Not Subject to NDA

3.2.4.3. ATV - Response Format

This command allows to set format of information responses and result codes.

[1] ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

ATV[<n>]

Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (according to [1]).

Parameter:

Name	Type	Default	Description
<n>	integer	1	format of information responses and result codes. See Additional info section.

Values:

0 : limited headers and trailers and numeric format of result codes

1 : full headers and trailers and verbose format of result codes

Additional info:

<n>=0	
information responses	<text><CR><LF>
result codes	<numericCode><CR>

Not Subject to NDA

<n>=1	
information responses	<CR><LF> <text><CR><LF>
result codes	<CR><LF> <verboseCode><CR><LF>

- the **<text>** portion of information responses is not affected by this setting.
- if parameter is omitted, the command has the same behavior of **ATV0**

Not Subject to NDA

3.2.4.4. ATI - Identification Information

This command returns identification information.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

ATI[<n>]

Execution command returns product information.

Parameter:

Name	Type	Default	Description
<n>	integer	0	information request
	Values:		
	0 : numerical identifier		
	1 : module checksum		
	2 : checksum check result		
	3 : manufacturer		
	4 : product name		
	5 : DOB version		

If parameter is omitted, the command has the same behavior of **ATI0**

Not Subject to NDA

3.2.4.5. AT&C - Data Carrier Detect (DCD) Control

This command controls the DCD output behavior.

ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&C[<n>]

Set command controls the DCD output behavior of the serial port.

Parameter:

Name	Type	Default	Description
<n>	integer	1	DCD output behavior

Values:

0 : DCD remains always High

1 : DCD follows the Carrier detect status: if carrier is detected DCD goes High, otherwise DCD is Low

2 : DCD is always High except for 1 sec "wink" when a data call is disconnected

If parameter is omitted, the command has the same behavior of **AT&C0**.

Not Subject to NDA

3.2.4.6. AT&D - Data Terminal Ready (DTR) Control

This set command configures the behavior of the module according to the DTR control line transitions.

ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT&D[<n>]

Set command configures the module behavior relative to the DTR signal transitions.

Parameter:

Name	Type	Default	Description
<n>	integer	0	defines the module behavior according to the DTR control line transitions

Values:

0 : DTR transitions are ignored by the module

1 : When the MODULE is connected, the High to Low transition of DTR pin sets the device in command mode and the current connection is NOT closed.

2 : When the MODULE is connected, the High to Low transition of DTR pin sets the device in command mode and the current connection is closed.

3 : C108/1 operation enabled

4 : C108/1 operation disabled

Not Subject to NDA

- if a connection has been set up issuing either **#SKTD** or **#SKTOP**, then **AT&D1** has the same effect as **AT&D2**.
- If **AT&D2** been issued and the **DTR** has been tied **Low**, auto answering is inhibited and it is possible to answer only issuing command **ATA**.
- If parameter is omitted, the command has the same behavior of **AT&D0**.
- **&D3**, **&D4** are used for the backward compatibility, the command has the same behaviour of **AT&D0**.

Not Subject to NDA

3.2.4.7. AT\Q - Standard Flow Control

This command controls the RS232 flow control behavior.

ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT\Q[<n>]

Set command controls the RS232 flow control behavior.

Parameter:

Name	Type	Default	Description
<n>	integer	3	RS232 flow control behavior

Values:

0 : no flow control

2 : hardware mono-directional flow control (only CTS active)

3 : hardware bi-directional flow control (both RTS/CTS active)

If parameter is omitted, the command has the same behaviour as **AT\Q0**.

Hardware flow control (**AT\Q3**) is not active in command mode. To active this setting in command mode, use AT#CLFO=1.

AT\Q's settings are functionally a subset of **AT&K**'s ones.

Not Subject to NDA

3.2.4.8. AT&K - Flow Control

Flow Control settings.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT&K[<n>]

Set command controls the RS232 flow control behavior.

Parameter:

Name	Type	Default	Description
<n>	integer	3	flow control behavior

Values:

0 : no flow control

3 : hardware bi-directional flow control (both RTS/CTS active)

If parameter is omitted, the command has the same behavior as **AT&K0**.

AT&K has no Read Command. To verify the current setting of **AT&K**, simply check the settings of the active profile issuing **AT&V**.

Hardware flow control (**AT&K3**) is not active in command mode. To active this setting in command mode, use **AT#CFLO=1**.

&K has no Read Command. To verify the current setting of **&K**, simply check the settings of the active profile issuing **AT&V**.

Not Subject to NDA

3.2.4.9. AT&S - Data Set Ready (DSR) Control

Set DSR behavior on RS232

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT&S[<n>]

Set command controls the RS232 **DSR** pin behavior.

Parameter:

Name	Type	Default	Description
<n>	integer	3	Configuration parameter

Values:

0 : Always High

1 : Follows carrier status

2 : High when DATA mode connected

3 : High when the modem device is ready to receive AT command

If option 1 selected, then **DSR** tied **High** when the device receives from the network the UMTS traffic channel indication.

In power saving mode the **DSR** pin always tied **Low** & USB_VBUS pin always tied Low.

If parameter is omitted, the command has the same behavior of **AT&S0**.

If option 1 or 2 active, **DSR** will not tie **High** in case of GSM voice connection.

Not Subject to NDA

Not Subject to NDA

3.2.4.10. AT+IPR - UART DCE Interface Data Rate Speed

The command sets the speed of the DTE serial port.

[1] Hardware User's Guide of the used module

[2] ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+IPR=<rate>,<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.

Parameters:

Name	Type	Default	Description
<rate>	integer	115200	speed of the first UART serial port expressed in bit per second

Values:

300 : bps

600 : bps

1200 : bps

2400 : bps

4800 : bps

9600 : bps

19200 : bps

38400 : bps

Not Subject to NDA

57600 : bps

115200 : bps

230400 : bps

460800 : bps

921600 : bps

2000000 : bps

2500000 : bps

3000000 : bps

3500000 : bps

3750000 : bps

<rate>	integer	115200	speed of the second UART serial port expressed in bit per second

Values:

300 : bps

600 : bps

1200 : bps

2400 : bps

4800 : bps

9600 : bps

19200 : bps

38400 : bps

57600 : bps

115200 : bps

230400 : bps

Not Subject to NDA

460800 : bps

921600 : bps

If **<rate>** specified **DTE-DCE** speed fixed to that speed, hence no speed auto-detection (autobauding) enabled.

AT+IPR?

Read command returns the current value of **<rate>** parameter.

AT+IPR?

+IPR: 115200,115200

OK

AT+IPR=?

Test command returns the list of supported auto detectable **<rate>** values and the list of fixed-only **<rate>** values in the format:

+IPR:(list of supported auto detectable **<rate>** values), (list of fixed-only **<rate>** values)

AT+IPR=?

+IPR: (300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,2000000,2500000,3000000,3500000,3750000),(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600)

OK

Not Subject to NDA

This command has no effect on **USB** interface; the DCE sends the **OK** result but the settings has no effect on serial interface

Not Subject to NDA

3.2.4.11. AT#DTR - Data Terminal Ready (DTR) flow control

The command configures how the outbound flow on serial ports is controlled by the DTR signal.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#DTR=<n>

This set command configures the behavior of th outbound flow according to the DTR control line level transitions.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	DTR outbound flow control behavior

Values:

0 : DTR level transitions are ignored and cannot control the outbound data flow

1 : DTR level transitions control the outbound data flow. If DTR is asserted, the output data is sent; if DTR is not asserted, the output data is blocked

Additional info:

- For USIF ports default value of **<n>** is 0.
- For USB ports default value of **<n>** is 2.
- The range depends on the port.

Not Subject to NDA

For USB ports, receiving input data has the same effect of a low to high level transition. Therefore, if the DTR is not asserted, or if it is asserted but its level has not been signaled by the DTE to the DCE, after receiving input data the DTR is considered asserted. A new DTR level transition from asserted to not asserted will block again the outbound flow.

USIF ports without DTR pin only support **<n>**=0.

This command is available when #M2MATP is '1'.

AT#DTR?

Read command returns the current of **<n>** parameter.

AT#DTR=?

Test command returns the list of **<n>** values in the format:

#DTR: (list of <n> values)

For USB port:

AT#DTR=?

#DTR: (1,2)

OK

Not Subject to NDA

3.2.4.12. AT+FLO - Select Flow Control Specified By Type

Set command selects the flow control behaviour of the serial port in both directions: from DTE to DTA and from DTA to DTE.

ITU T.31 and TIA/EIA-578-A specifications

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+FLO=<type>

Set command selects the flow control behaviour of the serial port in both directions: from DTE to DTA and from DTA to DTE.

Parameter:

Name	Type	Default	Description
<type>	integer	2	flow control option for the data on the serial port Values: 0 : flow control None 2 : flow control Hardware (CTS-RTS)

This command is a shortcut of the **+IFC** command.

+FLO's settings are functionally a subset of **&K**'s ones.

AT+FLO?

Read command returns the current value of parameter **<type>.**

Not Subject to NDA

AT+FLO=?

Test command returns all supported values of the parameter **<type>.**

Test command result is without command echo.

Not Subject to NDA

3.2.4.13. AT+IFC - DTE-Modem Local Flow Control

This set command selects the flow control of the serial port in both directions.

ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+IFC=<byDTE>,<byDCE>

Set command selects the flow control behavior of the serial port in both directions: from DTE to modem (<byDTE> option) and from modem to DTE (<byDCE>)

Parameters:

Name	Type	Default	Description
<byDTE>	integer	2	specifies the method used by the DTE to control the flow of data received from the device (DCE) Values: 0 : no flow control 2 : flow control by RTS control line (C105, Request to Send)
<byDCE>	integer	2	specifies the method used by the device (DCE) to control the flow of data received from the DTE Values: 0 : no flow control

Not Subject to NDA

2 : flow control by CTS control line (C105, Clear to Send)

- The only possible commands are **AT+IFC=0,0** and **AT+IFC=2,2**.
- Hardware flow control (**AT+IFC=2,2**) is not active in command mode. To active this setting in command mode, use **AT#CFLO=1**.
- This command is equivalent to **&K** command.

AT+IFC?

Read command returns active flow control settings.

AT+IFC=?

Test command returns all supported values of the parameters **<byDTE>** and **<byDCE>**.

This command has no effect on USB interface. It's only for UART interface.

Not Subject to NDA

3.2.4.14. AT+ICF - DTE-Modem Character Framing

This set command defines the asynchronous character framing.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+ICF=<format>[,<parity>]

Set command defines the asynchronous character framing to be used when autobauding is disabled.

Parameters:

Name	Type	Default	Description
<format>	string	3	sets the number of Data bits and Stop bits. Only the **<format>=3** is supported. Value: 3 : 8 Data, 1 Stop
<parity>	string	0	This parameter is used for the backward compatibility. It's no meaningful. Values: 0 : odd 1 : even

AT+ICF?

Read command returns current settings for parameters <**format**> and <**parity**>.

Not Subject to NDA

AT+ICF=?

Test command returns the ranges of values for the parameters <**format**> and <**parity**>.

This command has no effect on USB interface. It's used only for UART interface.

```
AT+ICF=3
OK

AT+ICF=?
+ICF: (3),(0,1)

OK
```


Not Subject to NDA

3.2.4.15. AT#CFLO - Command Flow Control

This set command enables/disables the hardware flow control in command mode. If enabled, the flow control is applied to both data mode and command mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#CFLO=<enable>

Set command enables/disables the flow control in command mode. If enabled, the current flow control configured by **+IFC, &K,\Q** is applied to both data mode and command mode.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enable/disable hardware flow control
	Values:		
	0 : disable flow control in command mode		
	1 : enable flow control in command mode		

Setting value is saved in the profile.

This behaviour is valid only for Main UART port.

In case of USB port, flow control always enabled independent of this setting.

AT#CFLO?

Read command returns current setting value in the format:

Not Subject to NDA

#CFLO: <enable>

AT#CFLO=?

Test command returns the range of supported values for parameter <enable>.

Not Subject to NDA

3.2.4.16. AT#SKIPESC - Skip Escape Sequence

This command enables/disables skipping the escape sequence.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT#SKIPESC=[<mode>]

Set command enables/disables skipping the escape sequence (+++) while transmitting during a data connection.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable skipping the escape sequence (+++)

Values:

0 : does not skip the escape sequence; its transmission is enabled.

1 : skips the escape sequence; its transmission is not enabled.

In FTP connection the escape sequence is not transmitted, regardless of the command setting.

AT#SKIPESC?

Read command returns the current value of the parameter <mode> in the format:

#SKIPESC: <mode>

Not Subject to NDA

AT#SKIPESC=?

Test command returns the supported values of parameter <**mode**>.

Not Subject to NDA

3.2.4.17. AT#E2ESC - Escape Sequence Guard Time

This 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.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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:

Name	Type	Default	Description
<gt>	integer	0	sets a guard time in seconds
	Values:		
	0 :		no guard time
	1÷3 :		guard time in seconds.

If the Escape Sequence Guard Time set to a value different from zero, it overrides the one set with **S12**.

AT#E2ESC?

Read command returns current value of the escape sequence guard time, in the format:

#E2ESC: <gt>

Not Subject to NDA

AT#E2ESC=?

Test command returns the **OK** result code.

Not Subject to NDA

3.2.4.18. ATX - Extended Result Codes

This command allows to select the subset of result code messages.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

ATX[<n>]

Set command selects the subset of result code messages the modem uses to reply to the DTE upon AT commands execution.

Parameter:

Name	Type	Default	Description
<n>	integer	1	configuration value

Values:

0 : when entering in dial mode a CONNECT result code is relayed; see Additional info.

1÷4 : when entering in dial mode a CONNECT <text> result code is relayed, see Additional info.

Additional info:

<n>=0
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.

<n>=1÷4
all the remaining result codes are enabled.

Not Subject to NDA

When the <n> parameter is omitted, the command acts like **ATX0**.

Current value is returned by **AT&V**.

Parameter:

<n>

0 - EXTENDED MESSAGES : X0=NO

1..4 - EXTENDED MESSAGES : X1=YES

For complete control on **CONNECT** response message see also **+DR** command.

Not Subject to NDA

3.2.4.19. AT#KIPR - Keep DTE Interface Rate

This command enables/disables to keep the current **DTE** speed permanently.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#KIPR=<enable>

Set command enables/disables to keep the current **DTE** speed permanently. If enabled, the current **DTE** speed configured by **+IPR** won't be changed back to default value specified by manufacturer even if **&F** or base section value of the specified by user profile even if **Z**.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enables/disables to keep the current **DTE** speed permanently Values: 0 : disable 1 : enable to keep the current DTE speed

Setting value is saved in the NVM.

This behavior is valid only for UART port.

AT#KIPR?

Read command returns the current value of **#KIPR** parameter.

AT#KIPR?

Not Subject to NDA

#KIPR: 1

OK

AT#KIPR=?

Test command returns the list of supported **<enable>** values in the format:

AT#KIPR=?

#KIPR: (0,1)

OK

AT+IPR=115200,9600

OK

AT+IPR?

+IPR: 115200,9600

OK

AT&W&P

OK

AT#KIPR=1

OK

AT&F

OK

AT+IPR?

+IPR: 115200,9600

OK

Not Subject to NDA

3.2.4.20. AT#NOPT - Notification Port

Set notification(URC) message port

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#NOPT=<num>

Set command specifies the port output notification (URC) messages

Parameter:

Name	Type	Default	Description
<num>	integer	0	Notification(URC) port

Values:

0 : All Ports; URC messages are sent to all ports

1 : UART 1 Port

2 : Telit USB Modem 1 Port

3 : Telit USB Modem 2 Port

4 : UART 2 Port

5 : Multiplexer DLCI1 Port

6 : Multiplexer DLCI2 Port

7 : Multiplexer DLCI3 Port

8 : Multiplexer DLCI4 Port

URC messages sent out only on the configured ports by this command.

Not Subject to NDA

If the configured port closed, URC messages will be discarded.

DTE must enable DTR line to get URC messages on Telit USB ports and Multiplexer ports.

AT#NOPT?

Read command reports the current notification port.

AT#NOPT=?

Test command reports the available range of values for parameter **<num>.**

Not Subject to NDA

3.2.4.21. AT#NOPTEXT - Notification Port Extension

Set notification port extension

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#NOPTEXT=<noptext_enable>[,<port1_enable>[,<port2_enable>[,<port3_enable>[,<port4_enable>[,<port5_enable>[,<port6_enable>[,<port7_enable>[,<port8_enable>]]]]]]]]

Set command specified the port output notification (URC) messages

This command is extended from AT#NOPT command.

Unlike AT#NOPT, this command allow to specify a number of URC ports URC message print out

Parameters:

Name	Type	Default	Description
<noptext_enable>	integer	0	enable #NOPTEXT Values: 0 : Disable #NOPTEXT command set 1 : Enable #NOPTEXT command set
<port1_enable>	integer	N/A	enable port1 - UART 1 Port Values: 0 : disable URC message on port1 1 : enable URC message on port1
<port2_enable>	integer	N/A	enable port2 - Telit USB Modem 1 Port Values:

Not Subject to NDA

			0 : disable URC message on port2 1 : enable URC message on port2
<port3_enable>	integer	N/A	enable port3 - Telit USB Modem 2 Port Values: 0 : disable URC message on port3 1 : enable URC message on port3
<port4_enable>	integer	N/A	enable port4 - UART 2 Port Values: 0 : disable URC message on port4 1 : enable URC message on port4
<port5_enable>	integer	N/A	enable port5 - Multiplexer DLCI1 Port Values: 0 : disable URC message on port5 1 : enable URC message on port5
<port6_enable>	integer	N/A	enable port5 - Multiplexer DLCI2 Port Values: 0 : disable URC message on port6 1 : enable URC message on port6
<port7_enable>	integer	N/A	enable port5 - Multiplexer DLCI3 Port Values: 0 : disable URC message on port7

Not Subject to NDA

			1 : enable URC message on port7
<port8_enable>	integer	N/A	enable port5 - Multiplexer DLCI4 Port Values: 0 : disable URC message on port8 1 : enable URC message on port8

if <noptext_enable> is enable, #NOPT's setting value ignored and URC message port specified by #NOPTEXT setting value.

AT#NOPTEXT?

Read command show current <mode> on all notification(URC) port in the following format

#NOPTEXT: <noptext_enable>,<port1_enable>,<port2_enable>,<port3_enable>,...

AT#NOPTEXT=?

Test command returns the list of supported values in the following format

#NOPTEXT: (0,1),(<port1_descr>,(0,1)),(<port2_descr>,(0,1)),...

<port_descr>:

1. "UART_1" - UART 1 Port
2. "USB_MDM1" - Telit USB Modem 1 Port
3. "USB_MDM2" - Telit USB Modem 2 Port
4. "UART_2" - UART 2 Port
5. "CMUX_1" - Multiplexer DLCI1 Port
6. "CMUX_2" - Multiplexer DLCI2 Port
7. "CMUX_3" - Multiplexer DLCI3 Port
8. "CMUX_4" - Multiplexer DLCI4 Port

Not Subject to NDA

DTE must enable DTR line to get URC messages on Telit USB ports, otherwise URC message will be discarded

This command enable URC message on "UART_1" and "USB_MDM1"

- AT#NOPTEXT=1,1,0,0,0,0,0,0,0
  OK

Not Subject to NDA

3.2.4.22. AT+ILRR - DTE-Modem Local Rate Reporting

This command controls whether or not the **+ILRR: <rate>** information text transmitted from the **modem** (module) to the **DTE**.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	Yes	-	2

AT+ILRR=<n>

Set command controls whether or not the **+ILRR: <rate>** information text transmitted from the **modem** (module) to the **DTE**.

Parameter:

Name	Type	Default	Description
<n>	integer	0	local port speed rate reporting Values: 0 : local port speed rate reporting disabled 1 : local port speed rate reporting enabled

This information if enabled sent upon connection.

AT+ILRR?

Read command returns active setting of **<n>**.

AT+ILRR=?

Not Subject to NDA

Test command returns all supported values of the parameter **<n>**.

Not Subject to NDA

3.2.4.23. AT\K - Break Handling

This command is used to Break Handling .

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT\K

Execution command has no effect and is included only for backward compatibility with landline modems.

Not Subject to NDA

3.2.4.24. AT\R - Ring (RI) Control

This command allows the user to control the **RING** output pin behaviour.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT\R[<n>]

Set command controls the **RING** output pin behaviour.

Parameter:

Name	Type	Default	Description
<n>	integer	1	**RING** pin behaviour

Values:

0 : RING on during ringing and further connection

1 : RING on during ringing

2 : RING follows the ring signal

If the parameter is omitted, the command has the same behaviour of **AT\R0.**

To check the ring option status use the **&V** command.

Not Subject to NDA

3.2.4.25. AT\B - Transmit Break To Remote

This command controls transmit break to remote.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT\B

Execution command has no effect and is included only for backward compatibility with landline modems

Not Subject to NDA

3.2.4.26. AT\N - Operating Mode

This command controls operating mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT\N

Execution command has no effect and is included only for backward compatibility with landline modems

Not Subject to NDA

3.2.5. Call (Voice and Data) Control

3.2.5.1. ATD - Dialup Connection

This command establishes a Mobile Originated call to the destination phone number.

ITU-T Recommendation V.25 ter

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

ATD

The **ATD** execution command can assume different formats, which are described in the following Additional info section.

Additional info:

ATD<number>[;]

If ";" character is present, a voice call is performed using the phone number given as parameter.

Name	Type	Default	Description
<number>	string	-	phone number to be dialed Accepted characters are 0-9 and *,#,"A", "B", "C", "+". For backwards compatibility with landline modems, modifiers "R", ",", "W", "!", "@" are accepted, but have no effect. "P" will pause

Not Subject to NDA

	the dial string according to **ATS8** duration.

▶▶ **ATD><str>[;]**

If ";" character is present, a voice call is performed using the phone number identified by an alphanumeric field. All available memories are scanned to find out the field.

Name	Type	Default	Description
<str>	string	-	is an alphanumeric field identifying the phone number. The characters must be enclosed in quotation marks. The parameter is case sensitive. Use **+CSCS** command to select the character set.

▶▶ **ATD><mem><n>[;]**

If ";" character is present, a voice call is performed using the phone number stored in the selected phonebook memory storage and in the selected entry location. Use **+CPBS=?** command to get all the available memories.

Name	Type	Default	Description
<mem>	string	N/A	identifies the phonebook memory storage

Values:

SM : SIM/UICC phonebook

FD : SIM/USIM fixed dialing phonebook

LD : SIM/UICC last dialing phonebook

MC : Missed calls list

RC : Received calls list

Not Subject to NDA

DC : MT dialled calls list

ME : MT phonebook

EN : SIM/USIM (or MT) emergency number (+CPBW is not be applicable for this storage)

ON : SIM (or MT) own numbers (MSI storage may be available through +CNUM also).

MB : Mailbox numbers stored on SIM, if this service is provided by the SIM (see #MBN)

<n>	integer	-	entry location. It must be in the range of the available locations in the used memory.

▶▶ ATD><n>[;]

If ";" character is present, a voice call is performed using a phone number on entry location **<n>** of the active phonebook memory storage (see **+CPBS**).

Name	Type	Default	Description
<n>	integer	-	entry location of the active phonebook

▶▶ ATDL

Issues a call to the last number dialed.

▶▶ ATDS=<nr>[;]

If ";" character is present, a voice call is performed using the number stored in the internal phonebook of the module. For internal phonebook position refer to **&N** and **&Z** commands.

Not Subject to NDA

Name	Type	Default	Description
<nr>	integer	-	identifies the internal phonebook position of the module where is stored the phone number to be dialed

▶▶ ATD<number><modifier>[;]

If ";" character is present, a voice call is performed overriding the CLIR supplementary service subscription default value, or checking the CUG supplementary service information for the current call according to the modifier.

Name	Type	Default	Description
<number>	integer	-	phone number to be dialed
<modifier>	string	N/A	causes the call overrides the CLIR supplementary service subscription default value, or checks the CUG supplementary service information

Values:

I : invocation, restrict CLI presentation

i : suppression, allow CLI presentation

G : refer to +CCUG command

g : refer to +CCUG command

▶▶ ATD*<gprs_sc>[*<addr>][*[<L2P>][*[<cid>]]]]#

This command is specific for GPRS functionality, and causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN.

Not Subject to NDA

Name	Type	Default	Description
<gprs_sc>	integer	N/A	is the GPRS Service Code, which identifies a request to use the GPRS communication Value: 99 : GPRS Service Code
<addr>	string	-	identifies the called party in the address space applicable to the PDP.
<L2P>	string	-	indicates the layer 2 protocol to be used (see **+CGDATA**). For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used: 1 is equivalent to PPP.
<cid>	integer	-	PDP context definition, see **+CGDCONT** command

Not Subject to NDA

- Dial the phone number stored in the SIM phonebook at entry 6. The call is a data or voice call according to the mode set by **+FCLASS** command.

  ATD>SM6
  OK

- Dial the phone number stored in the active phonebook at entry 6. The ";" character is used, therefore the call is a voice call.

  ATD>6;
  OK

- Dial the phone number corresponding to the alphanumeric field "Name". The alphanumeric field is searched in all available memories. The ";" character is used, therefore the call is a voice call.

  ATD>"Name";
  OK

Not Subject to NDA

3.2.5.2. ATP - Pulse Dial

This command has no effect is included only for backward compatibility.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

ATP

Set command has no effect is included only for backward compatibility with landline modems.

Not Subject to NDA

3.2.5.3. ATO - Return to ON-Line Mode

This execution command is used, during a suspended data conversation, to return in on-line mode from command mode. If there is no suspended conversation, it returns **NO CARRIER**.

ITU-T Recommendation V. 25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

ATO

After issuing **ATO** command, the device returns in on-line mode. To enter again command-mode you must issue the escape sequence, see register **S2**.

Not Subject to NDA

3.2.5.4. ATT - Tone Dial

This command has no effect is included only for backward compatibility.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

ATT

Set command has no effect is included only for backward compatibility with landline modems.

Not Subject to NDA

3.2.5.5. AT&G - Guard Tone

This command tells the modem which guard tone, if any, to transmit while transmitting in the answer mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&G

Set command has no effect is included only for backward compatibility with landline modems.

Not Subject to NDA

3.2.5.6. AT&Q - Sync/Async Mode

This command selects the communication mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT&Q

Set command has no effect is included only for backward compatibility with landline modems.

Not Subject to NDA

3.2.5.7. AT+CHSN - HSCSD non-transparent call configuration

Set command controls parameters for originating non-transparent HSCSD calls.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CHSN=[<wAiur>[,<wRx>[,<topRx>[,<codings>]]]]

Set command controls parameters for originating non-transparent HSCSD calls. Values may also be used during mobile terminated data call setup. In GERAN, changing **<topRx>** or **<codings>** value during a call does not affect the current call. In GERAN, changing of **<wAiur>** or **<wRx>** affects the current call only if **<topRx>** was non-zero when call was established.

Parameters:

Name	Type	Default	Description
<wAiur>	integer	0	wanted air interface user rate. Values: 0 : 0 indicates that TA shall calculate a proper value from currently selected fixed network user rate. 1 : 9600 bps 2 : 14400 bps 4 : 28800 bps 7 : 57600 bps
<wRx>	integer	0	wanted amount of receive timeslots. Value: 0 : 0 indicates that TA shall calculate a proper value from currently selected <wAiur> and <codings>. This parameter is not applicable to UTRAN or EUTRAN UEs.

Not Subject to NDA

<topRx>	integer	0	top value for <wRx> that user is going to request during the next established nontransparent HSCSD call Value: 0 : 0 indicates that user is not going to change <wAiur>/<wRx> during the next call. This parameter is not applicable to UTRAN or E-UTRAN UEs.
<codings>	integer	0	a sum of integers each representing a channel coding that is accepted for non-transparent HSCSD calls. Value: 0 : 0 indicates that all supported codings are accepted (refer +CHSD command for other values). This parameter is not applicable to UTRAN or E-UTRAN UEs.

AT+CHSN?

+CHSN: <wAiur>,<wRx>,<topRx>,<codings>

AT+CHSN=?

+CHSN: (list of supported <wAiur>s), (list of supported <wRx>s),(list of supported <topRx>,(list of supported <codings>s)

Not Subject to NDA

3.2.5.8. ATA - Answer Incoming call

The command is used to answer to an incoming call if automatic answer is disabled.

ITU-T Recommendation V.25 ter
3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

ATA

Execution command informs the DCE that answer sequence must be started if automatic answer is disabled.

This command must be the last in the command line and must be followed immediately by a <CR> character.

Data only products do not start the call and command answer is ERROR if a voice call is requested.

Not Subject to NDA

3.2.5.9. ATH - Hang Up/Disconnect the Current Call

This execution command hangs up/disconnects the current voice/data call or dial-up.

ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

ATH

When a data call or a dial-up is active the device is in on-line mode hence, to execute **ATH** command the device must be previously turned in command mode using the escape sequence or, if **&D1** option is active, tying Low the DTR pin.

Not Subject to NDA

3.2.5.10. AT#DIALMODE - Set Dialing Mode

This command sets dialing modality.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#DIALMODE=[<mode>]

Set command sets dialing modality.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	sets dialing modality

Values:

0 : voice call only, see Additional info

1 : voice call only, see Additional info

2 : voice call and data call, see Additional info

Additional info:

- **<mode>**=0

  Voice call only, **OK** result code is received as soon as it starts remotely ringing.

- **<mode>**=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.

Not Subject to NDA

▶▶ <mode>=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.

In case a BUSY tone is received and at the same time **ATX0** is enabled **ATD** will return **NO CARRIER** instead of **DISCONNECTED**.

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 supported range of values for parameter <mode>.

Not Subject to NDA

3.2.5.11. AT#CALLDISA - Call Disable Setting

This command used to control the Disable Call Type and SMS only registration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CALLDISA=<disable_type>[,<sms_only>]

Set command sets the Disable Call Type and SMS only registration

Parameters:

Name	Type	Default	Description
<disable_type>	integer	0	Disable Type. It is used to enable/disable the Voice Call function Values: 0 : Enable Voice Call 1 : Disable Voice Call 2 : Disable Voice Call (same as 1)
<sms_only>	integer	0	SMS only. It is used to on/off the SMS only parameter. Values: 0 : None 1 : SMS only registration

Settings are affected after rebooting

If 1st parameter is set, the outgoing calls are not possible and the incoming calls are rejected on the modem.

Not Subject to NDA

If 2nd parameter is set to 1 when attempting the Attach request, then the Network doesn't send the paging for Voice Call and send the paging for only SMS.

It may vary depending on the operator or environment. Occasionally, some network send the paging both even if sms_only is set to 1.

If AT#CALLDISA=1,1 (Voice disable/ SMS only registration) is executed, IMS PDN bring-up and registration will be blocked.

AT#CALLDISA?

Read command returns the values of parameters in the format:

#CALLDISA: <disable_type>,<sms_only>

AT#CALLDISA=?

Test command reports supported range of values for all parameters.

Not Subject to NDA

3.2.6. Modulation & Compression Control

3.2.6.1. AT%E - Line Quality and Auto Retrain

This command is used for line quality monitoring and auto retrain or fall back/fall forward.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT%E[<n>]

Execution command has no effect and is included only for backward compatibility with landline modems.

Parameter:

Name	Type	Default	Description
<n>	integer	-	this parameter is not really used, and it is present only for backward compatibility

If <n> parameter is not specified, the default value is considered

Not Subject to NDA

3.2.6.2. AT+DS - Data Compression

The command sets the V42 compression parameter.

ITU-T V.25ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+DS=[<dir>[,<neg>[,<P1>[,<P2>]]]]

Set command sets the V42 compression parameter.

Parameters:

Name	Type	Default	Description
<dir>	integer	3	desired direction of operations Values: 0 : no compression 1 : transmit only 2 : receive only 3 : both directions, accept any direction
<neg>	integer	0	whether the DCE should continue to operate if the desired result is not obtained Value: 0 : Do not disconnect if V.42 bis is not negotiated by the remote DCE as specified in <direction>
<P1>	integer	2048	maximum number of dictionary entries Value:

Not Subject to NDA

	512÷2048 : supported value		
<P2>	integer	6	the maximum string length
	Value:		
	6 : the only supported value		

AT+DS?

Read command returns current value of the data compression parameter.

AT+DS=?

Test command returns all supported values of the parameter.

Not Subject to NDA

3.2.6.3. AT+DR - Data Compression Reporting

This command enables the data compression reporting.

ITU-T V.25ter

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+DR=<n>

Set command enables/disables the data compression reporting upon connection.

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables the data compression reporting upon connection Values: 0 : disable 1 : enable

Additional info:

- If enabled, the following intermediate result code is transmitted before the final result code:

  +DR: <compression>

AT+DR?

Not Subject to NDA

Read command returns the current value of the parameter <n> in the format:

+DR: <n>

AT+DR=?

Test command returns the supported values of parameter <n>.

Not Subject to NDA

3.3. Jamming Detection and Report

3.3.1. AT#JDRENH2 - Enhanced Jamming Detection and Report

This command enables/disable jamming detection and reports the relative result to the user.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#JDRENH2=<mode>[,<sat2G>,<unused>,<carrNum2G>,<pRxLevT2G>,<unused>,<unused>,<unused>[,<P_RSSI_T4G>[,<P_RSRQ_T4G>[,<unused>[,<urcDump>]]]]]

The set command performs the following activities:

- enables/disables the detection of the presence of jamming in the module coverage.

- selects one of the following two reports mode or both: on dedicated GPIO, by means of the URC, or GPIO + URC

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enable/disable jamming detection and select reporting mode Values: 0 : disable jamming detection

Not Subject to NDA

1 : enable jamming detection, and report its condition on a GPIO pin, see Additional info section

2 : enable jamming detection, and report its condition with an URC, see Additional info section

3 : enable jamming detection, and report its condition as <mode>=1 and <mode>=2

4 : enable jamming detection, and report its condition with an URC every 3 sec, see <mode>=2

5 : enable jamming detection, and report its condition as <mode>=1 and <mode>=4

6 : not used

<sat2G>	integer	45	is the starting absolute threshold of RSSI 2G network. After a frequency scan in 2G bands, if the measured power of a carrier is greater than **<sat2G>** threshold, that carrier is counted as possible jammed carrier.

Value:

0÷63 : threshold values

<unused>	integer	N/A	unused parameter

Value:

0 : dummy value

<carrNum2G>	integer	100	is the minimum number of possible jammed carriers to consider that the module is under jamming condition

Value:

Not Subject to NDA

	0÷200 : number of carriers		
<pRxLevT2G>	integer	15	set the threshold of RxLev in 2G Network. The RxLev_Thr threshold is calculated as shown below: RxLev_Thr = RxLev_Av * (1 + (<**pRxLevT2G**>/100)) where RxLev_Av is the average of the last 10 RxLev measures.
	Value: 0÷100 : values used to compute RxLev_Thr threshold		
<unused>	integer	N/A	unused parameter
	Value: 0 : dummy value		
<unused>	integer	N/A	unused parameter
	Value: 0 : dummy value		
<unused>	integer	N/A	unused parameter
	Value: 0 : dummy value		
<P_RSSI_T4G>	integer	20	Set the threshold of RSSI. The threshold (T_RSSI_MAX/T_RSSI_MIN) is calculated as: T_RSSI_MAX = RSSI_Avg*(1+(<**P_RSSI_T4G**>/100))

Not Subject to NDA

			T_RSSI_MIN = RSSI_Avg*(1-(<P_RSSI_T4G>/100)) where RSSI_Avg is the average of the last 50 RSSI measures.
	Value: 0÷100 : RSSI threshold values		
<P_RSRQ_T4G>	integer	20	Set the threshold of RSRQ. The threshold (RSRQ_Thr) is calculated as RSRQ_Thr = RSRQ_Avg*(1-(<P_RSRQ_T4G>/100)) where RSRQ_Avg is the average of the last 50 RSRQ measures.
	Value: 0÷100 : RSRQ threshold values		
<unused>	integer	0	unused parameter
	Value: 0 : dummy value		
<urcDump>	integer	0	enable/disable URC dump
	Values: 0 : disable URC dump 1 : enable URC dump and save the jamming condition in a file		

Additional info:

- <mode>=1

Not Subject to NDA

The jamming condition is reported on pin GPIO_02 (JDR):

- GPIO_02 (JDR) = Low, Normal Operating Condition
- GPIO_02 (JDR) = High, Jammed Condition

To have information on GPIO_02 pin, refer to document [1]. GPIO_02 pin can be used also by other functionality, see **#GPIO** command.

▶▶ <**mode**>=2

the jamming condition is reported with a single URC on serial line, in the format:

#JDR: <status>

▶▶ <**urcDump**>=1

the text of the URC reporting the jamming condition is saved in the file:

/data/az/jdrenh2.urc

The URC is dumped only if it has been enabled (<**mode**>=2 to 5)

Unsolicited field:

Name	Type	Description
<status>	string	jamming condition status, <**mode**>=2 Values: JAMMED RAT : jamming condition detected, <RAT> is the Radio Access Technology for operators: GSM or LTE. OPERATIVE RAT : Normal Operating condition restored. Status shown only after a jamming condition has occurred.

Not Subject to NDA

AT#JDRENH2?

Read command reports the current parameters values, in the format:

#JDRENH2:<mode>,<sat2G>,0,<carrNum2G>,<pRxLevT2G>,0,0,0,<P_RSSI_T4G>,<P_RSRQ_T4G>,0,0

AT#JDRENH2=?

Test command reports the supported range of values for the parameters.

Not Subject to NDA

3.3.2. AT#JDRGNSS - GNSS Jamming Detect & Report

This command configures to support GNSS Jamming Detect & Report.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#JDRGNSS=<mode>

Set command allows to control the GNSS Jamming Detect & Report feature.

The MODULE can detect if a GNSS Jammer is active in its range and give indication to the user of this condition on the serial line with an unsolicited code, in the format:

#JDRGNSS: <status>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	behavior mode of the Jammed Detect & Report Values: 0 : disables Jammed Detect & Report 1 : enables the Jammed Detect

Unsolicited field:

Name	Type	Description
<status>	string	Jammed condition Values: JAMMING SUSPICION : Suspicion of GNSS jamming

Not Subject to NDA

JAMMED	:	Jammed condition detected
OPERATIVE	:	Normal Operating condition restored

When the Jammed condition is changed, the Jammed <**status**> is reported.

AT#JDRGNSS?

Read command reports the current behavior mode and Jammed state, in the format:

#JDRGNSS: <mode>,<state>

Additional info:

where

Name	Type	Default	Description
<state>	integer	255	Jammed state

Values:

0 : Normal Operating condition restored

1 : Jammed condition detected

2 : Suspicion of GNSS jamming

255 : Unknown

AT#JDRGNSS=?

Not Subject to NDA

Test command reports the supported range of values for the parameters.

#JDRGNSS: (0,1)

Not Subject to NDA

3.3.3. AT#JDR4GCFG - LTE Jamming Detection Threshold Configuration

The command configures the LTE Jamming Detection thresholds.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#JDR4GCFG=<P_RSRP_T4G>,<P_RSRQ_T4G>,<P_RSSNR_T4G>

Set command allows to configure the LTE Jamming Detection thresholds. After configuration, use the **#JDRENH2** command to enable/disable LTE jamming detection and select reporting mode.

Parameters:

Name	Type	Default	Description
<P_RSRP_T4G>	integer	30	set the threshold of RSRP. The threshold (RSRP_Thr) is calculated as: RSRP_Thr = RSRP_Av*(1-(**<P_RSRP_T4G>**/100)) where RSRP_Av is the average of the last 10 RSRP measures Value: 0÷100 : threshold of RSRP
<P_RSRQ_T4G>	integer	90	set the threshold of RSRQ. The threshold (RSRQ_Thr) is calculated as: RSRQ_Thr= RSRQ_Av*(1+(**<P_RSRQ_T4G>**/100)) where RSRQ_Av is the average of the last 10 RSRQ measures Value: 0÷100 : threshold of RSRQ

Not Subject to NDA

<P_RSSNR_T4G>	integer	40	set the threshold of RSSNR. The threshold (RSSNR_Thr) is calculated as: RSSNR_Thr= RSSNR_Av*(1+(<P_RSSNR_T4G>/100)) where RSSNR_Av is the average of the last 10 RSSNR measures

Value:

0÷100 : threshold of RSSNR

If you change the <P_RSRP_T4G>, <P_RSRQ_T4G>, and <P_RSSNR_T4G> parameter of the AT#JDR4GCFG command, it will be automatically changed the parameters of the AT#JDRENH2 command, without notice, vice versa.

All the parameter settings are saved in NVM memory.

AT#JDR4GCFG?

Read command returns the current settings in the format:

#JDR4GCFG: <P_RSRP_T4G>,<P_RSRQ_T4G>,<P_RSSNR_T4G>

AT#JDR4GCFG=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.4. Network

3.4.1. AT+CNUM - Subscriber Number

This command returns the MSISDN (if the phone number of the device has been stored in the SIM card).

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CNUM

Execution command returns the MSISDN (if the phone number of the device has been stored in the SIM card) in the following format:

+CNUM: <alpha>,<number>,<type>[<CR><LF>
+CNUM: <alpha>,<number>,<type>[...]]

The parameters are described in the Additional info section.

Additional info:

List of the parameters meaning.

Name	Type	Default	Description
<alpha>	string	-	alphanumeric string associated to **<number>**; The character set depends on the value set with **+CSCS**.

Not Subject to NDA

<number>	string	-	numeric string containing the phone number in the format **<type>**
<type>	integer	N/A	type of number
	Values:		
	129	:	national numbering scheme
	145	:	international numbering scheme (contains the character "+")

AT+CNUM=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.2. AT+COPN - Read Operator Names

This command read operator names.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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>[...]]

The parameters are described in the Additional info section.

Additional info:

- List of the parameters meaning.

Name	Type	Default	Description
<numericn>	string	-	operator in numeric format, see **+COPS**.
<alphan>	string	-	operator in long alphanumeric format, see **+COPS**.

Not Subject to NDA

Each operator code <**numericn**> that has an alphanumeric equivalent <**alphan**> in the ME memory is returned.

Because <**alphan**> display to depend on character set (**+CSCS**), <**alphan**> may not be displayed properly.

AT+COPN=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.3. AT+CREG - Network Registration Status

The command enables/disables the network registration unsolicited result code (URC) and selects its presentation format.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CREG=[<mode>]

Set command enables/disables the network registration unsolicited result code and selects one of the two available formats:

short format: **+CREG: <stat>**
long format: **+CREG: <stat>[,<lac>,<ci>[,<AcT>]]**

The parameter meanings are shown in Unsolicited code value section.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the network registration unsolicited result code and selects one of the two formats: shot or long format. URC short format is displayed every time there is a change in the network registration status. URC long format is displayed every time there is a change of the network cell.
	Values:		

Not Subject to NDA

0 : disable the network registration unsolicited result code

1 : enable the network registration unsolicited result code, and selects the short format

2 : enable the network registration unsolicited result code, and selects the long format (includes the network cell identification data)

Unsolicited fields:

Name	Type	Description
<stat>	integer	network registration status of the module Values: 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
<lac>	string	the parameter reports: Local Area Code when <AcT>=0 Tracking Area Code when <AcT>=7
<ci>	string	Cell Id for the currently registered on cell
<AcT>	integer	access technology of the registered network Values: 0 : GSM 2 : UTRAN

Not Subject to NDA

7	:	E-UTRAN

<lac>, <ci> and <AcT> network information is reported by URC only if <mode>=2, and the module is registered on some network cell.

AT+CREG?

Read command returns the current value of <mode>, the registration status <stat>, and the network information (<lac>, <ci> and <AcT>) according to the used <mode> parameter value.

+CREG: <mode>,<stat>[,<lac>,<ci>[,<AcT>]]

<lac>, <ci>, and **<AcT>** network information is reported only if <mode>=2 and the module is registered on some network cell.

AT+CREG=?

Test command returns supported values for parameter <mode>.

Not Subject to NDA

Check the registration status of the module.

AT+CREG?

+CREG: 0,2

OK

The module is in network searching state

...

...

Check again module status

AT+CREG?

+CREG: 0,1

OK

The module is registered

Not Subject to NDA

3.4.4. AT+CLCK - Facility Lock/Unlock

This command is used to lock, unlock, or interrogate a MT or a network facility.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]

Set command is used to lock, unlock, or interrogate a MT or a network facility.

Parameters:

Name	Type	Default	Description
<fac>	string	N/A	facility

Values:

"AB" : All Barring services (applicable only for <mode>=0)

"AC" : All inComing barring services (applicable only for <mode>=0)

"AG" : All outGoing barring services (applicable only for <mode>=0)

"AI" : BAIC (Barr All Incoming Calls)

"AO" : BAOC (Barr All Outgoing Calls)

"IR" : BIC-Roam (Barr Incoming Calls when Roaming outside the home country)

"OI" : BOIC (Barr Outgoing International Calls)

Not Subject to NDA

"OX" : BOIC-exHC (Barr Outgoing International Calls except to Home Country)

"SC" : SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued)

"FD" : SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)

"PN" : Network Personalization

"PU" : network sUbset Personalization

"PP" : service Provider Personalization

"PC" : Corporate Personalization

"PF" : lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PHFSIM) (MT asks password when other than the first SIM/UICC card is inserted)

<mode>	integer	N/A	defines the operation to be done on the facility

Values:

0 : unlock

1 : lock

2 : query status

<passwd>	string	-	shall be the same as password specified for the facility from the MT user interface or with command Change Password **+CPWD**
<class>	integer	7	a sum of integers each representing a class of information

Not Subject to NDA

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

Value:

1÷255 : 1..255

Additional info:

- When **<mode>**=2 and command is successful:

  +CLCK: <status>[,<class1>[<CR><LF>
  +CLCK: <status>,<class2>[...]]

Name	Type	Default	Description
<status>	integer	N/A	the status of the facility
	Values:		
	0 : not active		
	1 : active		

AT+CLCK=?

Test command reports all the facilities supported by the device.

Not Subject to NDA

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
OK
```


Not Subject to NDA

3.4.5. AT+CPWD - Change Facility Password

This command is used to change the password for the facility lock function defined by command Facility Lock **+CLCK**.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	Yes	-	2

AT+CPWD=<fac>,<oldpwd>,<newpwd>

Action command sets a new password for the facility lock function defined by command Facility Lock **+CLCK**.

Parameters:

Name	Type	Default	Description
<fac>	string	N/A	facility

Values:

"AB" : All Barring services

"AC" : All inComing barring services

"AG" : All outGoing barring services

"AI" : BAIC (Barr All Incoming Calls)

"AO" : BAOC (Barr All Outgoing Calls)

"IR" : BIC-Roam (Barr Incoming Calls when Roaming outside the home country)

"OI" : BOIC (Barr Outgoing International Calls)

"OX" : BOIC-exHC (Barr Outgoing International Calls except to Home Country)

Not Subject to NDA

			"SC" : SIM (PIN request) "P2" : SIM PIN2 "PN" : Network Personalization "PU" : network sUbset Personalization "PP" : service Provider Personalization "PC" : Corporate Personalization "PF" : lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PHFSIM) (MT asks password when other than the first SIM/UICC card is inserted)
<oldpwd>	string	-	It shall be the same as password specified for the facility from the MT user interface or with command Change Password **+CPWD**.
<newpwd>	string	-	new password; maximum length of password can be determined with **<pwdlength>**

AT+CPWD=?

Test command returns a list of pairs (**<fac>**,**<pwdlength>**) which present the available facilities and the maximum length of their password.

Additional info:

- the available facilities and the maximum length of their password

Name	Type	Default	Description
<fac>	string	-	facility
<pwdlength>	integer	-	maximum length of the password for the facility

Not Subject to NDA

Not Subject to NDA

3.4.6. AT+CLIR - Calling Line Identification Restriction

The command manages the CLIR service.

3GPP TS 27.007
3GPP TS 22.081

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	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 (see 3GPP TS 22.081), that allows a calling subscriber to enable or disable the presentation of the Calling Line Identification (CLI, i.e., the phone number of the caller) to the called party when originating a call.

This command sets the default behavior of the device in all outgoing calls.

Parameter:

Name	Type	Default	Description
<n>	integer	0	setting of CLIR service

Values:

0 : CLIR facility according to CLIR service network status

1 : CLIR facility active (CLI not sent)

2 : CLIR facility not active (CLI sent)

Not Subject to NDA

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>), in the form

+CLIR: <n>,<m>

Additional info:

▶▶

Name	Type	Default	Description
<n>	integer	0	facility status in the Mobile
	Values:		
	0 : CLIR facility according to CLIR service network status		
	1 : CLIR facility active (CLI not sent)		
	2 : CLIR facility not active (CLI sent)		
<m>	integer	0	facility status in the Network
	Values:		
	0 : CLIR service not provisioned		
	1 : CLIR service provisioned permanently		
	2 : unknown (e.g. no network present)		
	3 : CLI temporary mode presentation restricted		
	4 : CLI temporary mode presentation allowed		

AT+CLIR=?

Not Subject to NDA

Test command reports the supported values of parameter <n>

Not Subject to NDA

3.4.7. AT+COLP - Connected Line Identification Presentation

This command enables/disables the presentation of the COL at the TE.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+COLP=[<n>]

Set command enables/disables the presentation of the COL at the TE. When enabled (and called subscriber allows), the following intermediate result code is returned from TA to TE before any **+CR** or ITU T Recommendation V.250 responses:

+COLP: <number>,<type>[,<subaddr>,<satype>[,<alpha>]]

Parameter:

Name	Type	Default	Description
<n>	integer	0	enable/disable COL indication
	Values:		
	0 : disable COL indication		
	1 : enable COL indication		

Additional info:

- 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.

Not Subject to NDA

It has no effect on the execution of the supplementary service COLR in the network.

Unsolicited fields:

Name	Type	Description
<number>	string	string type phone number of format specified by **<type>**
<type>	integer	type of address octet in integer format Values: 129 : unknown type of number and ISDN/Telephony numbering plan 145 : international type of number and ISDN/Telephony numbering plan (contains the character "+")
<subaddr>	string	string type subaddress of format specified by **<satype>**
<satype>	string	type of subaddress octet in integer format (refer 3GPP TS 24.008 subclause 10.5.4.8)
<alpha>	string	alphanumeric representation of **<number>** corresponding to the entry found in phonebook; used character set should be the one selected with command **+CSCS**

If COL information is needed, it is recommended to set **<mode>** to 1 in **#DIALMODE** command, in order to have network information available for display before returning to command mode.

AT+COLP?

Not Subject to NDA

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>

Additional info:

▶▶ where

Name	Type	Default	Description
<n>	integer	N/A	COL presentation enabled/disabled Values: 0 : COL presentation disabled 1 : COL presentation enabled
<m>	integer	N/A	status of the COLP service Values: 0 : COLP not provisioned 1 : COLP provisioned 2 : unknown (e.g. no network is present)

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 returns the range for the parameter <n>.

Not Subject to NDA

3.4.8. AT+CHLD - Call Holding Services

The command controls the network call hold service.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CHLD=[<n>]

Set command controls the network call hold service. With this service it is e.g. possible to disconnect temporarily a call and keep it suspended while it is retained by the network, or make a multiparty connection.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	the parameter is used to release, activate or add an held call

Values:

0 : releases all held calls, or sets the UDUB (User Determined User Busy) indication for a waiting call.

1 : releases all active calls (if any exist), and accepts the other (held or waiting) call

1X : releases a specific active call X

2 : places all active calls (if any exist) on hold and accepts the other (held or waiting) call.

2X : places all active calls on hold except call X with which communication shall be supported

Not Subject to NDA

3	:	adds an held call to the conversation
4	:	connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer (ECT))

"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.

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.

The command is only applicable to voice calls.

For VoLTE,

11. conference call <n>=2X and <n>=4 parameter not supported.
12. while no active or held calls option <n>=3 starts conference call to conference server without participants.

AT+CHLD=?

Test command returns the list of supported values of parameter <n>.

Not Subject to NDA

3.4.9. AT+CTFR - Call Deflection

This command is used to request a service that causes an incoming alerting call to be forwarded to a specified number.

3GPP TS 22.072

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CTFR=<number>[,<type>[,<subaddr>[,<satype>]]]

Set command is used to request a service that causes an incoming alerting call to be forwarded to a specified number.

This is based on the GSM/UMTS supplementary service CD (Call Deflection, refer 3GPP TS 22.072).

Parameters:

Name	Type	Default	Description
<number>	string	-	string type phone number of format specified by **<type>**
<type>	integer	145	type of address octet in integer format(refer 3GPP TS 24.008 subclause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129

Values:

145 : default value when dialing string includes international access code character "+"

129 : default value when dialing string doesn't include international access code character "+"

Not Subject to NDA

<subaddr>	string	-	string type subaddress of format specified by **<satype>**
<satype>	string	-	type of subaddress octet in integer format (refer 3GPP TS 24.008 subclause 10.5.4.8); default 128

- The interaction of this command with other commands based on other GSM/UMTS supplementary services is described on GSM/UMTS standard.
- Call Deflection is only applicable to an incoming voice call
- Refer subclause **(ME Error Result Code - +CME ERROR: <err>)** for possible **<err>** values.
- Possible response(s): **+CME ERROR: <err>**

AT+CTFR=?

Test command tests for command existence

Not Subject to NDA

3.4.10. AT+CUSD - Unstructured Supplementary Service Data

Set command allows control of the Unstructured Supplementary Service Data (USSD 3GPP TS 22.090).

3GPP TS 27.007
3GPP TS 22.090
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CUSD=[<n>[,<str>[,<dcs>]]]

The unsolicited result code enabled by parameter <n> is in the format:

+CUSD: <m>[,<str>,<dcs>]

Parameters:

Name	Type	Default	Description
<n>	integer	0	disable/enable the presentation of an unsolicited result code Values: 0 : disable the result code presentation 1 : enable the result code presentation 2 : cancel an ongoing USSD session (not applicable to read command response)

Not Subject to NDA

<str>	string	-	USSD-string (when <**str**> parameter is not given, network is not interrogated) 13. If <**dcs**> indicates that 3GPP TS 23.038 default alphabet is used ME/TA converts GSM alphabet into current TE character set (see **+CSCS**). 14. 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>	integer	-	3GPP TS 23.038 Cell Broadcast Data Coding Scheme in integer format (default is 0).

Unsolicited field:

Name	Type	Description
<m>	integer	Status service value Values: 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

Not Subject to NDA

AT+CUSD?

Read command reports the current value of the parameter <n>

AT+CUSD=?

Test command reports the supported values for the parameter <n>

Not Subject to NDA

3.4.11. AT+CAOC - Advice of Charge

This command allows the user to get information about the cost of calls and to enable an unsolicited event reporting of the Current Call Meter (CCM) information.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	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:

Name	Type	Default	Description
<mode>	integer	N/A	mode of presentation of CCM information Values: 0 : query CCM value 1 : disables unsolicited CCM reporting 2 : enables unsolicited CCM reporting

Additional info:

- If **AT+CAOC**=0 is issued, the current CCM value is shown in the format:

  +CCCM: <ccm>

Not Subject to NDA

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)

Unsolicited field:

Name	Type	Description
<ccm>	hex	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)

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.

Not Subject to NDA

+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.

Not Subject to NDA

3.4.12. AT+CLCC - List Current Calls

This command returns the list of current calls and their characteristics

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CLCC

Execution command returns the list of current calls and their characteristics in the format:

[+CLCC:<id$_1$>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[<CR><LF>
+CLCC:<id$_2$>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[...]]]

The parameters are described in the Additional info section.

Additional info:

▶▶ List of the parameters meaning.

Name	Type	Default	Description
<idn>	integer	-	call identification number
<dir>	integer	N/A	call direction Values: 0 : mobile originated call 1 : mobile terminated call
<stat>	integer	N/A	state of the call

Not Subject to NDA

	Values: 0 : active 1 : held 2 : dialing (MO call) 3 : alerting (MO call) 4 : incoming (MT call) 5 : waiting (MT call)		
<mode>	integer	N/A	call type Values: 0 : voice 1 : data 2 : fax (not supported by LTE) 9 : unknown
<mpty>	integer	N/A	multiparty call flag Values: 0 : call is not one of multiparty (conference) call parties 1 : call is one of multiparty (conference) call parties
<number>	string	-	phone number in format specified by **<type>**
<type>	integer	N/A	type of phone number octet in integer format Values: 129 : national numbering scheme

Not Subject to NDA

		145 :	international numbering scheme (contains the character "+")
<alpha>	string	-	alphanumeric representation of <**number**> corresponding to the entry found in phonebook; used character set should be the one selected with **+CSCS**

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

For VOLTE,

15. conference call participant's numbers start with "sip:" or "tel:", for example: sip:+12125551212

AT+CLCC=?

Test command returns **OK** result code

Not Subject to NDA

3.4.13. AT+CSSN - SS Notification

The command refers to supplementary service related network initiated notifications.

- 3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CSSN=[<n>[,<m>]]

Set command enables/disables the presentation of notification result codes from **TA** to **TE**.

Parameters:

Name	Type	Default	Description
<n>	integer	0	Set **+CSSI** result code presentation status When <**n**>=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code is sent to **TE** before any other **MO** call setup result codes **+CSSI: <code1>** Values: 0 : disable 1 : enable
<m>	integer	0	Sets the **+CSSU** result code presentation status When <**m**>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, an

Not Subject to NDA

unsolicited result code is sent to TE
+CSSU: <code2>

Values:

0 : disable

1 : enable

Unsolicited fields:

Name	Type	Description
<code1>	integer	+CSSI supplementary service notification. Values: 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
<code2>	integer	+CSSU supplementary service notification. Values: 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) 5 : call on hold has been released (this is not a SS notification) (during a voice call) 10 : additional incoming call forwarded

Not Subject to NDA

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>.

Not Subject to NDA

3.4.14. AT+CCUG - Closed User Group

This command allows control of the Closed User Group supplementary service.

3GPP TS 27.007
3GPP TS 22.085

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CCUG=[<n>[,<index>[,<info>]]]

Set command enables the served subscriber to select a CUG index, to suppress the Outgoing Access (OA), and to suppress the preferential CUG.

Parameters:

Name	Type	Default	Description
<n>	integer	0	enables/disables the CUG temporary mode

Values:

0 : disable CUG temporary mode

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>	integer	10	Closed Used Group index

Values:

0÷9 : CUG index

10 : no index (preferred CUG taken from subscriber data)

Not Subject to NDA

<info>	integer	0	information added to the CUG

Values:

0 : no information

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 in the format

+CCUG: <n>,<index>,<info>

AT+CCUG=?

Test command returns the **OK** result code

Not Subject to NDA

3.4.15. AT+CPOL - Preferred Operator List

The command is used to edit or update the UICC preferred list of networks. The list is read in the UICC file selected by the command **+CPLS**.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CPOL=[<index>]
[,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,
<UTRAN_AcT>,<E_UTRAN_AcTn>]]]

Execution command writes an entry in the SIM list of preferred operators.

Parameters:

Name	Type	Default	Description
<index>	integer	N/A	the order number of operator in the UICC preferred operator list. Value: 1÷n : order number in the list
<format>	integer	N/A	format for **<oper>** parameter. Values: 0 : long format alphanumeric <oper> 1 : short format alphanumeric <oper> 2 : numeric <oper>
<oper>	string	-	Operator Identifier.

Not Subject to NDA

<GSM_AcT>	integer	N/A	GSM access technology. Values: 0 : access technology not selected 1 : access technology selected
<GSM_Compact_AcT>	integer	N/A	GSM compact access technology. Currently the parameter is not supported but set value is accepted. Values: 0 : access technology not selected 1 : access technology selected
<UTRAN_AcT>	integer	N/A	UTRAN access technology. Currently the parameter is not supported but set value is accepted. Values: 0 : access technology not selected 1 : access technology selected
<E_UTRAN_AcTn>	integer	N/A	E-UTRAN access technology Values: 0 : access technology not selected 1 : access technology selected

Not Subject to NDA

if **<index>** given but **<oper>** left out, the entry deleted. If **<oper>** given but **<index>** left out, **<oper>** put in the next free location. If only **<format>** given, the format of the **<oper>** in the read command changes. Currently **<GSM_Compact_AcT>** not supported but set value is acceptable.

AT+CPOL?

Read command returns all used entries from the UICC list of preferred operators.

AT+CPOL=?

Test command returns the <**index**> range supported by the UICC and the range for the <**format**> parameter.

Not Subject to NDA

Entry 3 in the preferred list of the operators is deleted.

AT+CPOL=3
OK

Operator identifier 22603 is inserted in the next free location of the list.
AT+CPOL=,2,22603
OK

Format of <**oper**> in the read command is changed (only 2 is allowed up to now).
AT+CPOL=,2
OK

Operator Identifier 22603 is inserted in the 4th position of the list.
AT+CPOL=4,2,22603
OK

Available range for <**index**> is 1 to 16, for <**format**>= 2.
AT+CPOL=?
+CPOL: (1-16),(2)

Not Subject to NDA

3.4.16. AT#CODECINFO - Codec Information

This command returns information about the channels codecs.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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>**.

Set command format:

AT#CODECINFO=<format>,<mode>

Execution command format:

AT#CODECINFO

Parameters:

Name	Type	Default	Description
<format>	integer	0	select the return information format: numeric or textual
	Values:		
	0 : numeric format, see info section		
	1 : textual format, see info section		
<mode>	integer	0	enable/disable unsolicited channels codecs information
	Values:		
	0 : disable codec information unsolicited report, see info section		

Not Subject to NDA

1 : enable codec information unsolicited report only if the codec changes, see info section

2 : enable short codec information unsolicited report only if the codec changes, see info section

Additional info:

- <mode>=1, the unsolicited channel mode information is reported according to the <format> parameter value:

  if <format>=0, the URC is:
  #CODECINFO: <codec_used>,<codec_set>

  if <format>=1, the URC is:

  #CODECINFO:
  <codec_used>,<codec_set1>[,<codec_set2>[..[,codec_setn]]]

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

  #CODECINFO: <codec_used>

  The <codec_used> format depends on the <format> parameter value.

- Execution command (**AT#CODECINFO<CR>**) returns immediately channels codecs information according to the previous setting of <format> parameter.

  if <format>=0, the return message is:

  #CODECINFO: <codec_used>,<codec_set>

  if <format>=1, the return message is:

Not Subject to NDA

#CODECINFO: <codec_used>,<codec_set1>[,<codec_set2>[..[,codec_setn]]]

The parameters and their format is described in the Unsolicited code values section.

Unsolicited fields:

Name	Type	Description
<codec_used>	string	<**format**>=0, <**codec_used**> is displayed in numeric format Values: 0 : no TCH 1 : full rate speech 1 on TCH 2 : full rate speech 2 on TCH 4 : half rate speech 1 on TCH 8 : full rate speech 3 – AMR on TCH 16 : half rate speech 3 – AMR on TCH 32 : GSM-AMR Wide band mode 64 : UMTS-AMR Narrow band mode 128 : UMTS-AMR Wide band mode 129 : full data 4.8 130 : full data 2.4 131 : half data 4.8 132 : half data 2.4 133 : full data 14.4 134 : full data 9.6

Not Subject to NDA

<codec_set>	string	<**format**>=0, <**codec_set**> is displayed in numeric format. It is the sum of integers each representing a specific channel codec. channel codec: 1 - FR, full rate mode enabled 2 - EFR, enhanced full rate mode enabled 4 - HR, half rate mode enabled 8 - FAMR, AMR full rate mode enabled 16 - HAMR, AMR half rate mode enabled 32 - AMRWB, GSM-AMR Wide band mode enabled 64 - UAMRNB, UMTS-AMR Narrow band mode enabled 128 - UAMRWB, UMTS-AMR Wide band mode enabled Value: 1..255 : sum of integers each representing a specific channel codec
<codec_used>	string	<**format**>=1, <**codec_used**> is displayed in textual format Values: None : no TCH FR : full rate speech 1 on TCH EFR : full rate speech 2 on TCH HR : half rate speech 1 on TCH FAMR : full rate speech 3 – AMR on TCH HAMR : half rate speech 3 – AMR on TCH AMRWB : GSM-AMR Wide band mode enabled

Not Subject to NDA

		UAMRNB : UMTS-AMR Narrow band mode enabled UAMRWB : UMTS-AMR Wide band mode enabled FD96 : full data 9.6 FD48 : full data 4.8 FD24 : full data 2.4 HD48 : half data 4.8 HD24 : half data 2.4 FD144 : full data 14.4
<codec_setn>	string	<**format**>=1, <**codec_setn**> are displayed in textual format Values: FR : full rate mode enabled EFR : enhanced full rate mode enabled HR : half rate mode enabled FAMR : AMR full rate mode enabled HAMR : AMR half rate mode enabled AMRWB : GSM-AMR Wide band mode enabled UAMRNB : UMTS-AMR Narrow band mode enabled UAMRWB : UMTS-AMR Wide band mode enabled

Not Subject to NDA

The command refers to codec information in speech call, and to channel mode in data/fax call.

If **AT#CODEC=0**, the reported channels codecs set, for <**format**>=0, is 255 (all codecs).

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**> parameters values.

Not Subject to NDA

3.4.17. AT+CPLS - Selection of Preferred PLMN List

The command is used to select a list of preferred PLMNs in the SIM/USIM card.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CPLS=<list>

Set command select one PLMN selector with Access Technology list in the SIM card or active application in the UICC (GSM or USIM), that is used by **+CPOL** command.

Parameter:

Name	Type	Default	Description
<list>	integer	0	PLMNs list selector

Values:

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

The value set by command is directly stored in NVM and doesn't depend on the specific CMUX instance.

Not Subject to NDA

If trying to set + CPLS which is not in supported range, an error would be returned.

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.

Not Subject to NDA

3.4.18. AT+CSQ - Signal Quality

Execution command returns received signal strength indication <**rssi**> and channel bit error rate <**ber**> from the MT.

[1] 3GPP TS 27.007
[2] 3GPP TS 07.07
[3] 3GPP TS 25.133

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CSQ

See Additional info sections.

Additional info:

2G Networks

The execution command returns the following message:

+CSQ: <rssi>,<sq>

Name	Type	Default	Description
<rssi>	integer	N/A	measurements of the radio signal power, expressed in dBm, are mapped to <**rssi**> as shown below

Values:

0 : -113 dBm or less

1 : -111 dBm

Not Subject to NDA

2÷30 : -109 dBm ... -53 dBm; 2 dBm per step

31 : -51 dBm or greater

99 : not known or not detectable

<sq>	integer	N/A	<sq>: signal quality measurements of the channel BER(bit error rate), expressed in %, are mapped to <sq> as shown below

Values:

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

▶▶ 4G Networks

The execution command returns the following message:

+CSQ: <rssi>,<sq>

Name	Type	Default	Description
<rssi>	integer	N/A	Received Signal Strength Indication. For **<rssi>** to be compliant with 3GPP

Not Subject to NDA

			TS27.007 specification, levels are mapped to range 0...31. Values: 0 : -113 dBm or less 1 : -111 dBm 2÷30 : -109...-53 dBm 31 : - 51 dBm or greater 99 : not known or not detectable
<sq>	integer	N/A	<sq>: signal quality RSRQ: Reference Signal Received Quality. For <sq> levels are mapped to range 0...7. Values: 0 : -4...-3 dBm 1 : -6...-5 dBm 2 : -8...-7 dBm 3 : -10...-9 dBm 4 : -13...-11 dBm 5 : -15...-14 dBm 6 : -17...-16 dBm 7 : -19...-18 dBm 99 : not known or not detectable

Not Subject to NDA

▶▶ 3G Networks

The execution command returns the following message:

+CSQ: <rssi>,<ecio>

Name	Type	Default	Description
<rssi>	integer	N/A	Received Signal Strength Indication. For **<rssi>** to be compliant with 3GPP TS27.007 specification, levels are mapped to range 0...31. Values: 0 : -113 dBm or less 1 : -111 dBm 2÷30 : -109...-53 dBm 31 : - 51 dBm or greater 99 : not known or not detectable
<sq>	integer	N/A	<sq>: signal quality Eclo: the signal-to noise ratio. For <sq> levels are mapped to range 0...7. Values: 0 : -1...0 dBm 1 : -5...-2 dBm 2 : -8...-6 dBm 3 : -11...-9 dBm 4 : -15...-12 dBm

Not Subject to NDA

5 : -18...-16 dBm

6 : -22...-19 dBm

7 : -24...-23 dBm

99 : not known or not detectable

▶▶ TDSCDMA Networks

The execution command returns the following message:

+CSQ: <rssi>,<ecio>

Name	Type	Default	Description
<rssi>	integer	100	Received Signal Strength Indication. For <**rssi**> levels are mapped to range 100...191.
	Values:		
	100	:	-116 dBm or less
	101	:	-115
	102÷190	:	-114...-26 dBm
	191	:	- 25 dBm or greater
	199	:	not known or not detectable
<sq>	integer	0	<sq>: signal quality Eclo: the signal-to noise ratio. For <sq> levels are mapped to range 0...7.
	Values:		
	0	:	-1...0 dBm

Not Subject to NDA

1	:	-5...-2 dBm
2	:	-8...-6 dBm
3	:	-11...-9 dBm
4	:	-15...-12 dBm
5	:	-18...-16 dBm
6	:	-22...-19 dBm
7	:	-24...-23 dBm
99	:	not known or not detectable

NOTE: this command should be used instead of the **%Q** and **%L** commands, since GSM/WCDMA relevant parameters are the radio link ones and no line is present, hence **%Q** and **%L** have no meaning

AT+CSQ=?

Test command returns the supported range of values of the parameters **<rssi>** and **<ber>**.

Although **+CSQ** is an execution command without parameters, 3GPP TS 27.007 requires the Test command to be defined.

Not Subject to NDA

3.4.19. AT#SERVINFO - Serving Cell Information

This command reports information about the serving cell.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SERVINFO

Execution command reports information about serving cell. The information and the format of the returned message depends on the network type.

GSM network

#SERVINFO:<BARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<BSIC>,<LAC>,<TA>,<GPRS>[,[<PBARFCN>],[<NOM>],<RAC>,[PAT]]

LTE network

#SERVINFO:<EARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<PhysicalCellId>,<TAC>,<DRX>,<SD>,<RSRP>

The parameters are described in the Additional info sections.

Additional info:

- Parameters meaning.

Name	Type	Default	Description
<dBM>	integer	-	received signal strength in dBm.
<NetNameAsc>	string	-	operator name, quoted string or "" if network name is unknown.
<NetCode>	hex	-	country code and operator code.
<LAC>	integer	-	Localization Area Code

Not Subject to NDA

<BSIC>	string	-	Base Station Identification Code
<TA>	integer	-	Time Advance: it is available only if a GSM or GPRS is running.
<GPRS>	integer	0	GPRS supported in the cell Values: 0 : not supported 1 : supported
<BARFCN>	integer	-	BCCH ARFCN of the serving cell

▶▶ Parameters meaning.

Name	Type	Default	Description
<NOM>	string	N/A	Network Operator Mode. Values: I : Network Mode I II : Network Mode II III : Network Mode III
<RAC>	integer	-	Routing Area Color Code.
<URA>	integer	-	UTRAN Registration Area Identity

▶▶ Parameters meaning.

Name	Type	Default	Description
<DRX>	integer	-	Discontinuous reception cycle length.

Not Subject to NDA

<SD>	integer	N/A	Service Domain Values: 0 : No Service 1 : CS only 2 : PS only 3 : CS & PS
<RSCP>	integer	-	Received Signal Code Power in dBm.
<EARFCN>	integer	-	LTE Assigned Radio Channel
<PhysicalCellId>	integer	-	Physical Cell ID
<TAC>	integer	-	Tracking Area Code
<RSRP>	integer	-	Reference Signal Received Power

▶▶ Parameters meaning.

Name	Type	Default	Description
<PBARFCN>	integer	-	Not supported by 3GPP. PBCCH ARFCN of the serving cell; it is printed only if PBCCH is supported by the cell, otherwise the label **"hopping"** will be printed
<PAT>	integer	N/A	Priority Access Threshold. Values: 0 : Priority Access Threshold 3÷6 : Priority Access Threshold

Not Subject to NDA

AT#SERVINFO=?

Test command returns **OK** result code.

Not Subject to NDA

3.4.20. AT#NWEN - Network Emergency Number Update

This command enables the unsolicited result code of emergency number update.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#NWEN=[<en>]

Set command enables/disables the URC for emergency number update.
The URC format is:

#NWEN: <type>

The parameter is described in the Unsolicited field section.

Parameter:

Name	Type	Default	Description
<en>	integer	0	enables/disables unsolicited indication of emergency number update Values: 0 : disable 1 : enable

Unsolicited field:

Name	Type	Description
<type>	integer	unsolicited indication of emergency number update Values: 1 : number list update from internal ME 2 : number list update from SIM

Not Subject to NDA

3	:	number list update from network

Entering **AT#NWEN=** returns **OK** but has no effect.

AT#NWEN?

Read command reports whether the unsolicited indication of network emergency number update is currently enabled or not, in the format:

#NWEN: <en>

AT#NWEN=?

Test command reports the range for the parameter **<en>**

Not Subject to NDA

3.4.21. AT#BCCHLOCK - Lock to Single BCCH ARFCN

This command enables/disable the single BCCH ARFCN locking.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#BCCHLOCK=<LockedBcch>[,<LockedUarfcn>[,<LockedPsc>[,<LockedEarfcn>[,<LockedPci>]]]]

This command allows to set the single BCCH ARFCN(also UARFCN and EARFCN) the device must be locked to, selectable within those allowed for the specific product.

Parameters:

Name	Type	Default	Description
<LockedBcch>	integer	1024	enable/disable 2G BCCH locking
	Values:		
	1024	:	disable
	0÷124	:	enable on GSM 900MHz
	975÷1023	:	enable on GSM 900MHz
	512÷885	:	enable on DCS 1800MHz
	128÷251	:	enable on GSM 850MHz
	512÷810	:	enable on PCS 1900MHz
<LockedUarfcn>	integer	0	enable/disable 3G BCCH locking
	Values:		
	0	:	disable
	712÷10838	:	enable on downlink UARFCN in UMTS supported bands (some values in range 712-10838 are not

Not Subject to NDA

			supported according to product band configuration).
<LockedPsc>	integer	65535	enable/disable 3G BCCH locking Primary Scrambling Code selection Values: 65535 : disable 0÷511 : Primary Scrambling Code
<LockedEarfcn>	integer	0	A number in the range 0-68935 representing the earfcn to search. An value of 0 will remove the earfcn restriction and any associated Physical Cell ID lock. Values: 0 : disable 0÷68935 : enable on downlink EARFCN in LTE supported bands (some values in range 0-68935 are not supported according to product band configuration).
<LockedPci>	hex	0	E-UTRAN physical cell ID in hexadecimal format. Valid range 0 - 1F7. If the value 0 of <LockedEarfcn> is input, this value would be 0. Values: 0 : Physical cell id 0÷1F7 : Physical cell id

The values set by command are directly stored in NVM and need to be reboot for lock and unlock function.

Not Subject to NDA

- Note that the use of **<LockedPsc>** must be used with **<LockedUarfcn>** and never use **<LockedPsc>** alone. In other words, if **<LockedUarfcn>** is 0, **<LockedPsc>** must not have a specific value other than 65535. If you set **<LockedPsc>** alone, the problems of 3G search or attach procedure should be happened. However, make it to 65535(disable) alone is possible regardless of **<LockedUarfcn>.**
- It is not possible to lock to a 2G BCCH and a 3G BCCH at the same time.
- If selected locked 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.
- If selected locked 2G BCCH is not in power scan list, the locking function does not work and normal cell selection is performed.
- 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.
- 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 or UARFCN.
- 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.
- If selected locked 3G BCCH is available, the module, in UMTS connection, will not perform handover to another cell/UARFCN.
- If locked 3G BCCH is set through **<LockedUarfcn>**, the 3G rat is fixed. It means **+WS46** cannot be used for moving another RAT. If **<LockedUarfcn>** is set to 0(disable), the **+WS46** would return to the previously value.
- **#BCCHLOCK** setting implies a RAT selection, that is why it is not recommended to use this command together with **+WS46**.

Not Subject to NDA

#BCCHLOCK setting has higher priority than PLMN selection, that is why it is not recommended to use this command together with manual PLMN selection **+COPS=1**.

In the situation that LTE locked function is used so certain frequency and PCI should be fixed, if the handover event comes down from the network or it is in poor signal strength environment, the RLF may occur continuously. Also, event if reselection event is happened on itself, it cannot move another cells or frequencies. So, this function should be used carefully.

AT#BCCHLOCK?

Read command reports the currently stored parameter **<LockedBcch>,<LockedUarfcn>,<LockedPsc>,<LockedEarfcn>** and **<LockedPci>** in the format:

#BCCHLOCK:
<LockedBcch>,<LockedUarfcn>,<LockedPsc>,<LockedEarfcn>,<LockedPci>

If **<LockedEarfcn>** is set to 0, the related EFS would be removed so **<LockedPci>** always returned 0 even if its value was input.

AT#BCCHLOCK=?

Test command reports the supported range of values for parameter **<LockedBcch>,<LockedUarfcn>,<LockedPsc>,<LockedEarfcn>** and **<LockedPci>**.

Not Subject to NDA

3.4.22. AT#PLMNMODE - PLMN List Selection

Set command apply to new operator names depending on the parameter <mode>.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#PLMNMODE=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	1	Set command apply's to new operator names depending on the parameter <mode>

Values:

0 : previous operator names

1 : new operator names

If the **<mode>**=1, **AT+COPN** command shows new operator names.

When the AT**#ENS** value is 1 then the AT**#PLMNMODE** value will always be 1 after reboot. (See **#ENS** for more details).

AT#PLMNMODE?

Read command returns current value of the parameter <mode>:

#PLMNMODE: <mode>

Not Subject to NDA

AT#PLMNMODE=?

Test command returns the supported range of values for parameter <mode>.

Not Subject to NDA

3.4.23. AT#FPLMN - Periodical FPLMN Cleaning

Periodically delete the Forbidden PLMN list stored inside the SIM card, clear it or list it.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#FPLMN=<action>[,<period>]

The set command is used to manage the Forbidden PLMN List file (FPLMN) stored in the SIM card.

Parameters:

Name	Type	Default	Description
<action>	integer	0	kind of action for FPLMN file Values: 0 : disable periodic FPLMN cleaning 1 : enable periodic FPLMN cleaning with period <period> 2 : clear FPLMN file contents (one shot) 3 : list contents of FPLMN file
<period>	integer	60	interval in minutes for FPLMN clearing Value: 1÷60 : interval in minutes

AT#FPLMN?

Read command reports whether the periodic deletion is currently enabled or not, and the deletion period, in the format:

#FPLMN: <action>,<period>

Not Subject to NDA

AT#FPLMN=?

Test command reports available values for parameters **<action>** and **<period>**

Not Subject to NDA

3.4.24. AT#CODEC - GSM and UMTS Audio Codec

GSM and UMTS audio codec mode settings

3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#CODEC=[<codec>]

Set command sets the GSM and UMTS audio codec mode.

Parameter:

Name	Type	Default	Description
<codec>	integer	0	0 = all the codec modes are enabled 1-255: sum of integers each representing a specific codec mode as follows - 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

Value:

0÷255 : codec modes setting

Not Subject to NDA

- Full rate mode is added by default to any setting in the SETUP message (as specified in 3GPP TS 24.008), but the call drops if the network assigned codec mode has not been selected by the user.
- **AT#CODEC=4** and **AT#CODEC=16** are not recommended; better using **AT#CODEC=5** and **AT#CODEC=24** respectively
- The setting 0 is equivalent to the setting 255.

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>

- **AT#CODEC=14**
  OK

  sets the codec modes HR (4), EFR (2) and AMR-FR (8)

Not Subject to NDA

3.4.25. AT#BND - Select Band

This command selects RF bands

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#BND=<band>[,<UMTS_band>[,<LTE_band>[,<TDSCDMA_band>]]]

Set command selects the current GSM, UMTS, LTE, and TDSCDMA bands.

Parameters:

Name	Type	Default	Description
<band>	integer	N/A	GSM band selection. The default value depends on the product. Values: 0 : GSM 900 MHz + DCS 1800 MHz 1 : GSM 900 MHz + PCS 1900 MHz 2 : GSM 850 MHz + DCS 1800 MHz 3 : GSM 850 MHz + PCS 1900 MHz 4 : GSM 900 MHz + DCS 1800 MHz + PCS 1900 MHz 5 : GSM 900 MHz + DCS 1800 MHz + PCS 1900 MHz + GSM 850 MHz
<UMTS_band>	integer	N/A	UMTS band selection. The default value depends on the product. Values: 0 : B1 (2100 MHz)

Not Subject to NDA

1 : B2 (1900 MHz)

2 : B5 (850 MHz)

3 : B1 (2100 MHz) + B2 (1900 MHz) + B5 (850 MHz)

4 : B2 (1900 MHz) + B5 (850 MHz)

5 : B8 (900 MHz)

6 : B1 (2100 MHz) + B8 (900 MHz)

7 : B4 (1700 MHz)

8 : B1 (2100 MHz) + B5 (850 MHz)

9 : B1 (2100 MHz) + B8 (900 MHz) + B5 (850 MHz)

10 : B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz)

11 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B8 (900 MHz)

12 : B6 (800 MHz)

13 : B3 (1800 MHz)

14 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz)

15 : B1 (2100 MHz) + B8 (900 MHz) + B3 (1800 MHz)

16 : B8 (900 MHz) + B5 (850 MHz)

17 : B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz)

18 : B1 (2100 MHz) + B5 (850 MHz) + B6 (800 MHz) + B8 (900 MHz)

19 : B2 (1900 MHz) + B6 (800 MHz)

Not Subject to NDA

20 : B5 (850 MHz) + B6 (800 MHz)

21 : B2 (1900 MHz) + B5 (850 MHz) + B6 (800 MHz)

22 : B1 (2100 MHz) + B3 (1800 MHz) + B5 (850 MHz) + B8 (900 MHz)

23 : B1 (2100 MHz) + B3 (1800 MHz)

24 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz)

25 : B19 (850 MHz)

26 : B1 (2100 MHz) + B5 (850 MHz) + B6 (800 MHz) + B8 (900 MHz) + B19 (850 MHz)

27 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz) + B8 (900 MHz) + B19 (850 MHz)

<LTE_band>	hex	N/A	indicates the LTE supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 32 bits):

Values:

0x00000 : No bands allowed

0x00001 : EUTRAN BAND1

0x00002 : EUTRAN BAND2

0x00004 : EUTRAN BAND3

0x00008 : EUTRAN BAND4

0x00010 : EUTRAN BAND5

0x00040 : EUTRAN BAND7

0x00080 : EUTRAN BAND8

Not Subject to NDA

			0x00800 : EUTRAN BAND12 0x01000 : EUTRAN BAND13 0x02000 : EUTRAN BAND14 0x10000 : EUTRAN BAND17 0x80000 : EUTRAN BAND20 0x1000000 : EUTRAN BAND25 0x2000000 : EUTRAN BAND26 0x8000000 : EUTRAN BAND28 0x00200000000 : EUTRAN BAND34 0x02000000000 : EUTRAN BAND38 0x04000000000 : EUTRAN BAND39 0x08000000000 : EUTRAN BAND40 0x10000000000 : EUTRAN BAND41 0x8000000000000 : EUTRAN BAND66 0x0800000000000000 : EUTRAN BAND71
<TDSCDMA_band>	hex	N/A	indicates the LTE supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 32 bits): Values: 0x00000 : No bands allowed 0x00001 : TDS BAND34 A 0x00020 : TDS BAND39 F 0x00010 : TDS BAND40 E

Not Subject to NDA

- **127** - GSM/WCDMA invalid value
- **FFFFFFFFFFFFFFFF** - LTE/TDSCDMA invalid value for all models
- In set command **LTE/TDSCDMA band mask** should be entered in HEX format without **"0x"**.

  In Read and test commands it also appears without "0x".
- In set command, "NULL" input value is acceptable except last input parameter.

  And "NULL" means that previous value is remained.

  Example:

  AT#BND=5,15,800C5

  OK

  AT#BND=5,,800C5

  OK
- 7.1 Appendix A represents default value of each variants.
- If **<mode>** of **#SELBNDMODE** is 1, the bands of **#BND** cannot be set. On the other hands, if **<mode>** of **#SELBNDMODE** is 0, the bands of **#BND** can be set.

AT#BND?

Read command returns the current selected band in the format:

In case module does not support TDS-CDMA

#BND: <band>,<UMTS_band>,<LTE_band>

In case module supports TDS-CDMA

#BND: <band>,<UMTS_band>,<LTE_band>,<TDSCDMA_band>

Not Subject to NDA

AT#BND=?

Test command returns the supported range of values of parameters

In case module does not support TDS-CDMA

<band>, <UMTS_band> and <LTE_band>

In case module supports TDS-CDMA

<band>, <UMTS_band>,<LTE_band>, and <TDSCDMA_band>

Set command

AT#BND=5,15,800C5

OK

AT#BND=5,,800C5

OK

Test command

AT#BND=?

#BND: (0-5),(0,5,6,13,15),(800C5)

OK

Read command

AT#BND?

#BND: 5,15,800C5

OK

Read command shows that the supported LTE bands are: B1, B3, B7, B8, and B20

Not Subject to NDA

3.4.26. AT#AUTOBND - Automatic Band Selection

This command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#AUTOBND=[<value>]

Parameter:

Name	Type	Default	Description
<value>	integer	0	only for backward compatibility.
	Values:		
	0 : only for backward compatibility.		
	1 : only for backward compatibility.		
	2 : only for backward compatibility.		

AT#AUTOBND?

Read command returns the current value of the parameter **<value>** in the format:

#AUTOBND: <value>

AT#AUTOBND=?

Test command returns the supported values for parameter **<value>**.

Not Subject to NDA

3.4.27. AT#SNUM - Subscriber Number

This command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file.

3GPP TS 51.011

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SNUM=<index>[,<number>[,<alpha>]]

This set command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file.

Parameters:

Name	Type	Default	Description
<index>	integer	-	the number of the record in the EFmsisdn file in SIM where the number must be stored; its range goes from 1 to a maximum value that varies from SIM to SIM. If only <**index**> value is given, then the EFmsisdn record in location <**index**> is deleted.
<number>	string	-	string containing the phone number
<alpha>	string	-	alphanumeric string associated to <**number**>; its maximum length varies from SIM to SIM. 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

Not Subject to NDA

string is given (""), the corresponding <**alpha**> will be an empty string.

The command returns **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 51.011.

AT#SNUM=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.28. AT#PSNT - Packet Service Network Type

The command enables/disables unsolicited result code for packet service network type (PSNT)

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PSNT=[<mode>]

Set command enables/disables unsolicited result code for packet service network type (PSNT) having the following format:

#PSNT:<nt>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables PSNT unsolicited result code.

Values:

0 : disables PSNT unsolicited result code

1 : enables PSNT unsolicited result code

2 : PSNT unsolicited result code is enabled, and read command returns the message shown in the read section.

Unsolicited fields:

Name	Type	Description
<nt>	integer	network type Values:

Not Subject to NDA

		0 : GPRS network 1 : EGPRS network 2 : WCDMA network 3 : HSDPA network 4 : LTE network 5 : unknown or not registered
<is_hsupa_available>	integer	HSUPA available Values: 0 : HSUPA is not supported by network 1 : HSUPA is supported by network
<is_hsupa_used>	integer	HSUPA used Values: 0 : HSUPA is not in used 1 : HSUPA is in used
<is_hsdpa_available>	integer	HSDPA available Values: 0 : HSDPA is not supported by network 1 : HSDPA is supported by network
<is_hsdpa_used>	integer	HSDPA used Values: 0 : HSDPA is not in used 1 : HSDPA is in used

Not Subject to NDA

When the type of network is HSPA, the indication is certainly valid during traffic, while it could be not valid in idle because it depends on network broadcast parameters.

AT#PSNT?

If <mode> is set to 0 or 1, read command returns the current values of the <mode> and <nt> parameters in the format:

#PSNT: <mode>,<nt>

If <mode> is set to 2, read command returns the current values of <mode> and <nt> parameters followed by four dummy parameters set to 0.

#PSNT:<mode>,<nt>,0,0,0,0

AT#PSNT=?

Test command reports the range for the parameter <mode>

Not Subject to NDA

3.4.29. AT#ENCALG - Set Encryption Algorithm

This command enables or disables the GSM and/or GPRS encryption algorithms supported by the module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENCALG=[<encGSM>][,<encGPRS]

Set command enables or disables the GSM and/or GPRS encryption algorithms supported by the module.

Parameters:

Name	Type	Default	Description
<encGSM>	integer	5	The <**encGSM**> (one byte long) is a bit mask where each bit, when set, indicates the corresponding GSM encryption algorithm 16. **bit 0** = A5/1 17. **bit 1** = A5/2 18. **bit 2** = A5/3 19. **bits 3 - 7** = reserved for future use Values: 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>	integer	7	The <**encGPRS**> (one byte long) is a bit mask where each bit, when set, indicates the corresponding GPRS encryption algorithm

Not Subject to NDA

20. **bit 0** = GEA1
21. **bit 1** = GEA2
22. **bit 2** = GEA3
23. **bits 3 - 7** = reserved for future use

Values:

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

The values are stored in NVM and available on following reboot.

For possible <**encGSM**> and <**encGPRS**> encryptions see test command response.

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 <**usedGSM**> and <**usedGPRS**> in the format:

#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>

Additional info:

Last used <**useGSM**> and <**useGPRS**> are expressed in the format:

Name	Type	Default	Description

Not Subject to NDA

<usedGSM>	integer	1	GSM encryption algorithm
	Values:		
	0	:	no GSM encryption algorithm
	1	:	A5/1
	2	:	A5/2
	3	:	A5/3
	255	:	not available
<usedGPRS>	integer	3	GPRS encryption algorithms
	Values:		
	0	:	no GPRS encryption algorithm
	1,2	:	GEA1, GEA2
	4	:	GEA3
	255	:	not available

AT#ENCALG=?

Test command reports the supported range of values for parameters in the format:

<**encGSM**> and <**encGPRS**>.

Not Subject to NDA

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

Not Subject to NDA

3.4.30. AT+CEMODE - Set Mode of Operation for EPS

This command used to configure the mode of operation for EPS.

3GPP TS 24.301

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+CEMODE=[<mode>]

This set command configures the mode of operation for EPS.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	mode of operation. The default value depends on product. UE modes of operation can be found in 3GPP TS 24.301. Other values are reserved and will result in an **ERROR** response to the set command.

Values:

0 : PS mode 2 of operation

1 : CS/PS mode 1 of operation

2 : CS/PS mode 2 of operation

3 : PS mode 1 of operation

The default value of parameter <mode> is 2 in LE910C1-Sx series(LE910C1-SA, LE910C1-ST,LE910C1-SV) and AT&T operator.

Not Subject to NDA

The definition for UE modes of operation can be found in 3GPP TS 24.301 [83]. Other values are reserved and will result in an ERROR response to the set command.

AT+CEMODE?

Read command returns the current value of parameter <**mode**> in the format:

+CEMODE: < mode >

The read command will return right values after set command, but effectively the mode of operation changes after power cycle.

AT+CEMODE=?

Test command returns the supported range of values of parameters <**mode**>.

Set EPS mode
AT+CEMODE=1
OK

Check EPS mode
AT+CEMODE?
+CEMODE: 1
OK

Not Subject to NDA

3.4.31. AT+CPNER - Primary Notification Event Reporting

This command enables/disables reporting of primary notification events received from the network.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CPNER=<reporting>

Set command enables and disables reporting of primary notification events when received from the network with unsolicited result code.

+CPNERU: <message_identifier>,<serial_number>,<warning_type>

Primary notification events are used for public warning systems like ETWS (Earthquake and Tsunami Warning Systems).

Parameter:

Name	Type	Default	Description
<reporting>	integer	1	Controlling reporting of primary notification events.

Values:

0 : Disable primary notification events.

1 : Enable reporting of primary notification events without security information, unsolicited result code

Unsolicited fields:

Name	Type	Description
<message_identifier>	string	in hexadecimal character format. The parameter contains the message identifier (2 bytes) of the primary notification.

Not Subject to NDA

<serial_number>	string	in hexadecimal character format. The parameter contains the serial number (2 bytes) of the primary notification.
<warning_type>	string	in hexadecimal character format. The parameter contains the warning type (2 bytes) of the primary notification.

AT+CPNER?

Read command reports the current value of the parameter.

AT+CPNER=?

Test command returns supported of parameter.

```
AT+CPNER?
+CPNER: 1
OK
```


Not Subject to NDA

3.4.32. AT+CESQ - Extended Signal Quality

Execution command returns received signal quality parameters according to the network on which the module is registered.

[1] 3GPP TS 27.007
[2] 3GPP TS 45.008
[3] 3GPP TS 25.133
[4] 3GPP TS 36.133

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CESQ

See Additional info section for networks on which the module can be registered.

Additional info:

- The execution command returns the following message. Its format depends on the network on which the module is registered.

2G Networks

+CESQ: <rxlev>,<ber>,255,255,255,255

3G Networks

+CESQ: 99,99,<rscp>,<ecno>,255,255

LTE Networks

Not Subject to NDA

+CESQ: 99,99,255,255,<rsrq>,<rsrp>

Name	Type	Default	Description
<rxlev>	integer	N/A	received signal strength level, see 3GPP TS 45.008 subclause 8.1.4. Values: 0 : rssi < -110 dBm 1 : -110 dBm ≤ rssi < -109 dBm 2 : -109 dBm ≤ rssi < -108 dBm ... : ... 61 : - 50 dBm ≤ rssi < - 49 dBm 62 : - 49 dBm ≤ rssi < -48 dBm 63 : - 48 dBm ≤ rssi 99 : not known or not detectable or if the current serving cell is not a GERAN cell
<ber>	integer	N/A	channel bit error rate. Values: 0÷7 : as RXQUAL values, see 3GPP TS 45.008 subclause 8.2.4 99 : not known or not detectable or if the current serving cell is not a GERAN cell
<rscp>	integer	N/A	received signal code power (see 3GPP TS 25.133 subclause 9.1.1.3 and 3GPP TS 25.123 subclause 9.1.1.1.3). Values:

Not Subject to NDA

	0 : rscp < -120 dBm		
	1 : -120 dBm ≤ rscp < -119 dBm		
	2 : -119 dBm ≤ rscp < -118 dBm		
	... : ...		
	94 : -27 dBm ≤ rscp < -26 dBm		
	95 : -26 dBm ≤ rscp < -25 dBm		
	96 : -25 dBm ≤ rscp		
	255 : not known or not detectable or if the current serving cell is not a UTRA cell		
<ecno>	integer	N/A	ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 subclause).
	Values:		
	0 : Ec/Io < -24 dB		
	1 : -24 dB ≤ Ec/Io < -23.5 dB		
	2 : -23.5 dB ≤ Ec/Io < -23 dB		
	... : ...		
	95 : -1 dB ≤ Ec/Io < -0.5 dB		
	96 : -0.5 dB ≤ Ec/Io < 0 dB		
	97 : 0 dB ≤ rsrp		
	255 : not known or not detectable or if the current serving cell is not a UTRA cell		
<rsrq>	integer	0	reference signal received quality, see 3GPP TS 36.133 subclause 9.1.7.

Not Subject to NDA

Values:

0	:	rsrq < -19.5 dB
1	:	-19.5 dB ≤ rsrq < -19.0 dB
2	:	-19.0 dB ≤ rsrq < -18.5 dB
...	:	...
32	:	-4 dB ≤ rsrq < -3.5 dB
33	:	-3.5 dB ≤ rsrq < -3 dB
34	:	-3 dB ≤ rsrq
255	:	not known or not detectable or if the current serving cell is not a E-UTRA cell

<rsrp>	integer	0	reference signal received power, see 3GPP TS 36.133 subclause 9.1.4.

Values:

0	:	rsrp < -140 dBm
1	:	-140 dBm ≤ rsrp < -139 dBm
2	:	-139 dBm ≤ rsrp < -138 dBm
...	:	...
95	:	-46 dBm ≤ rsrp < -45 dBm
96	:	-45 dBm ≤ rsrp < -44 dBm
97	:	-44 dBm ≤ rsrp
255	:	not known or not detectable or if the current serving cell is not a E-UTRA cell

AT+CESQ=?

Not Subject to NDA

Test command returns values supported as compound values.

Not Subject to NDA

3.4.33. AT#ENS - Enhanced Network Selection

Set command is used to activate the Enhanced Network Selection (ENS) functionality.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENS=[<mode>]

Set command is used to activate the ENS functionality

Parameter:

Name	Type	Default	Description
<mode>	integer	1	ENS functionality Values: 0 : Disable ENS functionality 1 : Enable ENS functionality

If AT#ENS=1 has been issued, the following values will be automatically set and also at every next power-up:

24. All bands are enabled
25. SIM Application Toolkit enabled on user interface 0 if not previously enabled on a different user interface (AT#STIA-2)
26. PLMN list not fixed (AT#PLMNMODE=1)

AT#ENS?

Read command reports whether the ENS functionality is currently enabled or not, in the format:

#ENS: <mode>

Not Subject to NDA

AT#ENS=?

Test command reports the available range of values for parameter **<mode>**

Not Subject to NDA

3.4.34. AT+WS46 - PCCA STD-101 Select Wireless Network

This command selects the cellular network (Wireless Data Service, WDS).

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+WS46=[<n>]

Set command selects the cellular network (Wireless Data Service, WDS) to operate with the **TA** (WDS-Side Stack Selection).

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	WDS-Side Stack to be used by the **TA**. 4G/3G products support **<n>** parameter values 22, 28 and 31. 31 is factory default 4G/3G/2G products support **<n>** parameter values 12,22,25,28,29,30 and 31. 25 is factory default 4G/3G/2G/TDSCDMA products support **<n>** parameter values 12,22,25,28,29,30,31,32,33,34,35,36,37,38 and 39. 36 is factory default Values: 12 : GSM Digital Cellular Systems, GERAN only

Not Subject to NDA

22 : UTRAN only

25 : 3GPP Systems (GERAN and UTRAN and E-UTRAN)

28 : E-UTRAN only

29 : GERAN and UTRAN

30 : GERAN and E-UTRAN

31 : UTRAN and E-UTRAN

32 : TDSCDMA only

33 : GERAN and TDSCDMA

34 : TDSCDMA and E-UTRAN

35 : GERAN and TDSCDMA and E-UTRAN

36 : GERAN and TDSCDMA and UTRAN and E-UTRAN

37 : GERAN and TDSCDMA and UTRAN

38 : TDSCDMA and UTRAN

39 : TDSCDMA and UTRAN and E-UTRAN

The values in **<n>** for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned.

<n> parameter setting is stored in NVM and available at next reboot.

The factory default value depends on each variant.

LE910Cx-NA/EU/LA/E1: 3GPP Systems (GERAN and UTRAN and E-UTRAN)

LE910Cx-AP/NF/N1/A1/L1 : UTRAN and E-UTRAN

LE910Cx-NS/SV/SA/ST: E-UTRAN only

Not Subject to NDA

LE910Cx-CN: GERAN and TDSCDMA and UTRAN and E-UTRAN

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>**.

Not Subject to NDA

3.4.35. AT+CEDRXS - eDRX Setting

This command controls the setting of the UEs eDRX parameters.

3GPP TS 27.007
3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+CEDRXS=[<mode>[,<AcTtype>[,<Req_eDRX>]]]

Set command controls the setting of the UEs eDRX parameters. The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of **<AcTtype>**.

Values:

0 : disable the use of eDRX

1 : enable the use of eDRX

2 : enable the use of eDRX and enable the unsolicited result code, see Additional info.

3 : disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values

Not Subject to NDA

<AcTtype>	integer	N/A	type of access technology. Values: 1 : CAT M1 2 : GSM (A/Gb mode) 3 : UTRAN (lu mode) 4 : E-UTRAN (WB-S1 mode) 5 : E-UTRAN (NB1-S1 mode)
<Req_eDRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008, Table 10.5.5.32/3GPP TS 24.008. Default value is "0000".

Additional info:

- If **<mode>=2** and there is a change in the eDRX parameters provided by the network, the unsolicited result code reports:

  +CEDRXS:
  <AcTtype>[,<Req_eDRX>[,<NW_prove_DRX>[,<PagTimeWindow>]]]

Name	Type	Default	Description
<NW_prove_DRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of

Not Subject to NDA

			3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<PagTimeWindow>	string	-	half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

The only '4 - E-UTRAN (WB-S1 mode)' of **<AcT-type>** could be supported.

Need to input together with **<AcT-type>** and **<Requested_eDRX_value>** values when the '1 - enable the use of eDRX' and '2 - enable the use of eDRX and enable the unsolicited result code' of **<mode>** is set. Also, it needs to be added quotation marks if **<Requested_eDRX_value>** is set.

The initial value of eDRX is like as follows.

E-UTRAN (WB-S1 mode): eDRX – disabled, PTW(Paging Time Window) size - 4, cycle length - 1

CAT M1, GSM, UTRAN and E-UTRAN (NB-S1 mode): eDRX – disabled. PTW(Paging Time Window) size - 0, cycle length - 0

Not Subject to NDA

The **+CEDRXS** command is executed only when it has LTE radio technology.

AT+CEDRXS?

Read command returns the current settings for each defined value of **<AcTtype>**.

AT+CEDRXS=?

Test command returns the supported <mode>s and the value ranges for the access technology and the requested eDRX value as compound values. The **<Requested_eDRX_value>** can be indicated 4 bit binary number.

AT+CEDRXS=?

+CEDRXS: <mode>,<AcT-type>,<Requested_eDRX_value>

OK

```
AT+CEDRXS?
+CEDRXS: 4,"1111"

OK
AT+CEDRXS=?
+CEDRXS: (0-3),(4),("0000"-"1111")

OK
```


Not Subject to NDA

3.4.36. AT+CEDRXRDP - eDRX Read Dynamic Parameters

This command returns a message related to Extended Discontinuous Reception (eDRX).

3GPP TS 27.007
3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CEDRXRDP

Execution command returns the following message if eDRX is used for the cell that the MS is currently registered to, in the format:

+CEDRXRDP: <AcT-type>[,<Requested_eDRX_value>[,<NWprovided_eDRX_value>[,<Paging_time_window>]]]

If the cell that the MS is currently registered to is not using eDRX, **<AcTtype>=0** is returned.

Additional info:

- Here is the list of the meanings of the parameter returned by the **+CEDRXRDP** command.

Name	Type	Default	Description
<AcTtype>	integer	0	type of access technology. Values: 0 : access technology is not using eDRX

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			1 : CAT M1 2 : GSM (A/Gb mode) 3 : UTRAN (Iu mode) 4 : E-UTRAN (WB-S1 mode) 5 : E-UTRAN (NB-S1 mode)
<Requested_eDRX_value>	string	-	half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008, Table 10.5.5.32/3GPP TS 24.008.
<NW-provided_eDRX_value>	string	-	half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause

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			10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<Paging_time_window>	string	-	half a byte in a 4 bit format. The paging time window referes to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

If the NW do not support eDRX function, the **CEDRXRDP** execution command always returns "**0**".

Not Subject to NDA

The only "**4 - E-UTRAN (WB-S1 mode)**" of **<AcT-type>** could be supported.

The **CEDRXRDP** command is excuted only when it has LTE radio technology.

AT+CEDRXRDP=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.37. AT+CEREG - EPS Network Registration Status

This command monitors the Evolved Packet System (EPS) network registration status in LTE.

[1] 3GPP TS 24.008
[2] 3GPP TS 24.301
[3] 3GPP TS 25.331

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CEREG=[<mode>]

Set command enables/disables the EPS network registration unsolicited result code (URC) in LTE, and selects one of the available formats:

short format: **+CEREG: <stat>**
long format: **+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]**

<tac>, **<ci>**, and **<AcT>** are reported by the command only if available.

In case of error, possible response(s): **+CME ERROR: <err>**

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the network registration unsolicited result code (URC), and selects one of the available formats. The following events trigger the URC: URC short format is displayed every time there is a change in the EPS network registration status.

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URC long format is displayed every time there is a change of network cell in LTE.

Values:

0 : disable the network registration unsolicited result code

1 : enable the network registration unsolicited result code, and select the short format

2 : enable the network registration unsolicited result code, and selects the long format (includes the network cell identification data)

Unsolicited fields:

Name	Type	Description
<stat>	integer	EPS registration status Values: 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. Example, out of LTE coverage 5 : registered, roaming 6 : registered for "SMS only", home network (not applicable) 7 : registered for "SMS only", roaming (not applicable). 8 : attached for emergency bearer services only. 3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is

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		considered as attached for emergency bearer services. (not applicable). 9 : registered for "CSFB not preferred", home network (not applicable). 10 : registered for "CSFB not preferred", roaming (not applicable).
<tac>	string	tracking area code (two bytes) in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string	LTE cell ID (four bytes) in hexadecimal format
<AcT>	integer	indicates the access technology of the serving cell. Values: 0 : GSM (not applicable) 1 : GSM Compact (not applicable) 2 : UTRAN (not applicable) 3 : GSM w/EGPRS (see NOTE) (not applicable) 4 : UTRAN w/HSDPA (see NOTE) (not applicable) 5 : UTRAN w/HSUPA (see NOTE) (not applicable) 6 : UTRAN w/HSDPA and HSUPA (see NOTE) (not applicable) 7 : E-UTRAN

3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

Not Subject to NDA

AT+CEREG?

Read command returns the current value of <**mode**>, the registration status <**stat**>, and the information <**tac**>, <**ci**>, <**AcT**> according to the current <**mode**> parameter value.

+CEREG: <mode>,<stat>[,[<tac>],[<ci>],[<AcT>]]

<tac>, **<ci>** and **<AcT>** are reported only if **<mode>**=2 and the mobile is registered on some network cell.

AT+CEREG=?

Test command returns supported values for parameter <**mode**>.

Not Subject to NDA

3.4.38. AT#RFSTS - Read Current Network Status

Command reads current network status.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#RFSTS

Execution command returns the current network status. The format of the returned message is according to the network on which the module is registered.

GSM network

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

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

Not Subject to NDA

WCDMA network

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

Parameter	WCDMA Example	Description
PLMN	"450 05"	Country code and operator code (MCC, MNC)
UARFCN	10737	UMTS Assigned Radio Channel
PSC	75	Active PSC (Primary Synchronization Code)
Ec/Io	-7.0	Active Ec/Io (chip energy per total wideband power in dBm)
RSCP	-74	Active RSCP (Received Signal Code Power in dBm)
RSSI	-67	Received Signal Strength Indication
LAC	2011	Localization Area Code
RAC	11	Routing Area Code
TXPWR	1	Tx Power (In traffic only)
DRX	64	Discontinuous reception cycle Length (cycle length : display using ms)
MM	19	Mobility Management
RRC	0	Radio Resource Control
NOM	1	Network Operator Mode
BLER	005	Block Error Rate (005 means 0.5 %)
CID	2B1C05	Cell ID (IN HEX)
IMSI	"450050203619261"	International Mobile Station ID
NetNameAsc	"SKTelecom"	Operation Name, Quoted string type or “” if network name is unknown
SD	3	Service Domain (0: No Service, 1 : CS only, 2 : PS only, 3 :

Not Subject to NDA

		CS+PS, 4 : Camped)
CsAccess	3	Circuit Switch Access (0: Normal calls only, 1: Emergency calls only, 2: No calls, 3: All calls)
PsAccess	3	Packet Switch Access (0: Normal calls only, 1: Emergency calls only, 2: No calls, 3: All calls)
nAST	3	Number of Active Set (Maximum 6)
nUARFCN		UARFCN of n-th active set
nPSC		PSC of n-th active set
nEc/Io		Ec/Io of n-th active Set
ABND	0	Active Band (1: 2100 MHz, 2: 1900 MHz, 3: 850 MHz, 4: 900 MHz, 5: 1700 MHz, 6: 800 MHz, 7: 1800 MHz)

LTE network

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

Parameter	LTE Example	Description

Not Subject to NDA

PLMN	"262 25"	Country code and operator code (MCC, MNC)
EARFCN	6400	E-UTRA Assigned Radio Channel
RSRP	-99	Reference Signal Received Power
RSSI	-76	Received Signal Strength Indication
RSRQ	-7	Reference Signal Received Quality
TAC	40A5	Tracking Area Code
TXPWR	0	Tx Power (In traffic only)
DRX	64	Discontinuous reception cycle Length(cycle length : display using ms)
MM	19	Mobility Management
RRC	0	Radio Resource Control
CID	0000007	Cell ID
IMSI	"262011242110776"	International Mobile Station ID
NetNameAsc	"Telekom.de"	Operation Name, quoted string type or "" if network name is unknown
SD	3	Service Domain (0: No Service, 1: CS only, 2: PS only, 3: CS+PS, 4: Camped)
ABND	20	Active Band (1..63) 3GPP TS 36.101
SINR	93	Signal-to-Interface plus Noise Ratio (range 0 - 250)

nSAT - Number of active set, Maximum is 6.

If nSAT value is 1, it means that active set number 1. Module does not display after parameters of nSAT.

TXPWR of GSM network means 1 tx burst

MM - Mobility Management States are:

0 - NULL

3 - LOCATION_UPDATE_INITIATED

5 - WAIT_FOR_OUTGOING_MM_CONNECTION

6 - CONNECTION_ACTIVE

7 - IMSI_DETACH_INITIATED

8 - PROCESS_CM_SERVICE_PROMPT

Not Subject to NDA

9 - WAIT_FOR_NETWORK_COMMAND

10 - LOCATION_UPDATE_REJECTED

13 - WAIT_FOR_RR_CONNECTION_LU

14 - WAIT_FOR_RR_CONNECTION_MM

15 - WAIT_FOR_RR_CONNECTION_IMSI_DETACH

17 - REESTABLISHMENT_INITIATED

18 - WAIT_FOR_RR_ACTIVE

19 - IDLE

20 - WAIT_FOR_ADDITIONAL_OUTGOING_MM_CONNECTION

21 - WAIT_FOR_RR_CONNECTION_REESTABLISHMENT

22 - WAIT_FOR_REESTABLISH_DECISION

23 - LOCATION_UPDATING_PENDING

25 - CONNECTION_RELEASE_NOT_ALLOWED

MM (LTE) - Mobility Management States are:

0 - NULL

1 - DEREGISTERED

2 - REGISTERED_INITIATED

3 - REGISTERED

4 - TRACKING_AREA_UPDATING_INITIATED

5 - SERVICE_REQUEST_INITIATED

6 - DEREGISTERED_INITIATED

7- INVALID_STATE

RR - Radio Resource States are:

0 - INACTIVE

1 - GOING_ACTIVE

2 - GOING_INACTIVE

3 - CELL_SELECTION

4 - PLMN_LIST_SEARCH

5 - IDLE

Not Subject to NDA

6 - CELL_RESELECTION
7 - CONNECTION_PENDING
8 - CELL_REESTABLISH
9 - DATA_TRANSFER
10 - NO_CHANNELS
11 - CONNECTION_RELEASE
12 - EARLY_CAMPED_WAIT_FOR_SI
13 - W2G_INTERRAT_HANDOVER_PROGRESS
14 - W2G_INTERRAT_RESELECTION_PROGRESS
15 - W2G_INTERRAT_CC_ORDER_PROGRESS
16 - G2W_INTERRAT_RESELECTION_PROGRESS
17 - WAIT_FOR_EARLY_PSCAN
18 - GRR
19 - G2W_INTERRAT_HANDOVER_PROGRESS
21 - W2G_SERVICE_REDIRECTION_IN_PROGRESS
22 - RESET
29 - FEMTO
30 - X2G_RESEL
31 - X2G_RESEL_ABORTED
32 - X2G_REDIR
33 - G2X_REDIR
34 - X2G_CGI
35 - X2G_CCO_FAILED
36 - X2G_CCO_ABORTED
37 - X2G_CCO_FAILED_ABORTED
38 - RR_INVALID

RRC (WCDMA) - Radio Resource Control States are:
0 - RRC_STATE_DISCONNECTED
1 - RRC_STATE_CONNECTING

Not Subject to NDA

2 - RRC_STATE_CELL_FACH

3 - RRC_STATE_CELL_DCH

4 - RRC_STATE_CELL_PCH

5 - RRC_STATE_URA_PCH

6 - RRC_STATE_WILDCARD

7 - RRC_INVALID

RRC (LTE) - Radio Resource Control States are:

0 - RRC_IDLE

1 - RRC_CONNECTED

AT#RFSTS=?

Test command returns **OK** result code.

Not Subject to NDA

3.4.39. AT#SPN - Read SIM Field SPN

This command reads SIM fields SPN.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SPN

Execution command returns the service provider string contained in the SIM field SPN, in the format:

#SPN: <spn>

Unsolicited field:

Name	Type	Description
<spn>	string	service provider string contained in the SIM field SPN, represented in the currently selected character set, see **+CSCS**.

If the SIM field SPN is empty, the command returns the **OK** result code.

AT#SPN=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.40. AT#CHBHCID - Change Context ID

This command is used to change CID (Context ID) of backhaul connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#CHBHCID=<IPFamily>,<CID>

Set command used to change CID (Context ID) for a backhaul (internal application processor data interface) connection.

Parameters:

Name	Type	Default	Description
<IPFamily>	integer Values: 4 : IPV4 6 : IPV6	N/A	**4 is IPV4, 6 is IPV6**
<CID>	integer Value: 1÷24 : range [1 - 24]	N/A	**Context ID**

This command just change CID without establishing backhaul connection.

AT#CHBHCID?

Get current backhaul's CID for each IPV4 and IPV6

Not Subject to NDA

Ex)

AT#CHBHCID?

#CHBHCID: 10,20

OK

AT#CHBHCID=?

Show usage

at#chbhcid=?

#chbhcid: (4,6),(1-24)

Not Subject to NDA

3.4.41. AT#LTEULOOS - Enable or Disable for reporting EVENT_LTE_UL_OUT_OF_SYNC event

This command is enabled or disabled for reporting EVENT_LTE_UL_OUT_OF_SYNC event.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#LTEULOOS=<mode>

Set command enables/disables EVENT_LTE_UL_OUT_OF_SYNC event reports depending on the parameter <**mode**>.

The module will displays URC when it happens "EVENT_LTE_UL_OUT_OF_SYNC" event if the <mode> is 1.

#LTEULOOS: REPORT LTE_UL_OUT_OF_SYNC

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Reporting EVENT_LTE_UL_OUT_OF_SYNC event. Values: 0 : Disable to report "EVENT_LTE_UL_OUT_OF_SYNC" 1 : Enable to report "EVENT_LTE_UL_OUT_OF_SYNC"

The setting is saved in NVM

AT#LTEULOOS?

Read command reports the currently selected <mode> in the format:

Not Subject to NDA

#LTEULOOS: <mode>

AT#LTEULOOS=?

Test command reports the supported range of values.

Not Subject to NDA

3.4.42. AT#ALLOWHAC - Allow Network Access with high Access Class only

This command is enabled or disabled to control High-Access-class-only modules to camp onto the network.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ALLOWHAC=<mode>

Set command enables or disables to control High-Access-class-only modules to camp onto the network.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Defines to control Camp on to the network without Low-Access-Classes

Values:

0 : Disable to camp on to the network without Low-Access-Classes

1 : Enable to camp on to the network without Low-Access-Classes

This setting value is saved in NVM.

It is recommended performing a reboot the module after every #ALLOWHAC setting.

AT#ALLOWHAC?

Read command returns the current value of parameter **<mode>**.

Not Subject to NDA

#ALLOWHAC: <mode>

AT#ALLOWHAC=?

Test command returns all supported values of the parameter **<mode>**.

There is a possibility that this may cause GCF failures in the existing GCT test cases.

There is a possibility that any new GCF test cases could fail.

There is a possibility that some carriers do not want UE to camp onto the network when only High Access class is enabled in the SIM.

Therefore, this function should not be activated without the network provider and customer approval.

Not Subject to NDA

3.4.43. AT#MONI - Cell Monitor

This command is both a set and an execution command.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MONI[=[<number>]]

Set command sets one cell out of seven, in a neighbor list of the serving cell including it, from which extract GSM/LTE related information.

After entering the set command, enter the execution command **AT#MONI**<CR> to get the GSM/LTE related information for the selected cell and dedicated channel (if exists) in the format shown, for each network, in the Additional info section.

Parameter:

Name	Type	Default	Description
<number>	integer	-	the parameter meaning depends on the network, see Additional info section.

Additional info:

- GSM network

Name	Type	Default	Description
<number>	integer	0	GSM network

Values:

0÷6 : it is the ordinal number of the cell, in the neighbor list of the serving cell.

Not Subject to NDA

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

▶▶ LTE network

Name	Type	Default	Description
<number>	integer	0	LTE network

Values:

0 : it is the serving cell

1 : it is the intra-frequency cells

2 : it is the inter-frequency cells

3 : it is the W-CDMA neighbor cells, the report message is empty.

4 : it is the GSM neighbor cells

5,6 : it is not available

7 : it is a special request to obtain LTE-related information from the all available neighbor cells.

▶▶ Execution command **AT#MONI**<CR> reports GSM/LTE related information for selected cell and dedicated channel (if exists) in the following formats:

a) When extracting data for the serving cell and the network name is known the format is:

GSM network

Not Subject to NDA

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

LTE network

#MONI: <netmame> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm> DRX:<drx> pci:<physicalCellId> QRxLevMin:<QRxLevMin>

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>

LTE network

#MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm> DRX:<drx> pci:<physicalCellId> QRxLevMin:<QRxLevMin>

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

GSM network

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

LTE network

LTE intra-frequency and inter-frequency cells

#MONI: RSRP:<rsrp> RSRQ:<rsrq> PhysCellId:<physicalCellId> EARFCN:<earfcn> PWR:<dBm>

LTE GSM neighbor cells

Not Subject to NDA

#MONI: Adj Cell<n> BSIC:<bsic> ARFCN:<arfcn> PWR:<dBm>

Name	Type	Default	Description
<netname>	string	-	name of network operator
<cc>	string	-	country code
<nc>	string	-	network operator code
<n>	integer	-	progressive number of adjacent cell
<bsic>	string	-	base station identification code
<qual>	integer	-	quality of reception: 0..7
<lac>	string	-	localization area code
<id>	integer	-	cell identifier
<arfcn>	integer	-	assigned radio channel
<dBm>	integer	-	received signal strength in dBm.
<timadv>	integer	-	timing advance
<rscp>	integer	-	Received Signal Code Power in dBm.
<drx>	string	-	Discontinuous reception cycle length
<physicalCellId>	integer	-	physical cell identifier
<rsrp>	integer	-	Reference Signal Received Power

Not Subject to NDA

<rsrq>	integer	-	Reference Signal Received Quality
<tac>	integer	-	Tracking Area Code
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<QRxLevMin>	integer	-	minimum required RX level in the cell

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

When **AT#MONI=7** is the last setting entered, the execution command **AT#MONI<CR>** reports the information previously listed for each of the cells in the neighbor of the serving cell. The information is formatting in a sequence of <CR><LF>-terminated strings.

The timing advance value is meaningful only during calls or GPRS transfers active.

AT#MONI=?

Test command reports the maximum number of cells, in a neighbor of the serving cell excluding it, from which we can extract GSM/LTE related information, along with the ordinal number of the current selected cell, in the format:

#MONI: (<MaxCellNo>,<CellSet>)

Additional info:

- Parameters meaning.

Not Subject to NDA

Name	Type	Default	Description
<MaxCellNo>	integer	-	maximum number of cells in a neighbor of the serving cell and excluding it from which we can extract GSM/LTE related information. This value is always 6.
<CellSet>	integer	-	last setting done with command #MONI.

Not Subject to NDA

The module supports GSM network

```
AT+WS46?
+WS46: 30
OK

AT+CREG?
+CREG: 0,1
OK

AT#MONI=1
OK

AT#MONI=?
#MONI: (6,1)
OK

AT#MONI
#MONI: I TIM BSIC:25 RxQual:0 LAC:D5BD Id:3A27 ARFCN:1018 PWR:-
72dbm TA:-1
OK

AT#MONI=7
OK

AT#MONI=?
#MONI: (6,7)
OK

AT#MONI

#MONI:
Cell  BSIC  LAC   CellId  ARFCN   Power    C1  C2  TA  RxQual  PLMN
#MONI: S    25   D5BD   3A27   1018   -74dbm    31  31   4    7       I TIM
#MONI: N1   26   D5BD   3A26   1023   -79dbm    -1  -1
#MONI: N2   21   D5BD   5265   1009   -78dbm    -1  -1
#MONI: N3   27   D5BD   5266    13    -87dbm    -1  -1
#MONI: N4   25   D5BD   5251   1020   -88dbm    -1  -1
#MONI: N5   27   D5BD   5286   1011   -95dbm    -1  -1
#MONI: N6   30   00D2   C5A0    16    -99dbm    -1  -1

OK
```


Not Subject to NDA

3.4.44. AT#BRCSFB - Blind G2L redirection after CSFB

This command enables/disables blind GSM to LTE redirection after CS fallback Parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#BRCSFB=<par>

This command enables/disables blind GSM to LTE redirection after CS fallback Parameters.

Parameter:

Name	Type	Default	Description
<par>	integer	0	

Values:

0 : Disable blind G2L redirection after CSFB (default value)

1 : Enable blind G2L redirection after CSFB

Value saved in NVM.

Requires reboot after set command.

The LE910Cx-EU variants has default value 1.

AT#BRCSFB?

The read command reports current state of blind G2L redirection after CSFB.

Additional info:

Not Subject to NDA

▶▶ #BRCSFB: <state>

Name	Type	Default	Description
<state>	integer	-	current state of blind G2L redirection after CSFB

AT#BRCSFB=?

Test command reports the supported range of values for parameter <par>.

Not Subject to NDA

3.4.45. AT#SELBNDMODE - Select Band configuration mode

This command selects band configuration mode

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SELBNDMODE=[<mode>]

Set command configures the mode of band set between **#BND** and **#BNDRAM.**

Parameter:

Name	Type	Default	Description
<mode>	integer	0	band configuration mode

Values:

0 : It makes to enable the #BND set cmd and disable the #BNDRAM's

1 : It makes to enable the #BNDRAM set cmd and disable the #BND's

AT#SELBNDMODE?

Read command reports the band configuration mode in the format:

#SELBNDMODE: <mode>

AT#SELBNDMODE=?

Test command reports the supported values for the parameter **<mode>.**

Not Subject to NDA

3.4.46. AT#MANAGEROAM - Managed Roam feature

This command sets the Managed Roam feature.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#MANAGEROAM=<mgrf>,<auto_reject>

Set command enables/disables specific features.

Parameters:

Name	Type	Default	Description
<mgrf>	integer	0	Managed Roaming Feature Values: 0 : Disable Manage Roam 1 : Enable Manage Roam
<auto_reject>	string	0	With 4 rejects on LU registration, move to Automatic network selection Values: 0 : Disable automatic network selection 1 : Enable automatic network selection

After setting this command, need to reset using #REBOOT or HW reset

The <mgrf> default value for the following operators is '1'.

- LE910Cx-AP KDDI/TELSTRA/VNZ
- LE910Cx-EU
- LE910Cx-NF VZW
- LE910C1-SV

Not Subject to NDA

- LE910C1-EUX/SVX
- LE910Cx-WWX BELL/TELUS/VZW

AT#MANAGEROAM?

Read command returns the current parameter value.

AT#MANAGEROAM=?

Test command returns the range of supported parameters.

Not Subject to NDA

3.4.47. AT#GTUNEANT - Get Tunable Anternna Interface

This command is get for Tunable Antenna Interface.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#GTUNEANT?

Read command for Tunable Antenna Interface.

Specific GPIO pin is available on the host interface that can be connected to an external antenna switch.

Additional info:

Get the Tunable Antenna Interface.

<band_mask>,<ant1_cfg>[,<ant2_cfg>]

Name	Type	Default	Description
<band_mask>	hex	-	
<ant1_cfg>	string	-	
<ant2_cfg>	string	-	

This command value is returned when **AT#STUNEANT** value "1".

Not Subject to NDA

#1 Gpio used and supported band is lte:2,4,5,12,13,14,66,71 wcdma:2,4,5, so All mask value is D6071A for LE910Cx-NF.

AT#GPIO=2,0,17

AT#STUNEANT=1,2,1 ->GPIO2 high set for LTE BAND2

AT#GTUNEANT?

#GTUNEANT: 2,1

#GTUNEANT: D60718,0 ->GPIO2 low set except LTE BAND2

(LTE 4,5,12,13,14,66,71 / WCDMA:2,4,5)

#2 Gpio used and supported band is lte:2,4,5,12,13,14,66,71 wcdma:2,4,5, so All mask value is D6071A for LE910Cx-NF.

AT#GPIO=2,0,17

AT#GPIO=3,0,18

AT#STUNEANT=1,2,1,1 -> gpio set for LTE BAND2

AT#STUNEANT=1,8,1,0 -> gpio set for LTE BAND4

AT#STUNEANT=1,10,0,1 -> gpio set for LTE BAND5

AT#STUNEANT=1,D60700,0,0 -> (LTE 12,13,14,66,71 / WCDMA 2,4,5)

AT#GTUNEANT?

#GTUNEANT: 2,1,1

#GTUNEANT: 8,1,0

#GTUNEANT: 10,0,1

#GTUNEANT: D60700,0,0

Not Subject to NDA

3.4.48. AT#SDOMAIN - Supplementary service domain preference

This command allows to selects service domain preference.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SDOMAIN=[<Sdomain>],[<USdomain>]

Set command allows to selects service domain preference.

Parameters:

Name	Type	Default	Description
<Sdomain>	integer	3	supplementary service domain preference Values: 0 : Domain preference is auto 1 : Domain preference is CS only 2 : Domain preference is PS only 3 : Domain preference is PS preferred
<USdomain>	integer	N/A	Unstructured supplementary service domain preference Values: 0 : Domain preference is CS only 1 : Domain preference is IMS preferred

Need to power cycle the unit for the setting to take effect.

the mode is saved into the NVM

Not Subject to NDA

For AT&T/Softbank/KDDI variants, the default value is 2. (except for LE910C1-SA)

AT#SDOMAIN?

Read command returns the current value of parameters

AT#SDOMAIN=?

Test command returns all supported values of the parameters

Not Subject to NDA

3.4.49. AT#NWSCANTMR - Network Scan Timer

This command sets the Network Scan Timer.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#NWSCANTMR=<tmr>

Set command sets the Network Scan Timer that is used by the module to schedule the next network search when it is without network coverage (no signal).

Parameter:

Name	Type	Default	Description
<tmr>	integer	5	timer value in units of seconds Value: 5÷3600 : time in seconds

Additional info:

- Execution command reports time, in seconds, when the next scan activity will be executed. The format is:

  #NWSCANTMREXP: <time>

Name	Type	Default	Description
<time>	integer	-	Remained time of **<tmr>**. if **<time>** is zero it means that the timer is not running.

Not Subject to NDA

AT#NWSCANTMR?

Read command reports the current parameter setting in the format:

#NWSCANTMR: <tmr>

AT#NWSCANTMR=?

Test command reports the supported range of values

How much time it takes to execute the network scan depends either on how much bands have been selected and on network configuration (mean value is 5 seconds)

Not Subject to NDA

3.4.50. AT#NASC - Non-Access-Stratum compliancy

This command allows to selects NAS compliancy.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#NASC=[<mode>]

Set command allows to selects NAS compliancy.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	NAS specification-compliant

Values:

0 : Forces UE to be Release 99 NAS specification - compliancy.

1 : Forces UE to be Release 5 NAS specification - compliancy.

2 : Forces UE to be Release 6 NAS specification - compliancy.

3 : Forces NAS to comply with 3GPP Release 7.

4 : Forces NAS to comply with 3GPP Release 10.

5 : Forces NAS to comply with 3GPP Release 11.

Need to power cycle the unit for the setting to take effect.

The mode is saved into the NVM.

Not Subject to NDA

Default value of <mode> for TMO firmwares(ST, NF-TMO) are configured to '3' and for NTT firmwares are configured to '5' and for KDDI firmwares are not configured and for the others are '2'.

AT#NASC?

Read command returns the current value of parameter **<mode>**.

AT#NASC=?

Test command returns all supported values of the parameter **<mode>**.

Not Subject to NDA

3.4.51. AT+CDIP - Called line identification presentation

This command enables/disables the presentation of the CLI at the TE.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CDIP=[<n>]

Set command enables/disables the presentation of the CLI (called line identifications) at the TE.

This command related to a network service that provides "multiple called numbers (called line identifications) service" to an MT. This command enables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call.

When the presentation of the called line identification at the TE is enabled, the below URC is returned after every **RING** (or **+CRING: <type>**; refer subclause "Cellular result codes +CRC") result code sent from TA to TE. It is manufacturer specific if this response used when normal voice call answered.

+CDIP:<number>,<type>[,<subaddr>,<satype>]

Parameter:

Name	Type	Default	Description
<n>	string	N/A	parameter sets/shows the result code presentation status to the TE Values: 0 : disable 1 : enable

Unsolicited fields:

Not Subject to NDA

Name	Type	Description
<number>	string	phone number of format specified by **<type>**
<type>	string	type of address octet in integer format (refer 3GPP TS 24.008 subclause 10.5.4.7)
<subaddr>	string	string type subaddress of format specified by **<satype>**
<satype>	string	type of subaddress octet in integer format (refer 3GPP TS 24.008 subclause 10.5.4.8)

AT+CDIP?

Read command gives the status of **<n>** and also triggers an interrogation of the provision status of the "multiple called numbers" service.

+CDIP: <n>,<m>

Additional info:

▸▸ where

Name	Type	Default	Description
<n>	integer	N/A	parameter sets/shows the result code presentation status to the TE Values: 0 : disable 1 : enable
<m>	integer	0	parameter shows the subscriber "multiple called numbers" service status in the network Values:

Not Subject to NDA

0 : "multiple called numbers service" is not provisioned

1 : "multiple called numbers service" is provisioned

2 : unknown (e.g. no network, etc.)

AT+CDIP=?

Test command returns the range for the parameter **<n>**.

Not Subject to NDA

3.4.52. AT+CLIP - Calling Line Identification Presentation

This command enables/disables the presentation of the CLI (Calling Line Identity).

3GPP TS 27.007
3GPP TS 22.081

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CLIP=[<enable>]

Set command refers to the supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. If enabled the device reports after each **RING** the response:

+CLIP: <number>,<type>,"",128,<alpha>,<CLI_validity>

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enables/disables CLI indication. The command changes only the report behavior of the device, it does not change CLI supplementary service setting on the network.

Values:

0 : disable

1 : enable

Unsolicited fields:

Not Subject to NDA

Name	Type	Description
<number>	string	phone number of format specified by <**type**>
<type>	integer	type of address octet Values: 128 : both the type of number and the numbering plan are unknown 129 : unknown type of number and ISDN/Telephony numbering plan 145 : international type of number and ISDN/Telephony numbering plan (contains the character "+") 161 : national type of number and ISDN/Telephony numbering plan
<alpha>	string	alphanumeric representation of <**number**> corresponding to the entry found in phonebook; used character set should be the one selected with command **+CSCS**
<CLI_validity>	integer	validity of CLIP Values: 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

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).

Not Subject to NDA

AT+CLIP?

Read command returns the presentation status of the CLI in the format:

+CLIP: <enable>,<status>

Additional info:

Parameters:

Name	Type	Default	Description
<enable>	integer	N/A	status of the local setting Values: 0 : CLI presentation disabled 1 : CLI presentation enabled
<status>	integer	N/A	status of the CLIP service on the network Values: 0 : CLIP not provisioned 1 : CLIP provisioned 2 : unknown (e.g. no network is present)

Read 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 <**enable**>.

Not Subject to NDA

3.4.53. AT+COLR - Connected Line Identification Restriction status

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

3GPP TS 22.081

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+COLR

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 to standard. The command returns the COLR service status in the format:

+COLR: <m>

The <**m**> parameter is described in Additional info section.

Additional info:

- Here is the meaning of the <**m**> parameter returned by the command.

Name	Type	Default	Description
<m>	integer	0	subscriber COLR service status.

Not Subject to NDA

Values:

0 : COLR not provisioned

1 : COLR provisioned

2 : unknown (example: no network, etc.)

Activation, deactivation, registration and erasure of the supplementary service COLR are not applicable.

AT+COLR=?

Test command tests for command existence

Not Subject to NDA

3.4.54. AT+CCFC - Call Forwarding Number And Condition

This command controls the call forwarding supplementary service.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CCFC=<reason>,<cmd>[,<number>[,<type>[,<class>[,<time>]]]]

The execution command controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Parameters:

Name	Type	Default	Description
<reason>	integer	0	reason of call forwarding
	Values:		
	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>	integer	0	command parameter
	Values:		
	0 : disable		

Not Subject to NDA

1 : enable

2 : query status

3 : registration

4 : erasure

<number>	string	-	string type phone number of forwarding address in format specified by <**type**> parameter
<type>	integer	129	type of address octet in integer format Values: 129 : National numbering scheme 145 : International numbering scheme (contains the character "+")
<class>	integer	7	sum of integers each representing a class of information which the command refers to; default 7 (voice + data + fax) 27. **1** voice(telephony) 28. **2** data 29. **4** fax (facsimile services) (not supported by LTE) 30. **8** short message service 31. **16** data circuit sync 32. **32** data circuit async 33. **64** dedicated packet access 34. **128** dedicated PAD access Value: 0÷255 : class of information
<time>	integer	20	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) Value:

Not Subject to NDA

1÷30 : automatically rounded to a multiple of 5 seconds

Additional info:

- when <cmd>=2 and command successful, it returns:

  +CCFC: <status>,<class$_1$>[,<number>,<type>[,,,<time>]][<CR><LF>
  +CCFC: <status>,<class$_2$>[,<number>,<type>[,,,<time>]][...]]

Name	Type	Default	Description
<status>	integer	0	status of the network service
	Values:		
	0 : not active		
	1 : active		
<time>	string	-	it is returned only when <reason>=2 ("no reply") and <cmd>=2.

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>.

AT+CCFC=?

Test command reports supported values for the parameter <reason>.

Not Subject to NDA

AT+CCFC=0,2 - To check if the unconditional call forwarding is on or off.

AT+CCFC=0,3,"Nunber" - To register the unconditional call forwarding to the network.

AT+CCFC=0,1,"Nunber" - To activate the unconditional call forwarding.

AT+CCFC=0,0 - To deactivate the unconditional call forwarding.

AT+CCFC=0,3,"+972575684414" - For registration

AT+CCFC=0,1,"+ 972575684414" - For activation

Not Subject to NDA

3.4.55. AT+CCWA - Call Waiting

This command allows control of the supplementary service Call Waiting. Activation, deactivation and status query are supported.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CCWA=[<n>[,<cmd>[,<class>]]]

Set command allows to enable/disable of the presentation of the URC to the TE when call waiting service is enabled; it also permits to activate, deactivate and query the status of the call waiting service.

The URC has the following format:

+CCWA: <number>,<type>,<class>[,<alpha>][,<cli_validity>]

Parameters:

Name	Type	Default	Description
<n>	integer	0	Enables/disables the presentation of an unsolicited result code Values: 0 : disable 1 : enable
<cmd>	integer	0	Enables/disables or queries the service at network level Values:

Not Subject to NDA

0 : disable

1 : enable

2 : query status

<class>	integer	7	sum of integers each representing a class of information which the command refers to; default is 7 (voice + data + fax) 35. **1** voice(telephony) 36. **2** data 37. **4** fax (facsimile services) (not supported by LTE) 38. **8** short message service 39. **16** data circuit sync 40. **32** data circuit async 41. **64** dedicated packet access 42. **128** dedicated PAD access

Value:

1÷255 : class of information

Unsolicited fields:

Name	Type	Description
<number>	string	Phone number of calling address in format specified by <type>
<type>	integer	Type of address in integer format Values: 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 "+")

Not Subject to NDA

		161 : National type of number and ISDN/Telephony numbering plan
<class>	integer	See before
<alpha>	string	Alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with **+CSCS**.
<cli_validity>	integer	This parameter can provide details why **<number>** does not contain a calling party BCD number. Values: 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

The response to the query command is in the format:

+CCWA: <status>,<class$_1$>[<CR><LF>
+CCWA: <status>,<class$_2$>[...]]

where

<status> represents the status of the service:
0 - inactive
1 - active

<class$_n$> - same as **<class>**

If parameter **<cmd>** is omitted then network is not interrogated.

Not Subject to NDA

In the query command the class parameter must not be issued.

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 modem; 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 second case, while in the first case a ringing indication is sent to the third party.

The command **AT+CCWA=1,0** has no effect and is a non sense, then must not be issued.

AT+CCWA?

Read command reports the current value of the parameter **<n>** in the format

+CCWA: <n>

AT+CCWA=?

Test command reports the supported values for the parameter **<n>**.

Not Subject to NDA

3.4.56. AT+VZWRSRP - Read RSRP Values

Additional Verizon Wireless specific AT command used for certification tests.

LTE AT commands for Test automation REQ_FEB2014

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+VZWRSRP?

Read command reports the **RSRP** info in the format:

+VZWRSRP:<cellID1>,<EARFCN1>,<RSRP1>[,<cellID2>,<EARFCN2>,<RSRP2>[,...[,<cellIDn>,<EARFCNn>,<RSRPn>]]]

Additional info:

Here are the parameters meaning:

Name	Type	Default	Description
<cellIDx>	integer	-	physical cell id (3 digits)
<EARFCNx>	integer	-	EARFCN for the given cell
<RSRPx>	integer	-	RSRP value in dBm/15kHz

AT+VZWRSRP=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.57. AT+VZWRSRQ - Read RSRQ Values

Additional Verizon Wireless specific AT command used for certification tests.

LTE AT commands for Test automation REQ_FEB2014

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+VZWRSRQ?

Read command reports the **RSRQ** info in the format:

+VZWRSRQ:<cellID1>,<EARFCN1>,<RSRQ1>[,<cellID2>,<EARFCN2>,<RSRQ2>[,...[,<cellIDn>,<EARFCNn>,<RSRQn>]]]

Additional info:

Here are the parameters meaning:

Name	Type	Default	Description
<cellIDx>	string	-	physical cell id (3 digits)
<EARFCNx>	integer	-	EARFCN for the given cell
<RSRQx>	string	-	RSRQ value

AT+VZWRSRQ=?

Test command returns the **OK** result code.

Not Subject to NDA

3.4.58. AT+COPS - Operator Selection

The command selects a network operator and registers the module.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	Yes	-	2

AT+COPS=[<mode>[,<format>[,<oper>[,<act>]]]]

The set command attempts to select a network operator and registers the module on the just chosen operator; the selection can be automatic or manual.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	defines the operator selection: automatic or manual. Values: 0 : automatic selection, the parameter <oper> is ignored 1 : manual selection, the parameter <oper> must be present 2 : deregister from network. The module is unregistered until a +COPS with <mode>=0, 1 or 4 is issued 3 : set only <format> parameter, the parameter <oper> is ignored 4 : manual/automatic, <oper> parameter must be present. If manual selection fails, the module will tray automatic mode (<mode>=0)

Not Subject to NDA

	5 : Unknown		
<format>	integer	0	specifies the operator name format, see <**oper**> parameter Values: 0 : alphanumeric long form (max length 16 digits) 1 : alphanumeric short form 2 : numeric 5 or 6 digits [country code (3) + network code (2 or 3)]
<oper>	mixed	-	network operator in format defined by <**format**> parameter. String type <format> indicates if the format is alphanumeric or numeric. long alphanumeric format can be up to 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]). numeric format is the GSM Location Area Identification number (refer 3GPP TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific. Returned <oper> shall not be in BCD format, but in IRA characters converted from BCD. Hence, the number has the structure: (country code digit 3) (country code digit 2) (country code digit1) (network code digit 3) (network code digit 2) (network code digit 1).
<act>	integer	N/A	selects access technology. Values: 0 : GSM 2 : UTRAN

Not Subject to NDA

<mode> parameter setting is stored in NVM and available at next reboot. <mode>=3 is not saved.

If <mode>=1 or 4, the selected network is stored in NVM too and is available at the next reboot (this will happen also after inserting another SIM).

<mode>=5 is a value of 'read command' and not of 'set command'. This is a transient state that occurs while a modem is initialized.

The network name can only be used among the list of network names displayed by the +COPN command when using the manual choice mode with alphanumeric format.

<format> parameter setting is never stored in NVM.

If AT+COPS=0 is issued after the switch-on, it causes a new attempt to select a network operator and registers the module on the selected operator.

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>]

If the module is deregistered, <format>, <oper>, and <act> parameters are omitted.

A network name can be displayed with different name from showed network name list by the +COPN command if the UE could get a camped network name from USIM or network.

Not Subject to NDA

AT+COPS=?

Test command returns a list of quadruplets, each representing an operator present in the network. The quadruplets list is ended with the range values of the <**mode**> and <**formats**> parameters.

The quadruplets in the list are closed between round brackets, separated by commas, the <**oper**> parameter is returned in both formats.

+COPS: [quadruplets list **(<stat>,<oper** (in <format>=0)**>,,<oper** (in <format>=2)**>,< act>),**
(<stat>,<oper (in <format>=0)**>,,<oper** (in <format>=2)**>,< act>), ...]**
[,,(range of **<mode>),(**range of **<format>)]**

<**stat**> parameter is described in the Additional info section.

Additional info:

Meaning of the <**stat**> parameter.

Name	Type	Default	Description
<stat>	integer	N/A	operator availability
	Values: 0 : unknown 1 : available 2 : current 3 : forbidden		

Since with this command a network scan is done, this command may require some seconds before the output is given.

Not Subject to NDA

3.4.59. AT#REJER - Network Reject Error Report

The command is related to a numeric error report that comes from the network.

It is described the meaning of the <reject_cause> numeric value that comes from MM, GMM, and EMM.

- 3GPP TS 24.008 Annex G.

  3GPP TS 24.301 Annex A.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#REJER=<mode>

Set command controls the presentation of an unsolicited result code

#REJER: <reject_cause>,<AcT>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the network reject unsolicited result code. Values: 0 : disable the network reject unsolicited result code 1 : enable the network reject unsolicited result code

Unsolicited fields:

Name	Type	Description

Not Subject to NDA

<reject_cause>	integer	Indicates that <reject_cause> contains an MM/GMM/EMM cause value, see 3GPP TS 24.008 Annex G and TS 24.301 Annex A.
<AcT>	string	Access Technology of the rejected network Values: GSM : GSM/GSM Compact/EGPRS WCDMA : UTRAN/HSDPA/HSUPA LTE : E-UTRAN

AT#REJER?

Read command returns the current value of **<mode>**, the reject cause value **<reject_cause>** and the rejected network technology**<AcT>**.

#REJER: <mode>,<reject_cause>,<AcT>

AT#REJER=?

Test command returns supported values for parameter <**mode**>.

#REJER: 1,11,LTE

Not Subject to NDA

3.4.60. AT#LTESFN - Read LTE system and subframe number

This command can report the current LTE system frame number sub frame number.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#LTESFN[=[<sysFrameNumber>[,<subFrameNumber>]]]

Read command reports the current LTE system frame number **<sysFrameNumber>** and sub frame number **<subFrameNumber>** in the format:

#LTESFN: <sysFrameNumber>,<subFrameNumber>

Parameters:

Name	Type	Default	Description
<sysFrameNumber>	integer	N/A	system frame number
	Value:		
	0÷1023 : system frame number value		
<subFrameNumber>	integer	N/A	subframe number
	Value:		
	0÷9 : subframe number value		

The **<sysFrameNumber>** and **<subFrameNumber>** can be reported when module has LTE system. In other words, if LTE is not acquired, the ERROR is returned. The **<sysFrameNumber>** and **<subFrameNumber>** values are returned until the LTE RAT is completely changed to no-service or another RAT.

AT#LTESFN?

Not Subject to NDA

Read command operates as execution command.

This command type needs for backward compatibility.

AT#LTESFN=?

Test command returns **OK** result code.

```
AT#LTESFN=?
OK
AT#LTESFN
#LTESFN: 263,3
OK
AT#LTESFN?
#LTESFN: 455,3
 OK
```


Not Subject to NDA

3.4.61. AT#CIPHIND - Ciphering Indication

This command enables/disables unsolicited result code for cipher indication.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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. The format is:

#CIPHIND: <mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable **#CIPHIND:** unsolicited result code Values: 0 : disable 1 : enable

AT#CIPHIND?

Read command reports the <**mode**>,<**cipher**> and <**SIM/USIM flag**>:

#CIPHIND: <mode>,<cipher>,<SIM/USIM flag>

Not Subject to NDA

Additional info:

- Here is the list of the parameters meaning returned by the read command.

Name	Type	Default	Description
<cipher>	integer	0	shows cipher status Values: 0 : cipher off 1 : cipher on 2 : unknown (missing network information)
<SIM/USIM flag>	integer	0	SIM/USIM cipher status indication Values: 0 : disabled 1 : enabled 2 : unknown (flag not read yet)

AT#CIPHIND=?

Test command reports the range for the parameter <**mode**>

Not Subject to NDA

3.4.62. AT#CLSMK - Control Classmark2 parameter

This command set command Classmark2 parameters used Uplink signal message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CLSMK=<idx>,<val>

Set command Classmark2 parameters used Uplink signal message.

Parameters:

Name	Type	Default	Description
<idx>	integer	N/A	Parameter index
	Values:		
	0 : Restore to default values		
	1 : Classmark 3 Indicator		
	2 : CM Service Prompt		
	3 : Short Message Capability		
	4 : Pseudo Synchronization Capability		
	5 : Controlled Early Classmark Sending(ES_IND)		
	6 : SS Screening Indicator		
	7 : LCS VA Capability(LCS_VAC)		
<val>	integer	N/A	value
	Values:		
	0 : Disable		
	1 : Enable		

Not Subject to NDA

- The values are depending on GSM support.
- After execution, module must be reset.
  Otherwise, a module doesn't work by changed value.
- When **<idx>** is 0, **<val>** has no effect. (dummy value)

AT#CLSMK?

Read command reports the **<val>** for each **<idx>**.

AT#CLSMK=?

Test command reports the ranges of the parameters **<idx>** and **<val>**.

Not Subject to NDA

3.4.63. AT#CRAC - Control Radio Access Capability

This command set command the nv items for controlling Radio Access Capability.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CRAC=<idx>,<val>

Set command the nv items for controlling Radio Access Capability.

Parameters:

Name	Type	Default	Description
<idx>	integer	N/A	parameter index

Values:

0 : All items

1 : NV_EDGE_FEATURE_SUPPORT_I

2 : NV_EDGE_8PSK_POWER_CLASS_I

3 : NV_GERAN_FEATURE_PACK_1_I

4 : NV_DTM_FEATURE_SUPPORT_I

5 : NV_EDA_FEATURE_SUPPORT_I

6 : NV_EDTM_FEATURE_SUPPORT_I

7 : NV_REPEATED_ACCH_I

8 : GPRS multislot support flag

9 : RF power support flag

10 : High multislot support flag

11 : GMSK multislot support flag

Not Subject to NDA

<val>	integer	N/A	value
Values: 0 : Disable 1 : Enable			

The values are depending on GSM support.

After execution, module must be reset.
Otherwise, a module doesn't work by changed value.

AT#CRAC?

Read command reports the **<val>** for each **<idx>**.

AT#CRAC=?

Test command reports the ranges of the parameters **<idx>** and **<val>**.

Not Subject to NDA

3.4.64. AT#RPMCFGEXT - RPM function configuration

This command configures RPM (Radio Policy Management) function.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RPMCFGEXT=<app_max_num_reset>,<app_reset_counter>,<app_reset_timer>,<app_reset_blk_leak_rate_timer>,<avg_reset_time>,<leak_rate_time>,<backoff_cnt_0>,<backoff_cnt_1>,<backoff_cnt_2>,<backoff_cnt_3>,<cpdp_cnt_0>,<cpdp_cnt_1>,<cpdp_cnt_2>,<cpdp_cnt_3>,<lr3_timer>

Set command sets the RPM configuration parameter.

Parameters:

Name	Type	Default	Description
<app_max_num_reset>	integer	N/A	N1. Max number of SW resets per Hour allowed by RPM following "permanent" MM/GMM/EMM reject Value: 0÷255 : max number
<app_reset_counter>	integer	N/A	APP-initiated reset per hour Value: 0÷255 : reset counter
<app_reset_timer>	integer	N/A	1 hour Timer for tracking APP initiated reset

Not Subject to NDA

	Value: 0÷65535 : reset timer		
<app_reset_blk_leak_rate_timer>	integer	N/A	LR-1. Leak rate for C-BR-1 (Counter related to N1) Value: 0÷65535 : leak rate timer
<avg_reset_time>	integer	N/A	T1. Average time before RPM resets modem following permanent MM/GMM/EMM reject Value: 0÷255 : reset time
<leak_rate_time>	integer	N/A	LR-2. Leak rate for C-R-1 (Counter related to T1) Value: 0÷65535 : leak rate time
<backoff_cnt_0>	integer	N/A	F1. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a PDP Activation ignore Scenario. Value:

Not Subject to NDA

	0÷255 : backoff_cnt_0		
<backoff_cnt_1>	integer	N/A	F2. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a "Permanent" PDP Activation Reject. Value: 0÷255 : backoff_cnt_1
<backoff_cnt_2>	integer	N/A	F3. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a "Temporary" PDP Activation Reject. Value: 0÷255 : backoff_cnt_2
<backoff_cnt_3>	integer	N/A	F4. Max number of PDP context or PDN Connectivity Activation/Deactivation Requests per Hour allowed by RPM. Value: 0÷255 : backoff_cnt_3

Not Subject to NDA

<cpdp_cnt_0>	integer	N/A	CPDP-1 Value: 0÷255 : cpdp_cnt_0
<cpdp_cnt_1>	integer	N/A	CPDP-2 Value: 0÷255 : cpdp_cnt_1
<cpdp_cnt_2>	integer	N/A	CPDP-3 Value: 0÷255 : cpdp_cnt_2
<cpdp_cnt_3>	integer	N/A	CPDP-4 Value: 0÷255 : cpdp_cnt_3
<lr3_timer>	integer	N/A	LR-3. Leak Rate3 timer (hour). Leak rate for CPDP-1 to C-PDP-4 (Counter related to F1) Value: 0÷255 : lr3_timer

AT#RPMCFGEXT?

Read command reports the RPM configuration parameter.

#RPMCFGEXT: <app_max_num_reset>,<app_reset_counter>,<app_reset_timer>,<app_reset_blk_leak_rate_timer>,<avg_reset_time>,<leak_rate_time>,<backoff_cnt_0>,<backoff_cnt

Not Subject to NDA

_1>,<backoff_cnt_2>,<backoff_cnt_3>,<cpdp_cnt_0>,<cpdp_cnt_1>,<cpdp_cnt_2>,<cpdp_cnt_3>,<lr3_timer>

AT#RPMCFGEXT=?

Test command returns **OK** result.

Not Subject to NDA

3.4.65. AT#RPMCFG - RPM function enable

This command enables/disables RPM (Radio Policy Management) function.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RPMCFG=<rpm_ena>

Set command enables/disable the RPM function.

Parameter:

Name	Type	Default	Description
<rpm_ena>	integer	N/A	Indicates whether RPM functionality is to be enabled or disabled at power up Values: 0 : Disabled 1 : Enabled

AT#RPMCFG?

Read command reports RPM function status.

#RPMCFG: <rpm_ena>

AT#RPMCFG=?

Test command returns **OK** result.

Not Subject to NDA

3.4.66. AT#CEERNET - Extended Numeric Error Report for Network Reject Cause

The command is related to extended numeric error report.

3GPP TS 24.008
3GPP TS 24.301

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CEERNET

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

#CEERNET: <code>

which should offer the user of the TA a report for the last mobility management (MM/GMM/EMM) or session management (SM/ESM) procedure not accepted by the network.

Additional info:

1. The following error codes are valid for mobility management (MM/GMM) or session management (SM), i.e. for 2G and 3G networks.
2. In 4G network the **<code>**s meanings are included in tables 9.9.4.4.1 (for ESM causes) and 9.9.3.9.1 (for EMM cause) of 3GPP TS 24.301 Release 9.

Name	Type	Default	Description
<code>	integer	N/A	error code
	Values:		

Not Subject to NDA

1	:	SM unknown cause
2	:	IMSI unknown in HLR
3	:	illegal MS
4	:	IMSI unknown in VISITOR LR
5	:	IMEI not accepted
6	:	illegal ME
7	:	GPRS not allowed
8	:	Operator determined barring (SM cause failure)/ GPRS and not 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

Not Subject to NDA

24 : MBMS bearer capabilities insufficient for the service

25 : LLC or SNDCP failure

26 : insufficient resources

27 : missing or unknown APN

28 : unknown PDP address or PDP type

29 : user authentication failed

30 : activation rejected by GGSN

31 : activation rejected unspecified

32 : service option not supported

33 : req. service option not subscribed

34 : serv. option temporarily out of order

35 : NSAPI already used

36 : regular deactivation

37 : QOS not accepted

38 : call cannot be identified (MM cause failure) / SMN network failure (SM cause failure)

39 : reactivation required

40 : no PDP context 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 context

44 : semantic err in PKT filter

Not Subject to NDA

45	:	syntactical err in PKT filter
46	:	PDP context 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

If none of this condition has occurred since power up then <code> 0: "**Normal, unspecified**" condition is reported.

Not Subject to NDA

The <code> 1 cannot be used in ota.

Detach request reject cause from the network also be reported.

AT#CEERNET=?

Test command returns **OK** result code.

Not Subject to NDA

3.4.67. AT#BNDRAM - Select Band without storing NVM

This command selects RF bands without storing NVM

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BNDRAM=[<band>[,<UMTS_band>[,<LTE_band>[,<TDSCDMA_band>]]]]

Set command selects the current GSM, UMTS, LTE, and TDSCDMA bands without storing NV

Parameters:

Name	Type	Default	Description
<band>	integer	N/A	GSM band selection. The default value depends on the product. Values: 0 : GSM 900 MHz + DCS 1800 MHz 1 : GSM 900 MHz + PCS 1900 MHz 2 : GSM 850 MHz + DCS 1800 MHz 3 : GSM 850 MHz + PCS 1900 MHz 4 : GSM 900 MHz + DCS 1800 MHz + PCS 1900 MHz 5 : GSM 900 MHz + DCS 1800 MHz + PCS 1900 MHz + GSM 850 MHz
<UMTS_band>	integer	N/A	UMTS band selection. The default value depends on the product. Values: 0 : B1 (2100 MHz)

Not Subject to NDA

1 : B2 (1900 MHz)

2 : B5 (850 MHz)

3 : B1 (2100 MHz) + B2 (1900 MHz) + B5 (850 MHz)

4 : B2 (1900 MHz) + B5 (850 MHz)

5 : B8 (900 MHz)

6 : B1 (2100 MHz) + B8 (900 MHz)

7 : B4 (1700 MHz)

8 : B1 (2100 MHz) + B5 (850 MHz)

9 : B1 (2100 MHz) + B8 (900 MHz) + B5 (850 MHz)

10 : B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz)

11 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B8 (900 MHz)

12 : B6 (800 MHz)

13 : B3 (1800 MHz)

14 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz)

15 : B1 (2100 MHz) + B8 (900 MHz) + B3 (1800 MHz)

16 : B8 (900 MHz) + B5 (850 MHz)

17 : B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz) + B6 (800 MHz)

18 : B1 (2100 MHz) + B5 (850 MHz) + B6 (800 MHz) + B8 (900 MHz)

19 : B2 (1900 MHz) + B6 (800 MHz)

Not Subject to NDA

20 : B5 (850 MHz) + B6 (800 MHz)

21 : B2 (1900 MHz) + B5 (850 MHz) + B6 (800 MHz)

22 : B1 (2100 MHz) + B3 (1800 MHz) + B5 (850 MHz) + B8 (900 MHz)

23 : B1 (2100 MHz) + B3 (1800 MHz)

24 : B1 (2100 MHz) + B2 (1900 MHz) + B4 (1700 MHz) + B5 (850 MHz)

25 : B19 (850 MHz)

26 : B1 (2100 MHz) + B5 (850 MHz) + B6 (800 MHz) + B8 (900 MHz) + B19 (850 MHz)

<LTE_band>	hex	N/A	indicates the LTE supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 32 bits):

Values:

0x00000 : No bands allowed

0x00001 : EUTRAN BAND1

0x00002 : EUTRAN BAND2

0x00004 : EUTRAN BAND3

0x00008 : EUTRAN BAND4

0x00010 : EUTRAN BAND5

0x00040 : EUTRAN BAND7

0x00080 : EUTRAN BAND8

0x00800 : EUTRAN BAND12

0x01000 : EUTRAN BAND13

Not Subject to NDA

			0x02000 : EUTRAN BAND14 0x10000 : EUTRAN BAND17 0x80000 : EUTRAN BAND20 0x1000000 : EUTRAN BAND25 0x2000000 : EUTRAN BAND26 0x8000000 : EUTRAN BAND28 0x00200000000 : EUTRAN BAND34 0x02000000000 : EUTRAN BAND38 0x04000000000 : EUTRAN BAND39 0x08000000000 : EUTRAN BAND40 0x10000000000 : EUTRAN BAND41 0x8000000000000 : EUTRAN BAND66 0x0800000000000000 : EUTRAN BAND71
<TDSCDMA_band>	hex	N/A	indicates the LTE supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 32 bits): Values: 0x00000 : No bands allowed 0x00001 : TDS BAND34 A 0x00020 : TDS BAND39 F 0x00010 : TDS BAND40 E

127 - GSM/WCDMA invalid value

Not Subject to NDA

FFFFFFFFFFFFFFFF - LTE/TDSCDMA invalid value for all models

In set command **LTE/TDSCDMA band mask** should be entered in HEX format without **"0x"**.

In Read and test commands it also appears without "0x".

In set command, "NULL" input value is acceptable except last input parameter.

And "NULL" means that previous value is remained.

Example:

AT#BNDRAM=5,15,800C5

OK

AT#BNDRAM=5,,800C5

OK

Init values of bands for **#BNDRAM** depends on the values of **#BND**.

If **<mode>** of **#SELBNDMODE** is 0, the bands of **#BNDRAM** cannot be set. On the other hands, if **<mode>** of **#SELBNDMODE** is 1, the bands of **#BNDRAM** can be set.

AT#BNDRAM?

Read command returns the current selected band in the format:

#BNDRAM: < GSM_band >[, < WCDMA_band >[,< LTE_band_mask >[,< TDSCDMA_band_mask >]]]

AT#BNDRAM=?

Test command returns the supported range of values of parameters **< GSM_band >, < WCDMA_band >,< LTE_band_mask >,< TDSCDMA_band_mask >, if the technology supported by model.**

LTE and TDSCDMA bands shown as maximal bit mask for model in HEX.

Example:

Not Subject to NDA

AT#BNDRAM=?

#BNDRAM: (0-5),(0,5,6,13,15),(800C5)

OK

800C5 LTE bit mask means all combinations of next bands could be accepted by SET command:

0x00000 No bands allowed

0x00001 EUTRAN BAND1

0x00004 EUTRAN BAND3

0x00040 EUTRAN BAND7

0x00080 EUTRAN BAND8

0x80000 EUTRAN BAND20

Not Subject to NDA

3.4.68. AT#RATORDER - Set RAT acquisition order

The command sets the Radio Access Technology (RAT) acquisition order.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RATORDER=<RAT1>,<RAT2>,<RAT3>

Set command allows to configure the Radio Access Technology (RAT) acquisition order when more technologies (2G/3G/LTE) are available.

Parameters:

Name	Type	Default	Description
<RAT1>	integer	N/A	sets the first technology in priority table Values: 3 : 2 G 5 : 3 G 9 : LTE
<RAT2>	integer	N/A	sets the second technology in priority table Values: 3 : 2 G 5 : 3 G 9 : LTE
<RAT3>	integer	N/A	sets the third technology in priority table Values: 3 : 2 G 5 : 3 G

Not Subject to NDA

The setting is saved in NVM and available at next reboot.

AT#RATORDER?

Read command reports the current parameters values.

AT#RATORDER=?

Test command returns the supported values of parameters <RAT1>, <RAT2> and <RAT3>.

Not Subject to NDA

3.5. Phonebook

3.5.1. AT+CPBS - Select Phonebook Memory Storage

This command selects phonebook memory storage, which is used by other phonebook commands.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CPBS=<storage>[,<password>]

Set command selects phonebook memory storage, which is used by other phonebook commands.

Parameters:

Name	Type	Default	Description
<storage>	string	"SM"	the phonebook memory storage

Values:

"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)

Not Subject to NDA

			"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 (MSI storage may be available through +CNUM also. +CPBF is not applicable for this storage) "SD" : SIM Service Dialing Numbers (SDN) phonebook (+CPBW is not applicable for this storage)
<password>	string	-	the PIN2-code required when selecting PIN2-code locked <**storage**>s above "FD"; If <**password**> parameter is given, PIN2 will be verified, even if it is not required, i.e. PIN2 is verified even if it has already been inserted and verified during current session.

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.

AT+CPBS?

Not Subject to NDA

Read command returns currently selected memory, number of used locations and total number of locations in the memory, in the format:

+CPBS: <storage>,<used>,<total>

For <**storage**>="MC": if there are more than one missed call from the same number the read command will return only the last call.

AT+CPBS=?

Test command returns the supported range of values for the parameter <**storage**>.

Current phonebook storage is SIM.

AT+CPBS="SM"

OK

AT+CPBR=1

+CPBR: 1,"0105872928",129,"James"

OK

Not Subject to NDA

3.5.2. AT+CPBR - Read Phonebook Entries

The command reads phonebook entries.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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 left out, only location <**index1**> is returned.

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>]]]

Parameters:

Name	Type	Default	Description
<index1>	integer	-	value in the range of location numbers of the currently selected phonebook memory (see **+CPBS**)
<index2>	integer	-	value in the range of location numbers of the currently selected phonebook memory (see **+CPBS**)

Additional info:

Not Subject to NDA

▶▶ response parameters

Name	Type	Default	Description
<indexn>	integer	-	the location numbers of phonebook memory
<number>	string	-	phone number of format <**type**>
<type>	integer	N/A	type of address octet Values: 129 : national numbering scheme 145 : international numbering scheme (contains the character "+")
<text>	string	-	the alphanumeric text associated with the number; character set as specified by command select TE character set **+CSCS**
<hidden>	integer	0	indicates if the entry is hidden or not Values: 0 : phonebook entry not hidden 1 : phonebook entry hidden
<group>	string	-	indicating a group the entry may belong to; character set as specified by command select TE character set **+CSCS**
<adnumber>	string	-	an additional phone number of format <**adtype**>
<adtype>	integer	-	type of address octet

Not Subject to NDA

<secondtext>	string	-	second text field associated with the number; character set as specified by command select TE character set **+CSCS**
<email>	string	-	email field; character set as specified by command select TE character set **+CSCS**

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.

If all queried locations are empty (but available), no information text lines may be returned. If listing fails in an MT error, **+CME ERROR: <err>** is returned.

AT+CPBR=?

Test command returns location range supported by the current storage as a compound value and the maximum lengths of <**number**>, <**text**>, <**group**>, <**secondtext**> and <**email**>, in the format:

+CPBR: (<minIndex> - <maxIndex>),<nlength>,<tlength>,<glength>,<slength>,<elength>

Additional info:

▶▶ response parameters

Name	Type	Default	Description
<minIndex>	integer	-	the minimum <**index**> number

Not Subject to NDA

<maxIndex>	integer	-	the maximum <**index**> number
<nlength>	integer	-	the maximum length of field <**number**>
<tlength>	integer	-	the maximum length of field <**text**>
<glength>	integer	-	the maximum length of field <**group**>
<slength>	integer	-	the maximum length of field <**secondtext**>
<elength>	integer	-	the maximum length of field <**email**>

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

Remember to select the PB storage with **+CPBS** command before issuing PB commands.

Not Subject to NDA

```
AT+CPBS="ME"
OK
AT+CPBS?
+CPBS: "ME",1,100

OK
AT+CPBR=?
+CPBR: (1-100),40,255

OK
AT+CPBR=1
+CPBR: 1,"01048771234",129,"James"

OK
```


Not Subject to NDA

3.5.3. AT+CPBF - Find Phonebook Entries

This command search phonebook record from the current phonebook memory storage selected with **+CPBS**.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	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:

Name	Type	Default	Description
<findtext>	string	-	string to be searched among the phonebook entries; character set as specified by command select TE character set **+CSCS**

Additional info:

This command returns the response in the following format:

[+CPBF:<index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]<CR><LF>

+CPBF:<index2>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>][...]]]

Name	Type	Default	Description

Not Subject to NDA

<indexn>	integer	-	the location number of the phonebook entry
<number>	string	-	phone number of format <**type**>
<type>	integer	N/A	type of address octet Values: 129 : national numbering scheme 145 : international numbering scheme (contains the character "+")
<text>	string	-	the alphanumeric text associated with the number; character set as specified by command select TE character set **+CSCS**
<group>	string	-	a group the entry may belong to; character set as specified by command select TE character set **+CSCS**
<adnumber>	string	-	an additional number of format <**adtype**>
<adtype>	integer	-	type of address octet
<secondtext>	string	-	a second text field associated with the number; character set as specified by command select TE character set **+CSCS**
<email>	string	-	an email field; character set as specified by command select TE character set **+CSCS**
<hidden>	string	N/A	indicates if the entry is hidden or not Values: 0 : phonebook entry not hidden 1 : phonebook entry hidden

Not Subject to NDA

- **+CPBF** is not applicable if the current selected storage (see **+CPBS**) is either "MC", "RC" or "LD".
- If <**findtext**>="", the command returns all the phonebook records.
- If no PB records satisfy the search criteria, then an **ERROR** message is reported.

AT+CPBF=?

Test command returns the maximum lengths of <**number**>, <**text**>, <**group**>, <**secondtext**> and <**email**>, in the format:

+CPBF: <nlength>,<tlength>,<glength>,<slength>,<elength>

Additional info:

- response parameters

Name	Type	Default	Description
<nlength>	integer	-	the maximum length of field <**number**>
<tlength>	integer	-	the maximum length of field <**text**>
<glength>	integer	-	the maximum length of field <**group**>
<slength>	integer	-	the maximum length of field <**secondtext**>
<elength>	integer	-	the maximum length of field <**email**>

Not Subject to NDA

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

Remember to select the PB storage with **+CPBS** command before issuing PB commands.

Selecting phonebook

AT+CPBS="ME"

OK

Searching for string "J"

AT+CPBF="J"

+CPBF: 1,"01048771234",129,"James"

+CPBF: 2,"0169998888",129,"Jane"

OK

Searching for everything in phone book, and finding all entries

AT+CPBF=""

+CPBF: 1,"01048771234",129,"James"

+CPBF: 2,"0169998888",129,"Jane"

+CPBF: 7,"0115556666",129,"Juliet"

+CPBF: 5,"0181111234",129,"Kevin"

OK

Not Subject to NDA

Not Subject to NDA

3.5.4. AT+CPBW - Write Phonebook Entry

This command writes phonebook entry in the current phonebook memory.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT+CPBW=[<index>][,<number>[,<type>[,<text>[,<group>[,<adnumber>[,<adtype>[,<secondtext>[,<email>[,<hidden>]]]]]]]]]

Execution command writes phonebook entry in location number <**index**> in the current phonebook memory storage selected with **+CPBS**.

Parameters:

Name	Type	Default	Description
<index>	integer	-	the location numbers of phonebook memory
<number>	string	-	phone number in the format <**type**>
<type>	integer	129	type of address octet
	Values:		
	129	:	national numbering scheme
	145	:	international numbering scheme (contains the character "+")
<text>	string	-	the alphanumeric text associated with the number; character set as specified by command select TE character set **+CSCS**
<group>	string	-	a group the entry may belong to; character set as specified by

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			command select TE character set **+CSCS**
<adnumber>	string	-	an additional number of format **<adtype>**
<adtype>	integer	-	type of address octet
<secondtext>	string	-	a second text field associated with the number; character set as specified by command select TE character set **+CSCS**
<email>	string	-	email field; character set as specified by command select TE character set **+CSCS**
<hidden>	integer	0	indicates if the entry is hidden or not Values: 0 : phonebook entry not hidden 1 : phonebook entry hidden

If record number **<index>** already exists, it will be overwritten.

If either **<number>**, **<type>** and **<text>** are omitted, the phonebook entry in location **<index>** is deleted.

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.

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

Not Subject to NDA

overwrite with it one of the old predefined strings, using **#CPBGW** command.

AT+CPBW=?

Test command returns location range supported by the current storage and types of address as compound values, the maximum length of <**number**> field, supported number formats of the storage, the maximum length of <**text**> field, the maximum length of <**group**>, the maximum length of <**secondtext**> and the maximum length of <**email**>. The format is:

+CPBW: (list of supported **<index>**s),**<nlength>,**(list of supported **<type>**s),**<tlength>, <glength>,<slength>,<elength>**

Additional info:

- response fields

Name	Type	Default	Description
<nlength>	integer	-	Maximum length of field <**number**>
<tlength>	integer	-	Maximum length of field <**text**>
<glength>	integer	-	Maximum length of field <**group**>
<slength>	integer	-	Maximum length of field <**secondtext**>
<elength>	integer	-	Maximum length of field <**email**>

Not Subject to NDA

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

Remember to select the PB storage with **+CPBS** command before issuing PB commands.

if <**index**> is omitted or <**index**>=0, the number <**number**> is stored in the first free phonebook location.

AT+CPBW=0,"+39040X192YZ1",129,"Text"

AT+CPBW=,"+39040X192YZ1",129,"Text"

Not Subject to NDA

3.5.5. AT#CPBGR - Read Group Entries

This command returns Grouping information Alpha String (GAS) USIM file entries.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CPBGR=<indexFirst>[,<indexLast>]

Set command returns Grouping information Alpha String (GAS) USIM file entries in location number range <**indexFirst**>...<**indexLast**>. If <**indexLast**> is omitted, only location <**indexFirst**> is returned. The response, for each location, is a string. This string is a name used for a group the ADN entries can belong to.

The response format is:

[#CPBGR: <index1>,<text1>[<CR><LF>
#CPBGR: <index2>,<text2>[...]]]

Parameters:

Name	Type	Default	Description
<indexFirst>	integer	NA	first location to be read
	Value:		
	minIndex÷maxIndex	:	range of location numbers of GAS, where "minIndex" and "maxIndex" can be obtained by issuing the test command
<indexLast>	integer	NA	last location to be read
	Value:		

Not Subject to NDA

minIndex÷maxIndex : range of location numbers of GAS, where "minIndex" and "maxIndex" can be obtained by issuing the test command

Additional info:

- Response parameters:

Name	Type	Default	Description
<index>	integer	N/A	location number of the GAS entry Value: indexFirst÷indexLast : range of location numbers of GAS returned in the response
<text>	string	-	alphanumeric text associated to the entry

AT#CPBGR=?

Test command returns the supported values of the parameters <**index***n*> and the maximum length of <**text**> field, in the format:

#CPBGR: (**<minIndex>** - **<maxIndex>**),**<tlength>**

Additional info:

- Parameters:

Name	Type	Default	Description
<minIndex>	integer	-	minimum <**index**> number

Not Subject to NDA

<maxIndex>	integer	-	maximum <**index**> number
<tlength>	integer	-	maximum <**text**> field length

Not Subject to NDA

3.5.6. AT#CPBGW - Write Group Entry

Set command writes the name of a phonebook group <**text**> in the Grouping information Alpha String (GAS) USIM file in a specified location number <**index**>.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CPBGW=<index>,<text>

Parameters:

Name	Type	Default	Description
<index>	integer	-	number of the record in the GAS file to be written; value ranges from 1 to the number of records of the GAS file, that varies from USIM to USIM
<text>	string	-	text to be stored in the record

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>**

Additional info:

Parameter:

Not Subject to NDA

Name	Type	Default	Description
<tlength>	integer	-	maximum length of field <**text**> in bytes; actual maximum number of characters that can be stored depends upon <**text**> coding (see **+CSCS**)

Not Subject to NDA

3.5.7. AT#CPBD - Delete All Phonebook Entries

This command deletes all phonebook entries.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#CPBD

Execution command deletes all phonebook entries in the current phonebook memory storage selected with **+CPBS**.

AT#CPBD=?

Test command returns **OK** result code.

Not Subject to NDA

3.5.8. AT#CPBE - Emergency Numbers Programming

This command is used to write the emergency number to "EN" phonebook for carrier certification.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#CPBE=<index>[,<number>]

Set command writes the emergency number to "EN" phonebook.

Parameters:

Name	Type	Default	Description
<index>	integer Value: 1÷10 : index	N/A	index
<number>	string	-	phone number

If **<number>** is omitted, the phonebook entry in location **<index>** is deleted.

AT#CPBE?

Read command returns the emergency numbers stored by the user.

AT#CPBE=?

Test command reports the supported range of value for **<index>** and the maximum length of **<number>**.

Not Subject to NDA

AT+CPBR=1,117

+CPBR: 78,"911",129,"",,"","",,"","",""

+CPBR: 79,"112",129,"",,"","",,"","",""

+CPBR: 80,"*911",129,"",,"","",,"","",""

+CPBR: 81,"#911",129,"",,"","",,"","",""

+CPBR: 82,"*272911",129,"",,"","",,"","",""

OK

AT#CPBE=1,"999"

OK

AT+CPBR=1,117

+CPBR: 68,"999",129,"",,"","",,"","",""

+CPBR: 78,"911",129,"",,"","",,"","",""

+CPBR: 79,"112",129,"",,"","",,"","",""

+CPBR: 80,"*911",129,"",,"","",,"","",""

+CPBR: 81,"#911",129,"",,"","",,"","",""

+CPBR: 82,"*272911",129,"",,"","",,"","",""

OK

Not Subject to NDA

3.6. SMS & CB

3.6.1. AT+CSMS - Select Message Service

This command selects messaging service type.

3GPP TS 27.005

3GPP TS 23.040

3GPP TS 23.041

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CSMS=<service>

Set command selects messaging service <**service**>. It returns the types of messages supported by the ME:

+CSMS: <mt>,<mo>,<bm>

For parameters meaning see Additional info section.

Parameter:

Name	Type	Default	Description
<service>	integer	0	Select Message Service

Values:

0 : 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005

Not Subject to NDA

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

Additional info:

▶▶ Parameters meaning of the returned message.

Name	Type	Default	Description
<mt>	integer	N/A	mobile terminated messages support Values: 0 : type not supported 1 : type supported
<mo>	integer	N/A	mobile originated messages support Values: 0 : type not supported 1 : type supported
<bm>	integer	N/A	broadcast type messages support Values: 0 : type not supported 1 : type supported

Setting of <**service**> will not be stored automatically.

Not Subject to NDA

AT+CSMS?

Read command reports current service setting along with supported message types in the format:

+CSMS: <service>, <mt>, <mo>, <bm>

AT+CSMS=?

Test command reports the supported value of the parameter <**service**>.

Not Subject to NDA

3.6.2. AT+CPMS - Preferred Message Storage

The command selects the memory storage used by SMs (Short Messages).

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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

The command returns the memory storage status in the format:

+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>,<totals>

The returned parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<memr>	string	SM	memory from which messages are read and deleted

Values:

ME : SMS memory storage in Flash

SM : SIM SMS memory storage

SR : Status Report message storage (in SIM EF-SMSR file exists otherwise in the RAM non-volatile memory)

Not Subject to NDA

<memw>	string	SM	memory to which writing and sending operations are made
	Values: ME : SMS memory storage in Flash SM : SIM SMS memory storage		
<mems>	string	SM	memory to which received SMs are preferred to be stored
	Values: ME : SMS memory storage in Flash SM : SIM SMS memory storage		

Additional info:

▶▶ Here is the meaning of the parameters returned by the command.

Name	Type	Default	Description
<usedr>	integer	-	number of SMs stored in <**memr**>
<totalr>	integer	-	max number of SMs that <**memr**> can contain
<usedw>	integer	-	number of SMs stored in <**memw**>
<totalw>	integer	-	max number of SMs that <**memw**> can contain
<useds>	integer	-	number of SMs stored in <**mems**>
<totals>	integer	-	max number of SMs that <**memw**> can contain

Not Subject to NDA

"SR" non-volatile memory is cleared when another SIM card is inserted. It is kept, even after a reset, while the same SIM card is inserted.

AT+CPMS?

Read command reports the message storage status.

+CPMS:<memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>,<mems>, <useds>,<totals>

The parameters are described in previous sections.

AT+CPMS=?

Test command reports the supported values for parameters <**memr**>, <**memw**> and <**mems**>.

```
AT+CPMS="SM","ME","SM"
+CPMS: 1,20,27, 50,1,20
OK

AT+CPMS?
+CPMS: "SM",1,20,"ME",27, 50,"SM",1,20
OK
```

You have 1 out of 20 SMS SIM positions occupied

Not Subject to NDA

3.6.3. AT+CMGF - Message Format

Selects the format of SMS messages to be used in following SMS commands.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CMGF=[<mode>]

Set command selects the format of SMS messages used with send, list, read and write commands.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	format to use for SMS operations Values: 0 : PDU mode 1 : text mode

AT+CMGF?

Read command reports the current value of the parameter **<mode>** in the format:

+CMGF: <mode>

AT+CMGF=?

Test command returns the supported values of parameter **<mode>**.

Not Subject to NDA

Not Subject to NDA

3.6.4. AT+CSCA - Service Center Address

This command allows to set the Service Center Address for SMS transmissions.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT+CSCA=<number>[,<type>]

Set command sets the Service Center Address to be used for mobile originated SMS transmissions

Parameters:

Name	Type	Default	Description
<number>	string	-	String type phone number of forwarding address in format specified by **<type>** parameter
<type>	integer	N/A	The type of number; For Verizon FW, the range of **<type>** is 0 - 255. Values: 129 : National numbering scheme 145 : International numbering scheme (contains the character "+")

AT+CSCA?

Read command reports the current value of the SCA in the format:

Not Subject to NDA

+CSCA: <number>,<type>

If SCA is not present the device reports an error message.

AT+CSCA=?

Test command returns the **OK** result code.

To use the SM service, is mandatory to set a Service Center Address at which service requests will be directed.

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.

The current settings are stored through **+CSAS**.

```
AT+CSCA="821029190903",145
OK

AT+CSCA?
+CSCA: "+821029190903",145
OK
```


Not Subject to NDA

3.6.5. AT+CSMP - Set Text Mode Parameters

This command is used to select values for additional parameters for storing and sending SMS when the text mode is used (**AT+CMGF=1**).

3GPP TS 23.40
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	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:

Name	Type	Default	Description
<fo>	integer	17	first octet of SMS-SUBMIT or SMS-DELIVER PDU, as described in 3GPP TS 23.040 **bit 0/1** = Message Type Indicator **bit 2** = Reject Duplicates **bit 3/4** = Validity Period Format **bit 5** = Status Report Request **bit 6** = User Data Header Indicator **bit 7** = Reply Path
	Value: 0÷255 : mask		
<vp>	mixed	167	Validity Period, the format depends on Validity Period Format in **<fo>**, as described in 3GPP TS 23.040:

Not Subject to NDA

			bit 3 / bit 4 / Format 0 / 0 / Validity Period not present 0 / 1 / Validity Period present, enhanced format 1 / 0 / Validity Period present, relative format 1 / 1 / Validity Period present, absolute format Value: 0÷255 : range for Validity Period in relative format
<pid>	integer	0	TP-Protocol-Identifier, as described in 3GPP TS 23.40 Value: 0÷255 : described in 3GPP TS 23.40
<dcs>	integer	0	SMS Data Coding Scheme, as described in 3GPP TS 23.038 Value: 0÷255 : described in 3GPP TS 23.038

In the parameter <**fo**>: only the following values are supported for Message Type Indicator:
[00] - SMS-DELIVER
[01] - SMS-SUBMIT

In the parameter <**fo**>: user is not responsible for setting **bit 2** and **bit 6**, if set, they will have no meaning.

In the parameter <**vp**>: the *absolute format* is a quoted time-string type (see **+CCLK** *)*

The current settings are stored through **+CSAS**.

Not Subject to NDA

<vp> is stored only as integer type, i.e. only in its *relative format*.

<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 returns the current setting in the format:

+CSMP: <fo>,<vp>,<pid>,<dcs>

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.

Not Subject to NDA

- Set the parameters for an outgoing message with 24 hours of validity period and default properties:
  AT+CSMP=17,167,0,0
  OK

  Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 24 hours of validity period.
  AT+CSMP=9,"01A80000000000"
  OK

  Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 60 seconds of validity period.
  AT+CSMP=9,"023C0000000000"
  OK

  Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 29 hours 85 minutes 30 seconds of validity period.
  AT+CSMP=9,"03925803000000"
  OK

Not Subject to NDA

3.6.6. AT+CSDH - Show Text Mode Parameters

This command controls whether detailed header information is shown in text mode.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CSDH=[<show>]

Set command controls whether detailed header information is shown in text mode (**AT+CMGF=1**) result codes.

Parameter:

Name	Type	Default	Description
<show>	integer	0	control the display of the result codes.

Values:

0 : do not show header values (see Additional info section)

1 : show the values in result codes

Additional info:

If **<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>**

Not Subject to NDA

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>**.

Not Subject to NDA

3.6.7. AT+CSCB - Select Cell Broadcast

The command selects which types of Cell Broadcast Messages are to be received by the device.

3GPP TS 27.005
3GPP TS 23.041
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT+CSCB=[<mode>[,<mids>[,<dcss>]]]

Set command selects which types of Cell Broadcast Messages are to be received by the device

Parameters:

Name	Type	Default	Description
<mode>	integer	0	select which types of Cell Broadcast messages are to be received Values: 0 : the message types defined by <mids> and <dcss> are accepted 1 : the message types defined by <mids> and <dcss> are rejected
<mids>	string	-	message Identifiers: all different possible combinations of the CBM message identifiers; default is empty string ("").
<dcss>	string	-	Data Coding Schemes: all different possible combinations of CBM data coding schemes; default is empty string ("").

Not Subject to NDA

The current settings are stored also by **+CSAS** command

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**>.

Select a range

```
AT+CSCB=0,"0,1,300-315,450","0-3"
OK
```


Not Subject to NDA

3.6.8. AT+CSAS - Save Settings

Execution command saves settings which have been made by the **+CSCA**, **+CSMP** and **+CSCB** commands in local non-volatile memory.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CSAS=<profile>

Parameter:

Name	Type	Default	Description
<profile>	integer	0	Index of the profile where the settings are saved Values: 0 : it saves the settings to NVM 1÷n : SIM profile number; the value of <n> depends on the SIM.

Certain settings may not be supported by the SIM and therefore they are always saved to NVM, regardless the value of <**profile**>.

If parameter is omitted the settings are saved in the non-volatile memory.

AT+CSAS=?

Not Subject to NDA

Test command returns the possible range of values for the parameter <**profile**>.

Not Subject to NDA

3.6.9. AT+CRES - Restore Settings

Execution command restores message service settings saved by **+CSAS** command from either NVM or SIM.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CRES[=<profile>]

Parameter:

Name	Type	Default	Description
<profile>	integer	N/A	Defines which message service profiles to restore.

Values:

0 : restores message service settings from NVM

1÷n : restores message service settings from SIM. The n value depends on the SIM.

Certain settings may not be supported by the SIM and therefore they are always restored from NVM, regardless the value of **<profile>**

If parameter is omitted the command restores message service settings from NVM.

Not Subject to NDA

AT+CRES=?

Test command returns the possible range of values for the parameter **<profile>**.

Not Subject to NDA

3.6.10. AT+CMMS - More Message to Send

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.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CMMS=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables the relay protocol link continuity.

Values:

0 : disable

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)

Not Subject to NDA

Entering **AT+CMMS=** returns **OK** but has no effect.

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>**.

Not Subject to NDA

3.6.11. AT+CGSMS - Select Service for MO SMS Messages

Set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGSMS=[<service>]

Parameter:

Name	Type	Default	Description
<service>	integer	1	indicates the service or service preference to be used Factory default for VZW&NTT FW is 3.

Values:

0 : Packet Domain

1 : circuit switched

2 : Packet Domain preferred (use circuit switched if GPRS not available)

3 : circuit switched preferred (use Packet Domain if circuit switched not available)

Entering **AT+CGSMS=** returns **OK** but has no effect.

Not Subject to NDA

AT+CGSMS?

The read command returns the currently selected service or service preference in the format:

+CGSMS: <service>

AT+CGSMS=?

Test command reports the supported list of currently available <**service**>.

Not Subject to NDA

3.6.12. AT+CNMI - New Message Indications to Terminal Equipment

This command sets the parameters for receiving SMS messages.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]

Set command selects the behavior of the device on how the receiving of new messages from the network is indicated to the DTE.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	unsolicited result codes buffering option.

Values:

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, it enables the hardware ring line for 1 sec.

Not Subject to NDA

<mt>	integer	0	result code indication reporting for SMS-DELIVER.

Values:

0 : No SMS-DELIVER indications are routed to the TE and message is stored.

1 : If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the URC described in Additional info section.

2 : SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group) are routed directly to the TE using the URC described in the Additional info section.

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>	integer	0	broadcast reporting option

Values:

0 : Cell Broadcast Messages are not sent to the DTE

2 : New Cell Broadcast Messages are sent to the DTE with the URC described in Additional info section.

<ds>	integer	0	SMS-STATUS-REPORTs reporting option

Values:

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 URC described in the Additional info section.

Not Subject to NDA

2 : if a status report is stored, then the unsolicited result code, described in Additional info section, is sent.

<bfr>	integer	0	buffered result codes handling method

Values:

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.

Additional info:

▶▶ <mt>=1:

+CMTI: <mems>,<index>

▶▶ <mt>=2:

PDU mode

+CMT: <alpha>,<length><CR><LF><PDU>

TEXT mode

+CMT:<oa>,<alpha>,<scts>*[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]*<CR><LF> <data>

The parameters written in italics will be present depending on **+CSDH** last setting.

Not Subject to NDA

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

Acknowledge for the received SMS-DELIVER SM is sent to network immediately when **+CSMS <service>** is set to '0' or when **+CSMS <service>** is set to '1', acknowledge is sent via **+CNMA** command during predefine time-out, an error is sent to network in case timeout expire, next **+CMT** response is depend on acknowledge of current received **+CMT** response in case **+CSMS <service>** parameter set to '1'.

▶▶ **<bm>**=2:

PDU mode

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

Text mode

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

▶▶ **<ds>**=1:

PDU mode

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

TEXT mode

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

Acknowledge for the received SMS-STATUS-REPORT SM is sent to network immediately when **+CSMS <service>** is set to '0' or when **+CSMS <service>** is set to '1', acknowledge is sent via **+CNMA** command during pre-defined timeout, an error is sent to network in case timeout expire, next **+CDS** response is depend

Not Subject to NDA

on acknowledge of current received **+CDS** response in case **+CSMS <service>** parameter set to '1'.

▶▶ <ds>=2:

+CDSI: <mems>,<index>

Unsolicited fields:

Name	Type	Description
<mems>	string	memory storage where the new message is stored: "SM", "ME".
<index>	integer	location on the memory where SMS is stored.
<alpha>	string	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**.
<lenght>	integer	PDU length
<PDU>	string	PDU message
<oa>	string	originating address, string type converted in the currently selected character set (see **+CSCS**)
<alpha>	string	alphanumeric representation of <**oa**>; used character set should be the one selected with command **+CSCS**.
<scts>	string	arrival time of the message to the SC
<tooa>	integer	type of number <**oa**>: 129 - number in national format 145 - number in international format (contains the "+")
<fo>	string	first octet of message PDU, see 3GPP TS 03.40/23.040

Not Subject to NDA

<pid>	string	Protocol Identifier
<dcs>	string	Data Coding Scheme
<sca>	string	Service Centre address, string type, converted in the currently selected character set (see **+CSCS**)
<tosca>	integer	type of number <**sca**>: 129 - number in national format 145 - number in international format (contains the "+")
<length>	integer	text length
<data>	string	TP-User-Data * If <**dcs**> indicates that GSM 03.38 default alphabet is used and <**fo**> indicates that GSM 03.40 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 GSM 03.40 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.
<sn>	integer	message serial number
<mid>	integer	message ID
<dcs>	string	Data Coding Scheme
<pag>	integer	page number
<pags>	integer	total number of pages of the message
<data>	string	CBM Content of Message

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		* If <dcs> indicates that GSM 03.38 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)
<mr>	integer	message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<ra>	string	recipient address, string type, represented in the currently selected character set (see +CSCS)
<tora>	integer	type of number <ra>: 129 - number in national format 145 - number in international format (contains the "+")
<scts>	string	arrival time of the message to the SC
<dt>	string	sending time of the message
<st>	string	message status as coded in the PDU

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.

AT+CNMI?

Read command returns the current parameter settings for +CNMI command in the form:

Not Subject to NDA

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

AT+CNMI=?

Test command reports the supported range of values for the +CNMI command parameters

AT+CMGF=1
OK

AT+CNMI=1,2,0,1,0
OK

Received message from network

+CMT: "+821020955219",,"07/07/26,20:09:07+36"

TEST MESSAGE

Not Subject to NDA

3.6.13. AT+CMGL - List Messages

This command is used to list the messages.

3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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**).

Parameter:

Name	Type	Default	Description
<stat>	mixed	-	<**stat**> parameter type and the command output depend on the last settings of the **+CMGF** command (message format to be used). There are two modes: - PDU mode - Text mode See the following Additional info sections.

Additional info:

When message format is PDU mode, the <**stat**> parameter is:

Name	Type	Default	Description

Not Subject to NDA

<stat>	integer	N/A	status value
	Values: 0 : new message 1 : read message 2 : stored message not sent yet 3 : stored message already sent 4 : all messages		

▶▶ In case of PDU mode the representation format (see **+CMGF**) is:

+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[<CR><LF>
+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[...]]

Name	Type	Default	Description
<index>	integer	-	message position in the storage list.
<stat>	integer	-	message status. See the above <**stat**> parameter description.
<alpha>	string	-	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>	integer	-	PDU length in bytes
<pdu>	string	-	message in PDU format, according to 3GPP TS 23.040

▶▶ When message format is TEXT mode, the <**stat**> parameter is:

Not Subject to NDA

Name	Type	Default	Description
<stat>	string	N/A	status value
	Values:		
	"REC UNREAD"	:	new message
	"REC READ"	:	read message
	"STO UNSENT"	:	stored message not sent yet
	"STO SENT"	:	stored message already sent
	"ALL"	:	all messages

In case of TEXT mode, the representation format for stored messages (either sent or unsent) or received messages (either read or unread, not message delivery confirm) is:

+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>[...]]

The information written in italics will be present depending on **+CSDH** last setting.

Name	Type	Default	Description
<index>	integer	-	message position in the storage list.
<stat>	string	-	message status. See the above **<stat>** parameter description.

Not Subject to NDA

<oa/da>	string	-	originator/destination address, represented in the currently selected character set (see **+CSCS**).
<alpha>	string	-	The 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>	string	-	TP-Service Centre Time Stamp in Time String Format.
<tooa/toda>	integer	N/A	type of number <**oa/da**> For Verizon FW, the range of <**tooa/toda**> is 0 - 255. Values: 129 : number in national format 145 : number in international format (contains the "+")
<length>	integer	-	text length
<data>	string	-	TP-User-Data If <**dcs**> indicates that 3GPP TS 23.038 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

Not Subject to NDA

	converted into two IRA character long hexadecimal number. The <**length**> indicates text length in characters without UDH length.

▶▶ In case of TEXT mode, the representation format for delivery confirm messages is:

+CMGL:
<index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>[<CR><LF>
+CMGL: <index>,<stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>[...]]

Name	Type	Default	Description
<index>	integer	-	message position in the storage list.
<stat>	string	-	Message status. See the last <**stat**> parameter description.
<fo>	integer	-	first octet of the message PDU
<mr>	integer	-	message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<ra>	string	-	recipient address, represented in the currently selected character set (see **+CSCS**)
<tora>	string	-	type of number <**ra**>
<scts>	string	-	arrival time of the message to the SC
<dt>	string	-	sending time of the message
<st>	integer	-	message status as coded in the PDU

Not Subject to NDA

If parameter is omitted the command returns the list of SMS with **"REC UNREAD"** status.

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.

Not Subject to NDA

3.6.14. AT+CMGR - Read Message

This command is used to read a message.

3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<index>	integer	-	message index. The command output depends on the last settings of command **+CMGF** (message format to be used). There are two modes: - PDU mode - Text mode See the following Additional info sections.

Additional info:

In case of PDU mode, if there is a message in location <**index**>, the output has the following format:

+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>

Not Subject to NDA

Name	Type	Default	Description
<stat>	integer	N/A	status of the message Values: 0 : new message 1 : read message 2 : stored message not yet sent 3 : stored message already sent
<alpha>	string	-	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>	integer	-	PDU length in bytes
<PDU>	string	-	message in PDU format, according to 3GPP TS 23.040

▶▶ In case of Text mode, if there is a received message in location **<index>**, the output has the following format (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>**

In case of Text mode, 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>**

Not Subject to NDA

In case of Text mode, if there is a Message Delivery Confirm message in location <**index**> the output format is:

+CMGR: <stat>,<fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st>

Name	Type	Default	Description
<stat>	string	N/A	status of the message
	Values:		
	"REC UNREAD"	:	new received message
	"REC READ"	:	received message read
	"STO UNSENT"	:	message stored not yet sent
	"STO SENT"	:	message stored already sent
<fo>	integer	-	first octet of the message PDU
<mr>	integer	-	message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<ra>	string	-	recipient address, represented in the currently selected character set (see **+CSCS**)
<tora>	string	-	type of number <**ra**>
<scts>	string	-	arrival time of the message to the SC
<dt>	string	-	sending time of the message
<st>	integer	-	message status as coded in the PDU
<pid>	integer	-	Protocol Identifier
<dcs>	integer	-	Data Coding Scheme

Not Subject to NDA

<vp>	mixed	-	Validity Period; its format depends on SMS-SUBMIT <**fo**> setting (see **+CPMS**): 1. Not present: if <**fo**> tells that Validity Period Format is not present 2. Integer: if <**fo**> tells that Validity Period Format is relative 3. Quoted time-string type: if <**fo**> tells that Validity Period Format is absolute 4. Quoted hexadecimal representation of 7 octets: if <**fo**> tells that Validity Period Format is enhanced
<oa>	string	-	Originator address, represented in the currently selected character set (see **+CSCS**).
<da>	string	-	Destination address, represented in the currently selected character set (see **+CSCS**).
<alpha>	string	-	The 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>	string	-	Service Centre Address
<tooa>	integer	N/A	type of number of <**oa**> For Verizon FW, the range of <**tooa**> is 0 - 255. Values: 129 : number in national format 145 : number in international format (contains the "+")

Not Subject to NDA

<toda>	integer	N/A	type of number of <**da**> For Verizon FW, the range of <**toda**> is 0 - 255. Values: 129 : number in national format 145 : number in international format (contains the "+")
<tosca>	integer	N/A	type of number of <**sca**> For Verizon FW, the range of <**tosca**> is 0 - 255. Values: 129 : number in national format 145 : number in international format (contains the "+")
<length>	integer	-	text length
<data>	string	-	TP-User-Data If <**dcs**> indicates that 3GPP TS 23.038 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.

Not Subject to NDA

Both in PDU and Text Mode, if status of the message was 'received unread' before reading, then status in the storage changes to 'received read'

AT+CMGR=?

Test command returns the **OK** result code

Not Subject to NDA

3.6.15. AT+CNMA - New Message Acknowledgement

This command is used to confirm the correct reception of a new message.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

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, 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 in Additional info sections.

Additional info:

- PDU Mode

Not Subject to NDA

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.

Name	Type	Default	Description
<n>	integer	N/A	type of acknowledgement in PDU mode Values: 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>	integer	-	length of the PDU message

▶▶ Text Mode

AT+CNMA

Only positive acknowledgement to network (**RP-ACK**) is possible.

AT+CNMA=?

Test command returned information are different between SMS PDU Mode and SMS Text Mode, as explained below.

Not Subject to NDA

Additional info:

- PDU Mode

  Test command returns the possible range of values for the parameter <n>.

- Text Mode

  Test command returns the OK result code.

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.

Not Subject to NDA

- 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
  0681600058542600048098060OF170110370537284...

  Send positive acknowledgement to the network.
  AT+CNMA=0
  OK

  Message is received from network.
  +CMT: "",70
  0681600058542600048098060OF170110370537284...

  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

  AT+CNMI=2,2,0,0,0
  OK

Not Subject to NDA

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

Not Subject to NDA

3.6.16. AT+CMGS - Send Short Message

The command is related to sending short messages.

3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CMGS

Execution command sends a short message to the network. It can have two syntax formats according to the SMS format: PDU or Text mode (see **+CMGF** command). If short message is successfully sent to the network, the result is shown with the following URC:

+CMGS: <mr>[,<scts>]

Additional info:

- In PDU mode, the **+CMGS** command has the following syntax:

  AT+CMGS=<length>

  After command line is terminated with <CR>, the module 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. 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.

Not Subject to NDA

To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<length>	integer	N/A	length in bytes of the PDU to be sent (excluding the SMSC address octets)
	Value:		
	7÷164	:	number of bytes

▶▶ In Text mode, the **+CMGS** command has the following syntax:

AT+CMGS=<da>[,<toda>]

After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

After this prompt, you can enter text that 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><greater_than><space> is sent to the TE.

Not Subject to NDA

- 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)

To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<da>	string	-	destination address, string type represented in the currently selected character set (see +CSCS).
<toda>	string	129	type of destination address For Verizon FW, the range of <toda> is 0 - 255. Values: 129 : number in national format 145 : number in international format (contains the "+")

Unsolicited fields:

Name	Type	Description
<mr>	integer	TP-Message-Reference number as per 3GPP TS 23.040
<scts>	string	TP-Service Centre Time Stamp in Time String Format. <scts> is returned when +CSMS <service> value is 1 and network supports.

Not Subject to NDA

- The DCD signal shall be in **ON** state while data is entered. The echoing of data is controlled by echo command **E.**
- In PDU mode: when the length of the SMSC address equals 0, then the SMSC address set with command **+CSCA** is used; in this case the SMSC Type of Address octet shall not be present in the data.
- To ensure that during the command execution, which may take several seconds, no other SIM interacting commands issued, care must take.
- It is possible to send a concatenation of at most 16 SMs; the maximum number of chars depends on the <**dcs**>:
  - 2432 chars
  - 2128 chars if 8-bit is used
  - 1056 chars if UCS2 is used
- If message sending fails for some reason, then an error code is reported.

AT+CMGS=?

Test command returns the **OK** result code.

To avoid malfunctions it is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.

Not Subject to NDA

Set PDU mode

```
AT+CMGF=0
OK

AT+CMGS=18
> 08812801009901025911550781102090551 2F90000A704F4F29C0E
+CMGS: 124

OK
```

Set text mode

```
AT+CMGF=1
OK

AT+CSMP=17,167,0,0
OK

AT+CMGS="01090255219",129
>TEST MESSAGE
+CMGS:125

OK
```


Not Subject to NDA

3.6.17. AT+CMGC - Send SMS Command

The command is related to sending SMS command.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CMGC

Execution command sends command message from a TE to the network (SMS-COMMAND). It can have two syntax formats according to the SMS format: PDU or Text mode (see **+CMGF** command). If SMS command is successfully sent to the network, the result is shown with the following URC:

in PDU mode:

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

in text mode:

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

Additional info:

- In PDU mode, the **+CMGC** command has the following syntax:

  AT+CMGC=<length>

  After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

Not Subject to NDA

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

and waits for the specified number of bytes. the PDU shall be hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line.

To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<length>	integer	-	length of the actual TP data unit in octets. (Excluding the SMSC address octets).

▶▶ Message header and contents in PDU mode format. See description in Table:

Reference	Description	Length
<SCA>	Service Center address: 1 BYTE: length (number of followed octets). Mandatory 1 BYTE: <tosca> - value between 128-255	1, 3-12 BYTES (When length is 1, length BYTE = 0)
<FO>	First Octet. Bit/s | Reference | Description 0-1 | Message-Type-Indicator | Parameter describing the message type. 1 0 SMS-COMMAND (in the direction MS to SC)	1 BYTE

Not Subject to NDA

	5	TP-Status-Report-Request	Parameter indicating if a status report is requested by the MS 0 A status report is not requested 1 A status report is requested	
	6	TP-User-Data-Header-Indicator	Parameter indicating whether the beginning of the User Data field contains a Header in addition to the short message or contains only the short message 0 The TP-UD field contains only the short message 1 The beginning of the TP-UD field contains a Header in addition to the short message	
<TP-MR>	Message Reference. An integer representation of a reference number of the SM submitted to the SC by the MS. Values between 0-255.			1 BYTE
<TP-PID>	Protocol-Identifier. Values between 0-255.			1 BYTE
<TP-CT>	Command Type			1 BYTE

Not Subject to NDA

<TP-MN>	Message Number	1 BYTE
<TP-DA>	Destination address formatted according to the formatting rules of address fields.	2-12 BYTES
<TP-CDL>	Command data length	1 BYTE
<TP-CD>	Command data	0-156 BYTES

▶▶ In Text mode, the **+CMGC** command has the following syntax:

AT+CMGC=<fo>,<ct>[, <pid>[,<mn>[, <da>[,<toda>]]]]

After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<fo>	integer	-	First octet of 3GPP TS 23.040 SMS-COMMAND in integer format.
<ct>	integer	-	TP-Command-Type in integer format specified in 3GPP TS 23.040. Default value is 0.
<pid>	integer	0	TP-Protocol-Identifier in integer format. Value: 0÷255 : TP-Protocol-Identifier in integer format

Not Subject to NDA

<mn>	integer	-	TP-Message-Number in integer format.
<da>	string	-	TP-Destination-Address-Value field in string format represented in the currently selected character set (see **+CSCS**).
<toda>	integer	129	TP-Destination-Address Type-of-Address octet: Values: 129 : number in national format 145 : number in international format (contains the "+")

Unsolicited fields:

Name	Type	Description
<mr>	integer	TP-Message-Reference in integer format
<ackpdu>	string	RP-User-Data element of RP-ACK PDU (When **+CSMS** <**service**> value is 1 and network supports).
<scts>	string	TP-Service Centre Time Stamp in Time String Format. (When **+CSMS** <**service**> value is 1 and network supports).

The DCD signal shall be in ON state while data is entered. The echoing of data is controlled by echo command **E**.

In PDU mode: when the length of the SMSC address equals 0, then the SMSC address set with command **+CSCA** is used; in this case the SMSC Type of Address octet shall not be present in the data.

Not Subject to NDA

To ensure that during the command execution, which may take several seconds, no other SIM interacting commands issued, care must take.

If message sending fails for some reason, then an error code is reported.

AT+CMGC=?

Test command returns the **OK** result code.

To avoid malfunctions it is suggested to wait for the **+CMGC: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.

Not Subject to NDA

Set PDU mode

```
AT+CMGF=0
OK

AT+CMGC=15
> 07917952140230f202440002340C917952446585600100
+CMGC: 124

OK
```

Set text mode

```
AT+CMGF=1
OK

AT+CSMP=17,167,0,0
OK

AT+CMGS="01090255219",129
> Text Message is entered <CTRL-Z>
+CMGS:125

OK

AT+CMGC=2,1,0,125
> Text Message is entered <CTRL-Z>
OK
```


Not Subject to NDA

3.6.18. AT+CMSS - Send Message from Storage

This command sends to the network a message which is already stored in the <**memw**> storage.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<index>	string	-	location value in the message storage <**memw**> of the message to send
<da>	string	-	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>	integer	N/A	type of destination address For Verizon FW, the range of <**toda**> is 0 - 255.

Values:

129 : number in national format

145 : number in international format (contains the "+")

Additional info:

Not Subject to NDA

▶▶ If message is successfully sent to the network, then the result is sent in the format:

+CMSS: <mr>

Name	Type	Default	Description
<mr>	integer	-	message reference number

▶▶ If message sending fails for some reason, an error code is reported:

+CMS ERROR:<err>

To store a message in the <**memw**> storage see command **+CMGW**.

Care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.

AT+CMSS=?

Test command returns the **OK** result code.

To avoid malfunctions is suggested to wait for the **+CMSS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.

Not Subject to NDA

3.6.19. AT+CMGW - Write Short Message to Memory

The command is related to writing short messages.

3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CMGW

Execution command writes a new short message in the <**memw**> memory storage (see **+CPMS**). It can have two syntax formats according to the SMS format: PDU or Text mode (see **+CMGF** command). If short message is successfully written the following URC is displayed:

+CMGW: <index>

Additional info:

- In PDU mode the **+CMGW** command has the following syntax:

  AT+CMGW=<length>[,<stat>]

  After command line is terminated with <CR>, the module 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.

Not Subject to NDA

To write the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<length>	integer	N/A	length in bytes of the PDU to be written
	Value: 7÷164 : number of bytes		
<stat>	integer	N/A	message status
	Values: 0 : new message new message (received unread message; default for DELIVER messages (3GPP TS 23.040 SMS-DELIVER messages)) 1 : read message 2 : stored message not sent yet (default for SUBMIT messages (3GPP TS 23.040 SMS-SUBMIT messages)) 3 : stored message already sent		
<data>	hex	-	PDU bytes, given in online mode

▶▶ In Text mode the **+CMGW** command has the following syntax:

AT+CMGW[=<da>[,<toda>[,<stat>]]]

After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

Not Subject to NDA

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

After this prompt, you can enter text that should be formatted as follows:

- if current <dcs> (see +CSMP) indicates that GSM03.38/23.038 default alphabet is used and current <fo> (see +CSMP) indicates that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to 3GPP TS 27.005, Annex A; backspace can be used to delete last character and carriage returns can be used..

- if current <dcs> (see +CSMP) indicates that 8-bit or UCS2 data coding scheme is used or current <fo> (see +CSMP) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the 'asterisk' will be entered as 2A (IRA50 and IRA65) and this will be converted to an octet with integer value 0x2A)

The command 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).

Name	Type	Default	Description
<da>	string	-	destination address, string type represented in the currently selected character set (see +CSCS).
<toda>	integer	N/A	type of destination address For Verizon FW, the range of <toda> is 0 - 255.

Not Subject to NDA

Values:

129 : number in national format

145 : number in international format (contains the character "+")

<stat>	string	"STO UNSENT"	message status

Values:

"REC UNREAD" : new received message unread

"REC READ" : received message read

"STO UNSENT" : message stored not yet sent

"STO SENT" : message stored already sent

Unsolicited field:

Name	Type	Description
<index>	integer	message location index in the memory <**memw**> (see **+CPMS**). If message storing fails for some reason, an error code is reported.

The DCD signal shall be in **ON** state while <**data**> is entered. The echoing of <**data**> is controlled by echo command **E.**

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.

Not Subject to NDA

Care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.

It is possible to save a concatenation of at most 16 SMs; the maximum number of chars depends on <**dcs**>:

- 2432 chars
- 2128 chars if 8-bit is used
- 1056 chars if UCS2 is used

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 must 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".

If message writing fails for some reason, then an error code is reported.

AT+CMGW=?

Test command returns the **OK** result code.

To avoid malfunctions it is suggested to wait for the **+CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

Not Subject to NDA

set PDU mode

```
AT+CMGF=0
OK

AT+CMGW=18
> 08812801009901025911550781102090551 2F90000A704F4F29C0E
+CMGW: 29

OK
```

set text mode

```
AT+CMGF=1
OK

AT+CSMP=17,167,0,0
OK

AT+CSCA="821029190903",145
OK

AT+CMGW="0165872928"
> test message...
+CMGW: 28

OK
```


Not Subject to NDA

3.6.20. AT+CMGD - Delete Message

This command allows to delete from memory messages.

3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CMGD=<index>[,<delflag>]

Execution command deletes SMS message(s) from a selected memory storage. Storage is selected by command **+CPMS**.

Parameters:

Name	Type	Default	Description
<index>	integer	-	Message index in the selected storage; it can have values from 1 to N, where N depends on the available space in the selected storage (see **+CPMS**)
<delflag>	integer	0	Type of multiple message deletion Values: 0 : delete message specified in <index> 1 : delete all read messages from selected storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched 2 : delete all read messages from selected storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched

Not Subject to NDA

3 : delete all read messages from selected storage, sent and unsent mobile originated messages, leaving unread messages untouched

4 : delete all messages from selected storage.

If <delflag> is present and not set to 0 then, if <index> is greater than 0, <index> is ignored and the command follows the rules for <delflag> shown above.

In case of Verizon FW, delete an empty slot with specified <index> will return **+CMS ERROR: 321** or **ERROR**.

AT+CMGD=?

Test command shows the valid memory locations <index> and the supported values of <delflag>.

```
AT+CMGD=?
+CMGD: (1,2,3,6,7,17,18,19,20,37,38,39,47),(0-4)
OK
```


Not Subject to NDA

3.6.21. AT#SMSMODE - SMS Commands Operation Mode

SMS Commands Operation Mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SMSMODE=<mode>

Set command enables/disables the check for presence of SMS Service Centre Address (SCA) in the Fixed Dialing Number (FDN) phonebook.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	Enables/disables the check for presence of SCA in FDN phonebook.

Values:

1 : Disables the check for presence of SCA in FDN phonebook.

2 : Enables the check for presence of SMS SCA in the FDN phonebook when FDN are enabled. If the SMS SCA is not present a SMS cannot be sent.

AT#SMSMODE?

Read command reports whether the check of SMS SCA in FDN phonebook is enabled or not, in the format:

#SMSMODE: <mode>

AT#SMSMODE=?

Not Subject to NDA

Test command reports the range of <**mode**> parameter values.

Not Subject to NDA

3.6.22. AT#CMGS - Send Short Message

This command sends a short message.

3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CMGS=<param1>,<param2>

Execution command sends a short message to the network. <**param1**> and <**param2**> assume different meanings according to the used SMS format.

If message is successfully sent, then the result is shown with the following URC:

#CMGS: <mr>

<**mr**> parameter is described in Unsolicited fields section.

Parameters:

Name	Type	Default	Description
<param1>	mixed	-	The meaning of this parameter depends on the SMS format (PDU or Text mode) selected by **+CMGF**.
<param2>	mixed	-	The meaning of this parameter depends on the SMS format (PDU or Text mode) selected by **+CMGF**.

Additional info:

- In case of PDU mode the parameters meaning is the following:

Not Subject to NDA

Name	Type	Default	Description
<param1>	integer	N/A	length in bytes of the PDU to be sent (excluding the SMSC address octets) Value: 7÷164 : number of bytes
<param2>	hex	-	PDU bytes

▶▶ In case of Text mode the parameters meaning is the following:

Name	Type	Default	Description
<param1>	string	-	destination address
<param2>	string	-	text to send

Unsolicited field:

Name	Type	Description
<mr>	integer	TP-Message-Reference number as per 3GPP TS 23.040

in PDU mode: when the length of the SMSC address equals 0, then the SMSC address set with command **+CSCA** is used; in this case the SMSC Type Of Address octet shall not be present in the <param2>.

In Text mode, the text entered with <param2> should be enclosed between double quotes and formatted as follows:

- if current <dcs> (see **+CSMP**) indicates that 3GPP TS 23.038 default alphabet is used and current <fo> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-DataHeader-Indication is not set,

Not Subject to NDA

then the 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 and current <**fo**> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-DataHeader-Indication is set, then 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 (IRA 50 and IRA 65) and this will be converted to an octet with integer value 0x2A).

If message sending fails for some reason, then an error code is reported.

AT#CMGS=?

Test command returns the **OK** result code.

To avoid malfunctions it is suggested to wait for the **#CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.

The command maximum length is 560 including the AT command itself. For example: **AT#CMGS="1234567","SMS text"** the length is 28.

Not Subject to NDA

3.6.23. AT#CMGW - Write Short Message To Memory

This command writes a new short message.

3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CMGW=<param1>,<param2>

Execution command writes a new short message in the **<memw>** memory storage (see **+CPMS**). <**param1**> and <**param2**> assume different meanings according to the used SMS format.

If message is successfully written in the memory, then the result is shown with the following URC:

#CMGW: <index>

<**index**> parameter is described in Unsolicited fields section.

Parameters:

Name	Type	Default	Description
<param1>	mixed	-	The meaning of this parameter depends on the SMS format selected (PDU or Text mode) by **+CMGF**.
<param2>	string	-	The meaning of this parameter depends on the SMS format selected (PDU or Text mode) by **+CMGF**.

Additional info:

- In case of PDU mode the parameters meaning is the following:

Not Subject to NDA

Name	Type	Default	Description
<param1>	integer	N/A	length in bytes of the PDU to be written Value: 7÷164 : number of bytes
<param2>	hex	-	PDU bytes

▶▶ In case of Text mode the parameters meaning is the following:

Name	Type	Default	Description
<param1>	string	-	destination address
<param2>	string	-	text to write

Unsolicited field:

Name	Type	Description
<index>	integer	message location index in the memory <**memw**> (see **+CPMS**)

Not Subject to NDA

In Text mode, the text entered with <**param2**> should be enclosed between double quotes and formatted as follows:

- if current <**dcs**> (see **+CSMP**) indicates that 3GPP TS 23.038 default alphabet is used and current <**fo**> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-DataHeader-Indication is not set, then the 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 and current <**fo**> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-DataHeader-Indication is set, then 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 (IRA 50 and IRA 65) and this will be converted to an octet with integer value 0x2A).

If message storing fails for some reason, then an error code is reported.

AT#CMGW=?

Test command returns the **OK** result code.

To avoid malfunctions it is suggested to wait for the **#CMGW: <index>** or **+CMS ERROR: <err>** response before issuing further commands.

The command maximum length is 560 including the AT command itself. For example: **AT#CMGW="1234567","SMS text"** the length is 28.

Not Subject to NDA

3.6.24. AT#CMGLCONCINDEX - Report Concatenated SMS Indexes

The command reports list of all concatenated SMS

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CMGLCONCINDEX

The command reports a line for each concatenated SMS containing:

#CMGLCONCINDEX: <N>,<i>,<j>,<k>,...

If no concatenated SMS is present on the SIM, only **OK** result code will be returned.

The parameters are described in the Additional info section.

Additional info:

▸▸ Here is the meaning of the parameters returned by the command.

Name	Type	Default	Description
<N>	integer	-	Number of segments that form the whole concatenated SMS.
<i>	integer	-	index of the first SMS segment. 0 if segment has not been received.
<j>	integer	-	index of the second SMS segment. 0 if segment has not been received.
<k>	integer	-	index of the third SMS segment 0 if segment has not been received

Not Subject to NDA

<...>	integer	-	index of the next SMS segment ...

AT#CMGLCONCINDEX=?

Test command returns **OK** result code.

Example of 2 concatenated SMS:

First composed by 3 segments: 1,2,3, but segment 0 not received yet.

Secondo composed by segments: 4,5,6,7,8, but segment 7 not received yet.

```
AT#CMGLCONCINDEX
#CMGLCONCINDEX: 3,0,2,3
#CMGLCONCINDEX: 5,4,5,6,0,8
OK
```


Not Subject to NDA

3.6.25. AT#E2SMSRI - SMS Ring Indicator

This set command enables/disables the Ring Indicator pin response to an incoming SMS message. If enabled, a negative going pulse is generated when receiving an incoming SMS message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Common profile	No	-	2

AT#E2SMSRI=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	RI enabling

Values:

0 : disables RI pin response for incoming SMS messages

50÷1150 : enables RI pin response for incoming SMS. The value of <n> is the duration in ms of the pulse generated on receipt of an incoming SMS.

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 SMS, in the format:

Not Subject to NDA

#E2SMSRI: <n>

<n>=0 means that the RI pin response to an incoming SMS is disabled

AT#E2SMSRI=?

Reports the range of supported values for parameter **<n>**

Not Subject to NDA

3.6.26. AT#SMOV - SMS Overflow

The command is used to enable the SMS overflow signaling functionality.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT#SMOV=[<mode>]

Set command enables the SMS overflow signaling function. If enabled, URC code is:

#SMOV: <memo>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	signaling functionality mode Values: 0 : disables SMS overflow signaling function 1 : enables SMS overflow signaling function

Unsolicited field:

Name	Type	Description
<memo>	string	the SMS storage that has reached the maximum capacity Values: "SM" : SIM Memory "ME" : NVM SMS Storage

Not Subject to NDA

When the maximum storage capacity has been reached, if enabled, a network-initiated notification is sent.

AT#SMOV?

Read command reports whether the SMS overflow signaling function is currently enabled or not, in the format:

#SMOV: <mode>

AT#SMOV=?

Test command returns the supported range of values of parameter **<mode>**.

Not Subject to NDA

3.6.27. AT#SMSMOVE - Move Short Message to other Memory

This command moves selected Short Message from current memory to destination memory.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SMSMOVE=<index>

Execution command moves selected Short Message from current memory to destination memory.

Parameter:

Name	Type	Default	Description
<index>	string	-	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**.

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>

Additional info:

Parameters:

Not Subject to NDA

Name	Type	Default	Description
<curr_mem>	string	N/A	current memory, selected by **+CPMS** command Values: SM : SIM SMS memory storage ME : NVM SMS storage
<used_curr_mem>	integer	-	number of SMs stored in the current memory
<total_curr_mem>	integer	-	max number of SMs that the current memory can contain
<dest_mem>	string	SM	destination memory Values: SM : SIM memory ME : device memory
<used_dest_mem>	integer	-	number of SMs stored in the destination memory
<total_dest_mem>	integer	-	max number of SMs that the destination memory can contain

AT#SMSMOVE=?

Test command reports the supported values for parameter <**index**>.

Not Subject to NDA

AT#SMSMOVE?

#SMSMOVE: "ME",3,100,"SM",0,50

OK

The current memory is ME where 3 SMs are stored; the destination memory is SIM that is empty

AT+CMGL=ALL

+CMGL: 1,"STO UNSENT","32XXXXXXXX","",

Test 1

+CMGL: 2,"STO UNSENT","32XXXXXXXX","",

Test 2

+CMGL: 3,"STO UNSENT","32XXXXXXXX","",

Test 3

OK

List the SMs to discover the memory index

AT#SMSMOVE=1

OK

Move the SM in the first position of ME to SIM

AT#SMSMOVE?

#SMSMOVE: "ME",2,100,"SM",1,50

OK

Now we have 2 SMs in ME and 1 in SIM

Not Subject to NDA

3.6.28. AT#SMSUCS - SMS Un-Change Status

Set commands to keep the SMS status.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SMSUCS=<mode>

Set command allows to keep the SMS Status to UNREAD after **+CMGR** or **+CMGL**.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Change/Not Change the SMS status Values: 0 : The SMS Status will change. 1 : The SMS Status will not change.

AT#SMSUCS?

Read command returns the current value of the <**mode**> parameter.

AT#SMSUCS=?

Test command returns the supported values for parameter <**mode**>.

Not Subject to NDA

```
AT#SMSUCS?
#SMSUCS: 1

OK

AT+CMGR=1
+CMGR: "REC UNREAD","+393333075581","","08/07/07,10:48:44+36"
TEST MESSAGE.

OK

AT+CMGR=1
+CMGR: "REC UNREAD","+393333075581","","08/07/07,10:48:44+36"
TEST MESSAGE.

OK
```


Not Subject to NDA

3.6.29. AT#ISMSCFG - SMS Transport Configuration

This command changes the configuration parameter for outgoing SMS.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ISMSCFG=<mode>

Set command changes the configuration parameter for outgoing SMS, which will be used to route the SMS either over CPS or over IMS (IP Multimedia Core Network Subsystem).

Parameter:

Name	Type	Default	Description
<mode>	integer	1	configuration parameter for outgoing SMS.

Values:

0 : SMS service is not to be invoked over the IP networks

1 : SMS service is preferred to be invoked over the IP networks

Default value for ATT FW(NA, SA, NF-ATT), SoftBank and Vodafone NZ FW is '0' and for the others is '1'.

Device reboot is needed all the time after changing <mode> value.

The current setting is stored in NVM.

AT#ISMSCFG?

Read command returns the current domain selected to route the outgoing SMS in the format:

Not Subject to NDA

#ISMSCFG: <mode>

AT#ISMSCFG=?

Test command returns the supported range of values for parameter <**mode**>, in the format:

#ISMSCFG: (list of supported <**mode**>s)

Not Subject to NDA

3.7. Time & Alarm

3.7.1. AT+CCLK - Clock Management

The command is related to real time clock management.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+CCLK=<time>

Set command sets the real-time clock of the module.

Parameter:

Name	Type	Default	Description
<time>	string	N/A	Current time as quoted string in the format: **"yy/MM/dd,hh:mm:ss±zz"**

Values:

yy : year (two last digits are mandatory), range is 00..99

MM : month (two digits are mandatory), range is 01..12

dd : day (two 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 message.

hh : hour (two digits are mandatory), range is 00..23

mm : minute (two digits are mandatory), range is 00..59

Not Subject to NDA

ss	:	seconds (two 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 digits are mandatory), range is -96...+96

AT+CCLK?

Read command returns the current setting **<time>** of the real-time clock, in the format:

+CCLK: <time>

The three last characters of <**time**>, i.e. the time zone information, are returned by **AT+CCLK?** only if the **#NITZ** URC *'extended'* format has been enabled (see **#NITZ**).

AT+CCLK=?

Test command returns the **OK** result code.

Set date and time:
AT+CCLK="02/09/07,22:30:00+00"
OK

Read date and time:
AT+CCLK?
+CCLK: "02/09/07,22:30:25"
OK

Not Subject to NDA

3.7.2. AT+CALA - Alarm Management

This command is related to the alarm management.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+CALA=<time>[,<n>[,<type>[,<text>[,<recurr>[,<silent>]]]]]

Set command stores in the internal Real Time Clock of the module an alarm time with respective settings.

It is possible to set up a recurrent alarm for one or more days in the week.

5. Currently just one alarm can be set.
6. Alarms are not supported after disconnecting from power. Coin cell are supported. In case of a power cut, alarm will be deleted and needs to be re-set.

When the RTC time reaches the alarm time then the alarm starts, the behavior of the module depends on the setting **<type>** and if the module was already ON at the moment when the alarm time had come.

Parameters:

Name	Type	Default	Description
<time>	string	-	current alarm time as quoted string in the format: **"yy/MM/dd,hh:mm:ss±zz"** Refer to **+CCLK** for the string meaning. Empty string (**+CALA=""**) deletes the current alarm and resets all the **+CALA**

Not Subject to NDA

			parameters to the factory default configuration. "hh:mm:ss±zz" string must be used only when issuing +CALA with parameter <recurr>.
<n>	integer	0	index of the alarm Value: 0 : the only value supported
<type>	integer	1	alarm behavior type Values: 0 : reserved 1 : the module wakes up fully operative as if the ON/OFF button has been pressed. If the module is already ON when the alarm times out, then it does nothing. 2÷8 : see Additional info section.
<text>	string	-	alarm code text string used in the URC +CALA. It has meaning only if <type> is equal to 2, 5 or 6.
<recurr>	string	N/A	sets a recurrent alarm for one or more days in the week in the following format: "X[,Y[,...]]" where X, Y, ... can assume the following values: Values: 0 : all days in the week 1 : Monday 2 : Tuesday

Not Subject to NDA

3 : Wednesday

4 : Thursday

5 : Friday

6 : Saturday

7 : Sunday

<silent>	integer	N/A	indicates if the alarm is silent or not

Values:

0 : the alarm is not silent

1 : the alarm is silent

Additional info:

- **<type>=2**

  The module wakes up in "alarm mode" if at the alarm time it was powered OFF, otherwise it remains fully operative. In both cases the module issues an unsolicited code every 3 s:

  +CALA: <text>

  Where **<text>** is the **+CALA** optional parameter previously set.

  The module keeps on sending the unsolicited code every 3 s until a **#WAKE** or **#SHDN** command is received or a 90 seconds timer expires. If the module is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down.

- **<type>=3**

  The module wakes up in "alarm mode" if at the alarm time it was powered 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**).

Not Subject to NDA

The module keeps on playing the alarm tone until a **#WAKE** or **#SHDN** command is received or a 90 s time-out occurs. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down.

If alarm expires during a call alarm sound will stop when the call is disconnected.

- **<type>=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 alarm pin high, provided that one has been set (using **#ALARMPIN** or **#GPIO**) and keeps it in this state until a **#WAKE** or **#SHDN** command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the **#WAKE** command within 90s then it shuts down.

- **<type>=5**

  The module will make both the actions as for **<type>=2** and **<type>=3**.

- **<type>=6**

  The module will make both the actions as for **<type>=2** and **<type>=4**.

- **<type>=7**

  The module will make both the actions as for **<type>=3** and **<type>=4**.

- **<type>=8**

Not Subject to NDA

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.

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

During the "alarm mode" the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SMS.

The only commands that can be issued to the module in this state are the **#WAKE** and **#SHDN**, every other command must not be issued during this state.

AT+CALA?

Read command returns the list of current active alarm settings in the device, in the following format:

[+CALA: <time>,<n>,<type>,[<text>],<recurr>,<silent>]

Note: on READ command <time> does not include the time zone.

AT+CALA=?

Test command returns the list of supported index values, alarm types, maximum length of the text to be displayed in the URC **+CALA**, maximum length of <**recurr**> and supported <**silent**>s, in the format:

Not Subject to NDA

+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>,<rlength>,(list of supported <silent>s)

Additional info:

- Parameters:

Name	Type	Default	Description
<tlength>	string	-	maximum length of **<text>** parameter
<rlength>	string	-	maximum length of **<recurr>** parameter

```
AT+CALA="02/09/07,23:30:00+00"
OK
```


Not Subject to NDA

3.7.3. AT+CSDF - Setting Date Format

This command sets the date format of the date information presented to the user.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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 has no effect on our device.

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 **+CCLK**).

Parameters:

Name	Type	Default	Description
<mode>	integer	1	phone display data format. Values: 1 : DD-MMM-YYYY 2 : DD-MM-YY 3 : MM/DD/YY 4 : DD/MM/YY 5 : DD.MM.YY 6 : YYMMDD 7 : YY-MM-DD

Not Subject to NDA

<auxmode>	integer	1	TE-TA interface data format. Values: 1 : yy/MM/dd 2 : yyyy/MM/dd

The **<time>** format of **+CCLK** and **+CALA** is:

7. "yy/MM/dd,hh:mm:ss+zz" when **<auxmode>**=1
8. "yyyy/MM/dd,hh:mm:ss+zz" when **<auxmode>**=2

If the parameters are omitted (**AT+CSDF=**), then this command sets the default value of **<mode>**.

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>**.

Not Subject to NDA

- AT+CSDF?
  +CSDF: 1,1
  OK

  AT+CCLK?
  +CCLK: "00/01/02,03:42:08+00"
  OK

- AT+CSDF=1,2
  OK

  AT+CCLK?
  +CCLK: "2000/01/02,03:42:23+00"
  OK

Not Subject to NDA

3.7.4. AT+CTZR - Time Zone Reporting

This command enables and disables the time zone change event reporting.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CTZR=<onoff>

Set command permits to enable/disable the time zone change event reporting.

If the reporting is enabled and whenever the time zone is changed, the MT returns the unsolicited result code:

+CTZV: <tz>

Parameter:

Name	Type	Default	Description
<onoff>	string	0	enable/disable the time zone change event reporting. Values: 0 : Disable time zone change event reporting 1 : Enable time zone change event reporting

Unsolicited field:

Name	Type	Description
<tz>	string	New time zone.

AT+CTZR?

Read command reports the currently selected **<onoff>** in the format:

Not Subject to NDA

+CTZR: <onoff>

AT+CTZR=?

Test command reports the supported range of values for parameter **<onoff>**

Not Subject to NDA

3.7.5. AT+CTZU - Automatic Time Zone Update

Set command enables/disables the automatic time zone update via NITZ.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CTZU=<onoff>

Parameter:

Name	Type	Default	Description
<onoff>	integer	0	enables/disables the automatic time zone update via NITZ Values: 0 : disable 1 : enable

The command **+CTZU** is the ETSI standard equivalent of Telit custom command **#NITZ** (for the date and time update functionality).

Despite of the name, the command **+CTZU** enables automatic update of the date and time set by **+CCLK** command (not only time zone). This happens when a Network Identity and Time Zone (NITZ) message is sent by the network.

If the automatic date and time update functionality has been enabled by **+CTZU** or **#NITZ** (or both), NITZ message will cause a date and time update.

Not Subject to NDA

AT+CTZU?

Read command reports the current setting of <**onoff**> in the format:

+CTZU: <onoff>

AT+CTZU=?

Test command returns the supported values of parameter <**onoff**>.

Not Subject to NDA

3.7.6. AT#CCLK - Clock Management

The command is related to real time clock management.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CCLK=<time>

Set command sets the real-time clock of the module.

Parameter:

Name	Type	Default	Description
<time>	string	N/A	Current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz,d"

Values:

- yy : year (two last digits are mandatory), range is 00..99
- MM : month (two digits are mandatory), range is 01..12
- dd : day (two 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 message.
- hh : hour (two digits are mandatory), range is 00..23
- mm : minute (two digits are mandatory), range is 00..59
- ss : seconds (two 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 digits are mandatory), range is: -96..+96

Not Subject to NDA

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>.

If the time is set by the network but the Daylight-Saving Time (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.

Set command:
AT#CCLK="02/09/07,22:30:00+04,1"
OK

Read command:
AT#CCLK?
#CCLK: "02/09/07,22:30:25+04,1"
OK

Not Subject to NDA

3.7.7. AT#CCLKMODE - Clock Mode

This command allows to enable the local time or the UTC time.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CCLKMODE=<mode>

Set command enables the local time or the UTC time in **+CCLK** and **#CCLK** commands and in **#NITZ** URC

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Time and date mode
			Values:
			0 : Local time + local time zone offset
			1 : UTC time + local time zone offset

AT#CCLKMODE?

Read command reports whether the local time or the UTC time is enabled, in the
format:

#CCLKMODE: <mode>

AT#CCLKMODE=?

Test command reports the supported range of values for parameter **<mode>**

Not Subject to NDA

Example of the two clock mode settings:

```
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
```


Not Subject to NDA

3.7.8. AT#CLKSRC - Set Time Clock Source

This command selects the source time clock.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#CLKSRC=<src>

Set command selects the source time clock for the system between NITZ, GNSS or a combination between.

Parameter:

Name	Type	Default	Description
<src>	integer	0	sets the clock source

Values:

0 : NITZ time only

1 : GNSS time only

2 : GNSS time priority

3 : NITZ time priority

4 : DISABLE. With this value, clock source shall not be update not by NITZ nor by GNSS. The only possibility to set it is by manual setting.

AT#CLKSRC?

Read command reports the current clock source configuration.

#CLKSRC: <src>,<curr>

<src> - see description above.

Not Subject to NDA

<curr> - the current source of time as displayed by +cclk command.
Values are:

0 - INVALID. Time wasn't yet updated through NITZ, GNSS or Manual.

1 - NITZ source.

2 - GNSS source.

3 - Manual source.

AT#CLKSRC=?

Test command reports the supported range of values for parameter <src>.

- The setting is saved automatically in NVM.
- Setting time manually is possible to all values of <src>, but in values of '0', '1', '2' and '3' time shall be override when NITZ or GNSS arrives according to the rule that is defined to that value.

Not Subject to NDA

3.7.9. AT#WAKE - Wake from Alarm Mode

Stop any alarm activity

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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:

Name	Type	Default	Description
<opmode>	integer	0	operating mode

Value:

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

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>

Not Subject to NDA

0 - normal operating mode
1 - alarm mode or normal operating mode with some alarm activity.

AT#WAKE=?

Test command returns **OK** result code.

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.

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.

Not Subject to NDA

3.7.10. AT+CSTF - Setting Time Format

Set command sets the time format of the time information presented to the user.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CSTF=[<mode>]

Set command sets the time format of the time information presented to the user.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	phone display time format, The default value is manufacturer specific.

Values:

1 : HH:MM (24 hour clock)

2 : HH:MM a.m./p.m.

3÷7 : Manufacturer specific

AT+CSTF?

Read command reports the currently selected <**mode**> in the format: **+CSTF:** <**mode**>.

AT+CSTF=?

Not Subject to NDA

Test command reads the supported **<mode>**s as a compound value.

+CSTF: (list of supported <mode>s)

Not Subject to NDA

3.7.11. AT+CALD - Delete Alarm

This command deletes an alarm in the ME.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CALD=<n>

Execution command deletes an alarm in the ME.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	alarm index
	Value:		
	0 : alarm index		

AT+CALD=?

Test command reports the range of supported values for <n> parameter.

Not Subject to NDA

3.7.12. AT#NITZ - Network Identity and Time Zone

This command handles Network Identity and Time Zone.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#NITZ=[<val>[,<mode>]]

Set command enables/disables the automatic date/time updating and the Full Network Name applying. It enables also the **#NITZ** URC in the format:

#NITZ: <datetime>

and permits to change its format.

Parameters:

Name	Type	Default	Description
<val>	integer	7	identifies the functionalities to enable. The <**val**> parameter is a sum of integer values, where every value corresponds to a functionality: 1 - enables automatic date/time updating 2 - enables Full Network Name applying 4 - sets the **#NITZ** URC 'extended' format (see <**datetime**> below) 8 - sets the **#NITZ** URC 'extended' format with Daylight Saving Time (DST) support (see <**datetime**> below)

Values:

0 : disables every functionality

1÷15 : sum of integer values

Not Subject to NDA

<mode>	integer	0	enables/disables the **#NITZ** URC

Values:

0 : disables the URC

1 : enables the URC

Unsolicited field:

Name	Type	Description
<datetime>	string	string format depends on parameter <**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)
		For the meaning of the <**datetime**> subfields, please check **+CCLK** and **#CCLK** commands

If the DST information isn't sent by the network, then the <**datetime**> parameter will have the format **"yy/MM/dd,hh:mm:ss±zz"**.

Date and time information can be sent by the network after GSM registration or after PS attach.

AT#NITZ?

Read command reports whether

1. automatic date/time updating
2. Full Network Name applying
3. **#NITZ** URC (as well as its format)

Not Subject to NDA

are currently enabled or not in the format:

#NITZ: <val>,<mode>

AT#NITZ=?

Test command returns supported values of parameters <**val**> and <**mode**>.

Not Subject to NDA

3.8. WLAN

3.8.1. AT#WLANSTART - Enable/disable WLAN

This command is used to enable/disable WLAN.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANSTART=<mode>[,<cid>[,<ip_family>]]

Set command is used to enable/disable WLAN.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	Status mode Values: 0 : Disable 1 : Enable 2 : Auto enable with start
<cid>	integer	N/A	(PDP Context Identifier) numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command). Value: 1÷max : The value of max is returned by the Test command.
<ip_family>	integer	N/A	IP family Values: 4 : ipv4

Not Subject to NDA

4. Enable WLAN will start it as access point mode by default unless configure prior to start (**AT#WLANMODE**).
5. In case of starting WLAN with no network (no SIM card, **+CFUN**=4, ...) WLAN will start without internet access and it will return **+CME ERROR: No Internet Access** if set **AT#WLANSTART=1.** For the case of setting **AT#WLANSTART=2**, even starting WLAN without network, **OK** response will be returned, and the WLAN data connection will be regained whenever the network is successfully registered.

AT#WLANSTART?

Read command returns the current WLAN status in the format:

#WLANSTART: <mode>,<cid>

Where:

<mode>
0 - WLAN OFF
1 - WLAN ON
2 - WLAN ON and auto start

<cid> - as <cid> before

AT#WLANSTART=?

Test command reports supported range of values for all parameters.

Not Subject to NDA

3.8.2. AT#WLANBROADCAST - Enable/disable broadcast

This command is used to enable/disable broadcast.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANBROADCAST=<mode>

Set command is used to enable/disable broadcast.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Status mode Values: 0 : Enable broadcast 1 : Disable broadcast

AT#WLANBROADCAST?

Read command returns the current broadcast status in the format:

#WLANBROADCAST: <mode>

Where:

<mode>

0 - Enable broadcast

1 - Disable broadcast

AT#WLANBROADCAST=?

Not Subject to NDA

Test command returns the supported range of values for parameter **<mode>**.

Not Subject to NDA

3.8.3. AT#WLANSSID - Change SSID name

This command is used to change the SSID name.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANSSID=<ssid>

Set command is used to change the SSID name.

Parameter:

Name	Type	Default	Description
<ssid>	string	-	SSID

The **<ssid>** length must be of 32 characters or less.

AT#WLANSSID?

Read command returns the current SSID in the format:

#WLANSSID: <ssid>

AT#WLANSSID=?

Test command returns **OK** result code.

Not Subject to NDA

3.8.4. AT#WLANMODE - Change WLAN mode

This command is used to change the WLAN mode (AP/STA/AP+STA/AP+AP).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANMODE=[<mode>]

Set command is used to change the WLAN mode (AP/STA/AP+STA/AP+AP).

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Status mode
	Values: 0 : Access point mode 1 : STA mode 2 : AP+STA mode 3 : AP+AP mode		

If #ETHMODE is set to 1 and ethernet is activated, this command should not be set as STA mode or AP+STA mode.

AT#WLANMODE?

Read command returns the current mode status in the format:

#WLANMODE: <mode>

Where:

Not Subject to NDA

<mode>

0 - Access point mode

1 - STA mode

2 - AP+STA mode

3 - AP+AP mode

AT#WLANMODE=?

Test command returns the supported range of values for parameter **<mode>**.

Not Subject to NDA

3.8.5. AT#WLANIP - Return assigned IP address

This command returns the assigned IP address.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANIP

Executing this command returns the assigned IP address.

AT#WLANIP=?

Test command returns **OK**.

Not Subject to NDA

3.8.6. AT#WLANSIGNAL - Return signal strength of the network

This command returns the signal strength of the connected network.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANSIGNAL

Executing this command returns the signal strength of the connected network.

AT#WLANSIGNAL=?

Test command returns **OK**.

Not Subject to NDA

3.8.7. AT#WLANSCAN - Scanning wifi networks

This command is used for scanning Wi-Fi networks.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANSCAN=[<mode>]

Set command for client mode only for scanning for Wi-Fi networks.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Mode Values: 0 : Normal result 1 : Extend result

AT#WLANSCAN=?

Test command returns the supported range of values for parameter **<mode>**.

Not Subject to NDA

3.8.8. AT#WLANCONNECT - Connect to SSID

This command is used to connect to a given SSID.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANCONNECT=<ssid>[,<security>,<key>]

Set command for client mode only, to connect to a given SSID.

Parameters:

Name	Type	Default	Description
<ssid>	string	-	SSID
<security>	integer	N/A	security
	Values: 0 : WEP 1 : WPAX 2 : WPA2-EAP 3 : WPA3 SAE		
<key>	string	-	key

The **<key>** length must be of 32 characters or less.

For security type WPA2, <key> parameter is not used

AT#WLANCONNECT?

Read command returns the SSID to which it connects into the format:

Not Subject to NDA

#WLANCONNECT: <ssid>

AT#WLANCONNECT=?

Test command reports supported values for the parameter **<security>**

#WLANCONNECT: (0-1)

Not Subject to NDA

3.8.9. AT#WLANDISCONNECT - Disconnect from the network

This command is used to disconnect the network.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANDISCONNECT

Execution command will disconnect from the network. Relevant for client mode only.

AT#WLANDISCONNECT=?

Test command returns **OK** result code.

Not Subject to NDA

3.8.10. AT#WLANCONFIG - Add or change the hostapd.conf

This command is used to add hostapd.conf file.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#WLANCONFIG=<size>

Set command allows to add or change the hostapd.conf.

Hostapd configuration file controls many options with regards to AP mode only, in which not all are supported by the current WIFI chip.

Parameter:

Name	Type	Default	Description
<size>	integer	-	File size

AT#WLANCONFIG=?

Test command returns **OK** result code.

Not Subject to NDA

3.8.11. AT#WLANSECURITY - Add hostapd.conf file.

This command allows changing WLAN security parameters. Relevant for AP mode only

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANSECURITY=<wpa>[,<key_mgmt>,<pairwise>,<key>]

Set command allows changing WLAN security parameters. Relevant for AP mode only.

Parameters:

Name	Type	Default	Description
<wpa>	integer	N/A	Security type Values: 0 : Disable 1 : WPA1 2 : WPA2 3 : WPA1 + WPA2 4 : WPA3
<key_mgmt>	integer	N/A	Security type Values: 0 : WPA-PSK 1 : WPA3-SAE
<pairwise>	integer	N/A	This controls wpa's data encryption. Values: 0 : TKIP

Not Subject to NDA

1 : CCMP

2 : TKIP and CCMP

<key>	string	-	The network's password.

For both security type wpa/wpa2/wpa3, **<key>** length must be of 32 characters or less.

AT#WLANSECURITY?

Read command reports the current value of the parameters.

AT#WLANSECURITY=?

Test command returns the supported range of values for parameters **<wpa>**,**<key_mgmt>**,**<pairwise>**,**<key>** in the format:

#WLANSECURITY: (0-4),(0-2),(0-2),""

Not Subject to NDA

3.8.12. AT#WLANEAPCFG - Configure WPA2-EAP settings

Configure WPA2-EAP settings

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANEAPCFG=<method>[,<identity>,<password>,<priv_key_password>]

Set command for configuring the EAP method and associated parameters.

Parameters:

Name	Type	Default	Description
<method>	integer	0	WPA2-EAP method used. Values: 0 : PEAPV0-MSCHAPV2 1 : PEAPV1-GTC 2 : TTLS-MSCHAPV2 3 : TTLS-GTC 4 : TLS
<identity>	string	-	Identifier/Domain name required for EAP server authentication.
<password>	string	-	Password for authentication with EAP server.
<priv_key_password>	string	-	Password for client private key used for TLS method.

Not Subject to NDA

The **<identity>,<password>,<private_key_password>** parameters have a maximum length of 64 characters.

AT#WLANEAPCFG?

Read command returns the WPA2-EAP method and identifier name configured, in the format:

 # WLANEAPCFG: <method>,<identity>

AT#WLANEAPCFG=?

Test command reports supported values for the parameter.

#WLANEAPCFG: (0-4),"indentity@domain.com","password","priv_key_passwd"

Not Subject to NDA

3.8.13. AT#WLANEAPCERT - Store WLAN EAP Certificates

Store WLAN EAP Certificates

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANEAPCERT=<cert_type>,<size>

Set command to store certificate files (CA Certificate, Client Certificate, and Client Private key) required for WPA2-EAP methods, into NVM.

Parameters:

Name	Type	Default	Description
<cert_type>	integer	0	Certificate type to be stored. Values: 0 : CA certificate from EAP server 1 : Client certificate for TLS method 2 : Client private key file for TLS
<size>	integer	-	Size of certificate to be loaded. 1..8192

Certificate file data should be in PEM format.

To complete the certificate store operation, send Ctrl-Z char (0x1A hex) to exit without writing the file data send ESC char (0x1B hex).

If the #WLANEAPCERT command is issued again, same certificate file will be overwritten with latest command input.

AT#WLANEAPCERT?

Read command returns error.

Not Subject to NDA

AT#WLANEAPCERT=?

Test command returns the supported values for the parameter.

#WLANEAPCERT: (0-1)

Not Subject to NDA

3.8.14. AT#WLANCFGERROR - Display last error in detailed form

This command displays the error of hostapd.conf file in detailed form.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANCFGERROR

Execution command will display the last error in detailed form.

AT#WLANCFGERROR=?

Test command returns **OK** result code.

Not Subject to NDA

3.8.15. AT#WLANINDI - Enable/disable WLAN unsolicited message

This command is used to enable/disable WLAN unsolicited message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANINDI=<state>

Set command is used to enable/disable WLAN unsolicited message.

Parameter:

Name	Type	Default	Description
<state>	integer	0	Status mode
	Values: 0 : Disable (factory default) 1 : Enable		

Need to be saved on profiles.

AT#WLANINDI?

Read command returns the current WLAN status in the format:

#WLANINDI: <state>

Where:

<state>
0 - OFF
1 - ON

Not Subject to NDA

AT#WLANINDI=?

Test command returns the supported range of values for parameter **<state>**.

Not Subject to NDA

3.8.16. AT#ISEL - Send command via cellular modem or Linux processor

This command directs the WE866Cx Connection Manager to send command via cellular modem or Linux processor.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ISEL=<mode>

Set command directs the WE866Cx Connection Manager to send AT commands and data either via a cellular modem or a Linux processor.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Mode

Values:

0 : Executes the AT commands and transmit the data via Cellular modem processor

1 : Executes the AT commands and transmit the data via Linux Network Stack.

Additional info:

- When AT#ISEL=1 is issued, the following socket AT commands are executed in WE866Cx Connection Manager:

  #SS

  #SI

  #ST

  #SD

  #SSEND

  #SH

Not Subject to NDA

#SA

#SL

#SLUDP

#SRECV

#SSENDUDP

#SCFG

#SCFGEXT

#SCFGEXT2

#SCFGEXT3

#SLASTCLOSURE

#SO

#SSENDUDPEXT

#SSENDEXT

#PKTSZ

#DSTO

NOTE: Since the connection manager interface is tightly coupled with USB configuration ports 13 and 14, the AT#ISEL commands will work in USBCFG 13 and 14 only. Hence, AT#ISEL should be executed after AT#CONNMGRSTART

AT#ISEL?

Read command reports the current mode enabled.

AT#ISEL=?

Test command reports the available range of values for the parameter <mode>

Not Subject to NDA

3.8.17. AT#WLANBD - Store and erase custom bin file

This command is used to add or change the WLAN board data firmware file or otp file.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#WLANBD=<index>[,<size>]

Set command allows to add or change the WLAN board data firmware file or otp file.

Parameters:

Name	Type	Default	Description
<index>	integer	N/A	This parameter specifies the type of bin file for upload. Values: 0 : bdwlan.bin (WLAN board data firmware) 1 : otp.bin (otp)
<size>	integer	-	The parameter is optional parameter to specify the size of wlan board data firmware file or otp bin. If this parameter not specified, the data transfer will be ended when the '+++' has been input. If the size parameter is zero and there are added bin file matched to the **<index>**, it will be cleared for set to default.

6. The new bin will be applied after next wlan enable.
7. The new bin will be stored in the file system and will not be cleared even after a reboot. The new bin will be used as default if it's exist.
8. The new bin will be set to default (cleared) after the LE910Cx is flashed with TFI or XFP.

Not Subject to NDA

AT#WLANBD?

Read command returns status of the currently added wlan board data firmware file or otp file.

#WLANBD : <index>,<size>

#WLANBD : <index>,<size>

Parameter:

<index> The parameter indicate the kind of bin file.

0: bdwlan.bin (wlan board data firmware)

1: otp.bin (otp)

<size> 0 means there are no added wlan board data firmware file. (default)

If the size lager than 0, it means there are added firmware file.

AT#WLANBD=?

Test command returns OK result code.

Not Subject to NDA

3.8.18. AT#WLANICMP - WLANICMP Ping Support

This command enables/disables the ICMP Ping support on WLAN interface.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANICMP=<mode>

Set Command enables/disables the ICMP Ping support on WLAN interface.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	ICMP Ping Support Mode

Values:

0 : Disable ICMP Ping support

1 : Reserved

2 : Enable free ICMP ping support; the module is sending a proper ECHO_REPLY to every IP address pinging it.

AT#WLANICMP?

Read command returns whether the ICMP Ping support is currently enabled or not, in the format:

#WLANICMP: <mode>

AT#WLANICMP=?

Test command reports the supported range of values for the <mode> parameter.

Not Subject to NDA

3.8.19. AT#WLANPING - Send PING request

This command is used to send Ping Echo Request Messages and to receive the corresponding Echo Reply on WLAN Interface.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANPING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>]]]]

Set command is used to send Ping Echo Request Messages and to receive the corresponding Echo Reply on WLAN Interface.

Parameters:

Name	Type	Default	Description
<IPaddr>	string	-	IP address of the remote host. This parameter can be either: 9. Any valid IP address in the format: "xxx.xxx.xxx.xxx" 10. Any host name to be solved with a DNS query
<retryNum>	string	4	Number of Ping Echo Requests to send Value: 1÷64 : The supported range of ping echo requests to send.
<len>	integer	32	The length of Ping Echo Request message. Value: 32÷1640 : The supported range of length for Ping Echo request message.
<timeout>	integer	50	Timeout in 100 ms units, waiting a single Echo Reply.

Not Subject to NDA

			Value: 10÷600 : timeout
<ttl>	integer	128	Time to live Value: 1÷255 : Time to live

Additional info:

- Once all the Echo Reply messages are received, a string like that is displayed:

  #WLANPING: <replyid>,<IP address>,<replyTime>,<ttl>

  Where:
  <replyid> - Echo Reply Number

  <IPAddress> - 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.

When the Echo Request timeout expires (no reply received on time) the response will contain **<replyTime>** set to 600 and **<ttl>** set to 255.

To receive the corresponding Echo Reply is not required to enable separately **AT#WLANICMP.**

Ping interval is 200 milli seconds.

Not Subject to NDA

Node will wait for all the ping replies and then displayed. For example, if **retryNum** is 64 then result is displayed once all 64 results are received.

AT#WLANPING= "www.telit.com"

#WLANPING: 01,"81.201.117.177",6,50

#WLANPING: 02,"81.201.117.177",5,50

#WLANPING: 03,"81.201.117.177",6,50

#WLANPING: 04,"81.201.117.177",5,50

OK

Not Subject to NDA

3.8.20. AT#WLANAPCLIND - WLAN AP client list change notification

This command is used to enable/disable the WLAN AP client list change indication.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANAPCLIND=<mode>

Set command is used to enable/disable the WLAN AP client list change indication. Relevant for AP mode only.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Client list change indication Values: 0 : Disable WLAN AP client list change indication 1 : Enable WLAN AP client list change indication

Note:
WLAN event notification must be disabled before entering online data mode.

If WLAN event notification is enabled, then client list change indication is displayed as given below. After the indication host can query the client list using AT#WLANAPCLIST command.

<CR><LF>#WLANAPCLIND<CR><LF>

AT#WLANAPCLIND?

Read command returns whether the WLAN event notification is currently enabled or not, in the format:

#WLANAPCLIND: <mode>

Not Subject to NDA

Not Subject to NDA

3.8.21. AT#WLANCMIFSEL - Select between Concurrent mode interfaces

This command is used to switch between the two concurrent WLAN interfaces.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANCMIFSEL=<IFnum>

Set command allows you to select the requested type of WLAN interface, to apply further AT commands.

Parameter:

Name	Type	Default	Description
<IFnum>	integer	0	Current Interface
	Values: 0 : First Interface 1 : Second Interface		

This command is applicable only to the Concurrent mode supported in AT#WLANMODE=<3>.

AT#WLANCMIFSEL?

Read command returns the currently selected concurrent mode WLAN interface status in the format:

#WLANCMIFSEL: <IFnum>

Where:

<IFnum>

0 - First interface (default)

1 - Second interface

Not Subject to NDA

Note: The default value is 0

AT#WLANCMIFSEL=?

Test command returns the supported range of values for parameter **<IFnum>.**

Not Subject to NDA

3.8.22. AT#WLANAPCLIST - Wi-Fi client information

This Command returns number of clients, their MAC addresses , IP addresses, Host names, and Tx/Rx statistics.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANAPCLIST

Returns number of clients, their MAC addresses , IP addresses, Host names, and Tx/Rx statistics.

AT#WLANAPCLIST=?

Test commands returns OK

AT#WLANAPCLIST

#WLANAPCLIST:

1,"00:f4:6f:9b:4f:b9","192.168.68.100","www.client1.com",569,3467

#WLANAPCLIST:

2,"00:1d:c9:01:02:03","192.168.68.101","www.client2.com",500,367

OK

Not Subject to NDA

3.8.23. AT#WLANCLOCK - Set SDIO clock of the WLAN

This command is used to set the SDIO clock of the WLAN interface

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#WLANCLOCK=<clock>

Set command for configure SDIO clock of the WLAN.

Parameter:

Name	Type	Default	Description
<clock>	integer	6	parameter to specify the SDIO clock Values: 1 : 400khz 2 : 20Mhz 3 : 25Mhz 4 : 50Mhz 5 : 100Mhz 6 : 200Mhz

In order to apply new configuration, the WLAN must be restarted.

This value stored into module storage and keep maintain changed value by customer even if reboot or FW update

AT#WLANCLOCK?

Read currently configured SDIO clock of the WLAN as below format

Not Subject to NDA

#WLANCLOCK: <clock>

Additional info:

- The parameter is displaying currently configured <clock> value

Name	Type	Default	Description
<clock>	integer	6	The currently configured <clock> value Values: 1 : 400khz 2 : 20Mhz 3 : 25Mhz 4 : 50Mhz 5 : 100Mhz 6 : 200Mhz

AT#WLANCLOCK=?

Test command returns the supported range for parameter **<clock>**

#WLANCLOCK: (1 - 6)

OK

Not Subject to NDA

3.8.24. AT#WLANMODULE - WLAN Module Type

This command is used to define the WLAN Module Type.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#WLANMODULE[=[<module_id>]]

Set command allows to define WLAN module type to be used.

It will select the appropriate WLAN board file to be downloaded to the module.

Parameter:

Name	Type	Default	Description
<module_id>	integer	0	Module Identification Number
	Values:		
	0 : Module Type WE866C3		
	1 : Module Type WE866C6		

Additional info:

- Default selected module type is WE866C3

This command is applicable after starting WE866Cx Connection Manager application. This command should be run after configuring AT#ISEL=1.

This command should be run before running AT#WLANSTART command.

Not Subject to NDA

This is a one-time configuration command, the configuration is retained across reboots, power cycles, FOTA but not after XFP/TFI update. The configuration must be done again after XFP/TFI update.

AT#WLANMODULE?

Read command returns the current configured WLAN Module type

#WLANMODULE: <module_id>

Where:

<module_id>

0 - Module Type WE866C3

1 - Module Type WE866C6

AT#WLANMODULE=?

Test command reports supported range of values for all parameters.

```
at#wlanmodule?
#WLANMODULE: 0
 OK
```


Not Subject to NDA

3.8.25. AT#WLANDFS - WLAN DFS Master Feature

This command is used to enable/disable WLAN DFS Master Feature.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#WLANDFS=[<dfs_master_en>]

Set command allows to enable/disable WLAN DFS Master feature.

It configures WLAN Access Point mode to operate or avoid DFS channels.

Parameter:

Name	Type	Default	Description
<dfs_master_en>	integer	1	Enable/disable DFS channel support. By default, DFS is enabled in the system. Values: 0 : Disable DFS channels support 1 : Enable Access Point operation for DFS channels

NOTE: This command is applicable after starting WE866Cx Connection Manager application. This command should be executed after configuring AT#ISEL=1.

This command should be run before running AT#WLANSTART command.

This is a one-time configuration command, the configuration is retained across reboots, power cycles, FOTA but not after XFP/TFI

Not Subject to NDA

update. The configuration must be done again after XFP/TFI update.

AT#WLANDFS?

Read command returns the current DFS Master mode configuration.

#WLANDFS: <configuration>

Where:

<configuration>

0 - DFS Master feature disabled

1 - DFS Master feature enabled

AT#WLANDFS=?

Test command reports supported range of values for all parameters.

```
at#wlandfs?
#WLANDFS: 1
 OK
```


Not Subject to NDA

3.8.26. AT#WLANMACMODE - Enable/disable MAC address filtering

This command is used to enable/disable the MAC address filter and is Relevant for AP mode only.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANMACMODE=<mode>

Set command allows to enable/disable the MAC address filter. Relevant for AP mode only.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	MAC address filter Mode Values: 0 : Accept unless in deny list (default) 1 : Deny unless in accept list

AT#WLANMACMODE?

Read command returns the current mode in the format:

#WLANMACMODE : <num>

Example:
at#wlanmacmode?
#WLANMACMODE: 1

AT#WLANMACMODE=?

Not Subject to NDA

Test command returns the supported range of values for parameter <mode>

Not Subject to NDA

3.8.27. AT#CONNMGRSTART - Start/stop WE866C3 Connection Manager

This command is used to start/stop the WE866C3 Connection Manager application.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CONNMGRSTART=<operation>,<host_port_id>

Set command is used to start/stop WE866C3 Connection Manager application.

Parameters:

Name	Type	Default	Description
<operation>	integer	N/A	Operating State Values: 0 : Stop Connection Manager 1 : Start Connection Manager
<host_port_id>	integer	N/A	Host port ID Values: 0 : USB0 or USIF0 1 : USB1 or USIF0 2 : Reserved 3 : Reserved

NOTE: To use main uart(USIF0), AT#M2MATP must be configured as 1 (enable) before starting connection manager.

Not Subject to NDA

AT#CONNMGRSTART?

Read command return the current operating state:

#CONNMGRSTART: <operation>

Where: <operation>

0 - Not running

1 - Running

AT#CONNMGRSTART=?

Test command return the supported ranges

```
AT#CONNMGRSTART=1,1
OK
AT#CONNMGRSTART?
#CONNMGRSTART: 1
OK
AT#CONNMGRSTART=?
#CONNMGRSTART: (0-1),(0-3)
```


Not Subject to NDA

3.8.28. AT#WLANMACDENY - Add/remove MAC address to/from deny list

This command is used to add/remove MAC address to/from deny list.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANMACDENY=<mode>,<mac_address>

Set command allows to add/remove MAC address to/from deny list.
Relevant for AP mode only.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	Deny list mode Values: 0 : Remove from deny list 1 : Add to deny list
<mac_address>	string	-	Mac address. Note: Mac address should be written with ':' between each Hexa number. Example: 00:A0:C6:00:00:17

AT#WLANMACDENY?

Read command returns the deny list.

AT#WLANMACDENY=?

Test command returns the supported range of values for parameters.

Not Subject to NDA

Not Subject to NDA

3.8.29. AT#WLANMACACCEPT - Add/Remove MAC address to/from accept list

This command allows to add/remove MAC address to/from accept list.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANMACACCEPT=<mode>,<mac_address>

Set command allows to add/remove MAC address to/from accept list. Relevant for AP mode only.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	Accept list Mode Values: 0 : Remove from accept list 1 : Add to accept list
<mac_address>	string	-	MAC Address. NOTE: Mac address should be written with ':' between each Hexa number. Example: 00:A0:C6:00:00:17

AT#WLANMACACCEPT?

Read command returns the accept list:

AT#WLANMACACCEPT=?

Test command returns the supported range of values for parameters.

Not Subject to NDA

Not Subject to NDA

3.8.30. AT#WLANCOUNTRYCODE - Set the regulatory domain

This command is used to change the country code.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANCOUNTRYCODE=<country_code>

Set command allows to change the country code. Relevant for AP mode only.

Parameter:

Name	Type	Default	Description
<country_code>	string	-	Country Code

Note: This can limit available channels and transmit power.
Default: US

AT#WLANCOUNTRYCODE?

Read Command returns the current country code in the format:

#WLANCOUNTRYCODE: <string>

Example:
at#wlancountrycode?

#WLANCOUNTRYCODE: US

OK

AT#WLANCOUNTRYCODE=?

Test command returns OK

Not Subject to NDA

Not Subject to NDA

3.8.31. AT#WLANMAC - Return Wi-Fi Hot-Spot MAC address

This command will return Wi-Fi Hot-Spot MAC address

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANMAC

Execution Command will return Wi-Fi Hot-Spot MAC address

AT#WLANMAC=?

Test command returns OK

```
AT#WLANMAC
#WLANMAC: "00:f4:6f:9b:4f:b9"
OK
```


Not Subject to NDA

3.8.32. AT#WLANPC - Change the channel number and the wlan protocol

This command is used to change the AP channel number and the protocol.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WLANPC=<mode>,<num>

Set command allows to change the AP channel number. Relevant for AP mode only.

Parameters:

Name	Type	Default	Description
<mode>	integer	2	Protocol type Values: 0 : 'b-only' (2.4 GHz) 1 : 'b/g' (2.4 GHz) 2 : 'b/g/n' (2.4 GHz) 3 : 'a/n' (5 GHz) 4 : 'a/n/ac' (5 GHz)
<num>	integer	-	Channel number. default value is 6

The channel can be selected automatically at run time by setting channel=0.

AT#WLANPC?

Read command returns the current channel number and protocol in the format:

Not Subject to NDA

#WLANPC : <mode>,<num>

For example:

AT#WLANPC?

#WLANPC: 1,12

OK

AT#WLANPC=?

Test command returns the supported range of values for parameter **<mode>.**

Not Subject to NDA

3.9. Packet Domain

3.9.1. AT#SWITCHATTPROF - Enable/Disable special LTE attach policy based on operator requirements

Enable/Disable special LTE attach policy based on operator requirements

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SWITCHATTPROF=<mode>

Set command to enable or disable special LTE attach policy based on operator requirements

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	enable or disable special LTE attach policy Values: 0 : Disable 1 : Enable

- Manual reboot is required after changing.
- Predefined default value is dependent according to operator requirements.
- Predefined default value that operator requested should not recommended to change.
- This command is required when testing such as GCF/PTCRB RRM (Radio Resource Management) without setting the requirements of operators in the equipment.

Not Subject to NDA

AT#SWITCHATTPROF?

Read command reports the currently selected <mode> in the format:

#SWITCHATTPROF: <mode>

AT#SWITCHATTPROF=?

Test command reports the supported range of values.

Not Subject to NDA

3.9.2. AT#DUALAPN - Double PDP Context on Same APN

Set command enables/disables the same APN multiple PDN feature.
The network operator can reply with reject to the PDN Connectivity Request on an APN already in use with:

Cause #55 - Multiple PDN connections for a given APN not allowed

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#DUALAPN=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	mode

Values:

0 : Disable the same APN multiple PDN feature

1 : Enable the same APN multiple PDN feature

These values are saved in the non-volatile memory.

#DUALAPN does not affect the standard +CGACT.

Manual reboot is required after changing.

AT#DUALAPN?

Read command reports the current setting for **<mode>**

Not Subject to NDA

AT#DUALAPN=?

Test command returns the allowed values for parameter **<mode>**.

Not Subject to NDA

3.9.3. AT+CGCLASS - GPRS Mobile Station Class

This command sets the GPRS class.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGCLASS=[<class>]

Set command sets the GPRS class according to <**class**> parameter.

Parameter:

Name	Type	Default	Description
<class>	string	"A"	GPRS class

Values:

"A" : Class-A mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode) (factory default)

"B" : Class-B mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode)

"CG" : Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode)

"CC" : Class-C mode of operation in CS only mode (A/Gb mode), or CS (Iu mode)

AT+CGCLASS?

Read command returns the mode of operation set by the TE, in the format:

+CGLASS: <class>

Not Subject to NDA

AT+CGCLASS=?

Test command reports the range for the parameter <**class**>.

Not Subject to NDA

3.9.4. AT#LABIMS - IMS (34.299) Configuration for GCF/PTCRB certification

IMS (34.299) Configuration for GCF/PTCRB certification

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#LABIMS

resets the IMS parameters in the NVM of the device to the IR92 for GCF/PTCRB certification.

Manual reboot is required after changing.

This command is required for testing GCF/PTCRB IMS 34.229.

AT#LABIMS=?

Test command returns the **OK** result code.

Not Subject to NDA

3.9.5. AT+CGQREQ - Quality of Service Profile (Requested)

Set command allows to specify a Quality of Service Profile (requested) 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>.

3GPP TS 27.007
3GPP TS 03.060
3GPP TS 23.060

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see **+CGDCONT** command).
<precedence>	integer	0	precedence class
	Value:		
	0÷max	:	use test command to know the values range
<delay>	integer	0	delay class
	Value:		
	0÷max	:	use test command to know the values range
<reliability>	integer	0	reliability class

Not Subject to NDA

	Value: 0÷max : use test command to know the values range		
<peak>	integer	0	peak throughput class Value: 0÷max : use test command to know the values range
<mean>	integer	0	mean throughput class Value: 0÷max : use test command to know the values range

If a value is omitted for a particular class then this class, is not checked

AT+CGQREQ=<cid> is a special set command syntax that delates the PDP context identified by <**cid**> index.

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.

Not Subject to NDA

AT+CGQREQ=?

Test command returns as a compound value the type of the current PDP context and the supported values for the sub parameters 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)**

Additional info:

- PDP type meaning.

Name	Type	Default	Description
<PDP_Type>	string	-	specifies the type of packet data protocol (see **+CGDCONT** command)

```
AT+CGQREQ?
+CGQREQ: 1,0,0,3,0,0
OK

AT+CGQREQ=1,0,0,3,0,0
OK

AT+CGQREQ=?
+CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
+CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
+CGQREQ: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31)
OK
```


Not Subject to NDA

3.9.6. AT+CGDCONT - Define PDP Context

Define PDP Context.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<Emergency_ind>]]]]]]]]

Set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <**cid**>.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	(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>	string	N/A	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. Values: "IP" : Internet Protocol "PPP" : Point to Point Protocol "IPV6" : Internet Protocol, Version 6 "IPV4V6" : Virtual <PDP_type> introduced to handle dual IP stack UE capability

Not Subject to NDA

<APN>	string	-	(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>	string	-	A string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the **+CGPADDR** command.
<d_comp>	integer	0	Numeric parameter that controls PDP data compression. Values: 0 : compression off 1 : compression on 2 : V.42bis
<h_comp>	integer	0	Numeric parameter that controls PDP header compression. Values: 0 : compression off 1 : compression on 2 : RFC1144 (applicable for SNDCP only) 3 : RFC2507 4 : RFC3095 (applicable for PDCP only)
<IPv4AddrAlloc>	integer	0	a numeric parameter that controls how the MT/TA requests to get the IPv4 address information.

Not Subject to NDA

			Values: 0 : IPv4 Address Allocation through NAS Signaling 1 : IPv4 Address Allocated through DHCP
<Emergency_ind>	integer	0	indicates whether the PDP context is for emergency bearer services or not. Values: 0 : PDP context is not for emergency bearer services 1 : PDP context is for emergency bearer services

- a special form of the Set command, **+CGDCONT=<cid>**, causes the values for context number **<cid>** to become undefined, except **cid** = 1 and emergency profile.
- emergency profile could be undefined only after setting emergency indication parameter to 0.
- Although max number of PDP profile is 24 , the user can only create 16 PDP profiles (persistent profiles) , the rest 8 are temporarily profiles.
- Profile 1 is the default profile and the attach profile, so even if you delete all profiles, the profile 1 is always regenerated regardless rebooting.
- In case of Verizon network operator, profile 3 is also used to attach profile. So if delete 3 profile with **+CGDCONT=3** command, profile 3 is re-created after rebooting.
- Predefined PDP profile file that operator requested should not recommended to delete.

Not Subject to NDA

In case of Docomo network operator, profile 5 is reserved for dedicated Device Management profile only.

AT+CGDCONT?

Read command returns the current settings for each defined context in the format:

+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,<IPv4AddrAlloc>,<Emergency_ind><CR><LF>

+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,<IPv4AddrAlloc>,<Emergency_ind>[...]

AT+CGDCONT=?

Test command returns values supported as a compound value.

```
AT+CGDCONT=1,"IP","APN","10.10.10.10",0,0
OK

AT+CGDCONT?
+CGDCONT: 1,"IP","APN","10.10.10.10",0,0,0,0

OK

AT+CGDCONT=?
+CGDCONT: (1-24),"IP",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"PPP",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"IPV6",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"IPV4V6",,,(0-2),(0-4),(0-1),(0-1)

OK
```


Not Subject to NDA

3.9.7. AT+CGCONTRDP - PDP Context Read Dynamic Parameters

The execution command returns the relevant information for a PDP Context established by the network.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGCONTRDP[=<cid>]

The execution command returns the relevant information on a PDP Context established by the network with the context identifier <**cid**>. If the parameter <**cid**> is omitted, the information for all established PDP contexts is returned. The response message has the following format:

+CGCONTRDP:<cid>,<bearerId>,<apn>[,<ip&subnet>[,<gw_addr>[,<DNS_prim>[,<DNS_sec>[,<P_CSCF_prim>[,<P_CSCF_sec>]]]]]][<CR><LF>
+CGCONTRDP:<cid>,<bearerId>,<apn>[,<ip&subnet_mask>[,<gw_addr>[,<DNS_prim>
[,<DNS_sec>[,<P_CSCF_prim>[,<P_CSCF_sec>]]]]]] [...]]

If the context cannot be found an **ERROR** response is returned.

The response message parameters are described in the Additional info section.

If the parameter **<cid>** is omitted, the relevant information for all active non secondary PDP contexts is returned.

Parameter:

Name	Type	Default	Description
<cid>	integer	-	identifies a non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands.

Not Subject to NDA

Additional info:

- List of the meaning of the response message parameters.

Name	Type	Default	Description
<berrerId>	integer	-	identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.
<apn>	string	-	logical name used to select the GGSN or the external packet data network.
<ip&subnet>	string	-	IP address and subnet mask of the MT. The string is given as dot-separated numeric (0-255) parameters on the form. For more information, see next Additional info section.
<gw_addr>	string	-	Gateway address of the MT. The string is given as dot-separated numeric (0-255) parameters.
<DNS_prim>	string	-	IP address of the primary DNS Server.
<DNS_sec>	string	-	IP address of the secondary DNS Server.
<P_CSCF_prim>	string	-	IP address of the primary P-CSCF Server.
<P_CSCF_sec>	string	-	IP address of the secondary P-CSCF Server.

- Referring to **<ip&subnet>** parameter:

  the string is given as dot-separated numeric (0-255) parameters. The format is:

Not Subject to NDA

for IPv4:

"a1.a2.a3.a4.m1.m2.m3.m4"

for IPv6:

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

When **+CGPIAF** is supported, its settings can influence the format of this parameter returned with the execute form of **+CGCONTRDP**.

The dynamic part of the PDP context will only exist if established by the network. The test command returns a list of <**cid**>s associated with active contexts.

If the MT has dual stack capabilities, two lines of information are returned per <**cid**>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters.

AT+CGCONTRDP=?

Return the list of <**cid**>s associated with active contexts.

Not Subject to NDA

AT+CGACT=1,1

OK

AT+CGCONTRDP=?

+CGCONTRDP: (1)

OK

AT+CGCONTRDP =1

+CGCONTRDP:
1,5,lte.ktfwing.com,"10.196.170.243.255.255.255.248","10.196.170.244","172.19.140.7
","172.25.227.7"

OK

Not Subject to NDA

3.9.8. AT#IMSSETTING - Sets IMS parameters

This command sets the IMS parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#IMSSETTING=<mode>[,<value>]

This command sets the IMS parameters.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	IMS parameter identifier Values: 0 : IMS domain name 1 : username 2 : password 3 : sipt1 4 : sipt4 5 : sipt2 6 : SMS format 7 : SMS Over IP Network Indication
<value>	string	-	string parameter

Additional info:

- Parameters (**<username>**,**<password>**) have no effect and are included only for backward compatibility.

Not Subject to NDA

- **AT#IMSSETTING=<mode>**, read command is made for parameter **<mode>**.

Default value of <SMS Over IP Network Indication> for ATT firmware / Softbank firmware / Telstra firmware / Vodafone NZ firmware are configured to '0' and for the others are '1'.

Default value of <sipt1>, <sipt2> and <sipt4> are based on operator requirements.

AT#IMSSETTING?

Read command is not supported.

AT#IMSSETTING=?

Test command returns the supported range of <mode> in the format:

#IMSSETTING: (0-7),

Not Subject to NDA

3.9.9. AT+CGQMIN - Quality of Service Profile (Minimum Acceptable)

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.

3GPP TS 27.007
3GPP TS 03.060
3GPP TS 23.060

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see **+CGDCONT** command)
<precedence>	integer	0	precedence class
	Value:		
	0÷max	:	use test command to know the values range
<delay>	integer	0	delay class
	Value:		
	0÷max	:	use test command to know the values range
<reliability>	integer	0	reliability class

Not Subject to NDA

	Value: 0÷max : use test command to know the values range		
<peak>	integer	0	peak throughput class Value: 0÷max : use test command to know the values range
<mean>	integer	0	mean throughput class Value: 0÷max : use test command to know the values range

If a value is omitted for a class, then this class is not checked.

A special form of the set command, **AT+CGQMIN=<cid>** causes the requested profile for context number <**cid**> to become undefined.

AT+CGQMIN?

Read command returns the current settings for each defined context in the format:

+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>

+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]

If no PDP context has been defined, it has no effect and **OK** result code is returned

AT+CGQMIN=?

Not Subject to NDA

Test command returns as a compound value the type of the current PDP context and the supported values for the sub parameters 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)**

Additional info:

- PDP type meaning.

Name	Type	Default	Description
<PDP_Type>	string	-	specifies the type of packet data protocol, see **+CGDCONT** command Only the "IP" **<PDP_Type>** is currently supported.

Not Subject to NDA

3.9.10. AT+CGEQREQ - 3G Quality of Service Profile (Requested)

The command allows to specify a 3G quality of service profile for the context identified by the context identification parameter.

[1] 3GPP TS 27.007
[2] 3GPP TS 23.107

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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 specifies 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:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see **+CGDCONT** command).
<Traffic class>	integer	4	traffic class Values: 0 : conversational 1 : streaming 2 : interactive

Not Subject to NDA

	3 : background 4 : subscribed value		
<Maximum bitrate UL>	integer	0	maximum bitrate Up Link (kbits/s) Values: 0 : subscribed value 1÷11520 : supported range
<Maximum bitrate DL>	integer	0	maximum bitrate down link (kbits/s) Values: 0 : subscribed value 1÷42200 : supported range
<Guaranteed bitrate UL>	integer	0	the guaranteed bitrate up link(kbits/s) Values: 0 : subscribed value 1÷11520 : supported range
<Guaranteed bitrate DL>	integer	0	the guaranteed bitrate down link(kbits/s) Values: 0 : subscribed value 1÷42200 : supported range
<Delivery order>	integer	2	SDU delivery order Values:

Not Subject to NDA

	0 : disable 1 : enable 2 : subscribed value		
<Maximum SDU size>	integer	0	maximum SDU size in octets Values: 0 : subscribed value 1÷1520 : supported range
<SDU error ratio>	string	0E0	SDU error ratio - mEe = m*10-e , for example 1E2 means 1*10-2 Values: 0E0 : means 0*10-0 1E1 : means 1*10-1 1E2 : means 1*10-2 7E3 : means 7*10-3 1E3 : means 1*10-3 1E4 : means 1*10-4 1E5 : means 1*10-5 1E6 : means 1*10-6
<Residual bit error ratio>	string	0E0	residual bit error ratio - mEe = m*10-e , for example 1E2 mean 1*10-2 Values: 0E0 : means 0*10-0 5E2 : means 5*10-2

Not Subject to NDA

	1E2 : means 1*10-2 5E3 : means 5*10-3 4E3 : means 4*10-3 1E3 : means 1*10-3 1E4 : means 1*10-4 1E5 : means 1*10-5 1E6 : means 1*10-6 6E8 : means 6*10-8		
<Delivery of erroneous SDUs>	integer	3	delivery of erroneous SDUs Values: 0 : disable 1 : enable 2 : no detect 3 : subscribed value
<Transfer delay>	integer	0	transfer delay (ms) Values: 0 : subscribed value 100÷4000 : supported range
<Traffic handling priority>	integer	0	traffic handling priority Values:

Not Subject to NDA

	0 : subscribed value 1÷3 : supported range		
<Source Statistics Descriptor>	integer	0	specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). Values: 0 : characteristics of SDUs is unknown 1 : characteristics of SDUs corresponds to a speech source
<Signalling Indication>	integer	0	used to indicate signalling content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). Values: 0 : PDP context is not optimized for signalling 1 : PDP context is optimized for signalling

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

AT+CGEQREQ?

Read command returns the current settings for each defined context in the format:

Not Subject to NDA

[+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>][...]

If no PDP context defined, it has no effect and **OK** result code returned.

AT+CGEQREQ=?

Test command returns as a compound value the type of the current PDP context and the supported values for the sub parameters in the format:

+CGQREQ: <PDP_Type>,(list of supported <Traffic class>s),

(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported<Maximum SDU size>s),(list of supported<SDU error ratio>s),(list of supported<Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s ,(list of supported <Source statistics descriptor>s) ,(list of supported <Signalling indication>s)

Not Subject to NDA

AT+CGEQREQ=1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0

OK

AT+CGEQREQ?

+CGEQREQ: 1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0,0,0

OK

AT+CGEQREQ=?

+CGEQREQ: "IP",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

+CGEQREQ: "PPP",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

+CGEQREQ: "IPV6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

+CGEQREQ: "IPV4V6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

OK

Not Subject to NDA

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

This command allows the TE to retrieve the negotiated 3G quality of service returned in the Activate PDP Context Accept/Modify message.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGEQNEG=[<cid>[,<cid>[,...]]]

Set command returns the negotiated 3G QoS profile for the specified context identifiers, **<cid>**s. The QoS profile consists of a number of parameters, each of which may have a separate value.

+CGEQNEG: <cid>, <Traffic class>, <Maximum bitrate UL> ,<Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>[<CR><LF>

+CGEQNEG: <cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>[...]]

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see **+CGDCONT** command)

Not Subject to NDA

AT+CGEQNEG=?

Test command returns a list of **<cid>**s associated with active contexts.

AT+CGEQREQ?

+CGEQREQ: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

AT+CGACT=1,1

OK

AT+CGEQNEG=?

+CGEQNEG: (1)

OK

AT+CGEQNEG=1

+CGEQNEG: 1,3,128,384,0,0,2,1500,"1E4","1E5",3,0,1,0,0

OK

Not Subject to NDA

3.9.12. AT+CGPADDR - Show PDP Address

This command returns a list of PDP addresses for the specified context identifiers.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGPADDR=[<cid>[,...]]

Execution command returns a list of PDP addresses for the specified context identifiers.

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a PDP context definition, see **+CGDCONT** command. If no **<cid>** specified, the addresses for all defined contexts are returned.

Additional info:

- The command returns a row of information for every <**cid**> whose context has been defined. No row is returned for a <**cid**> whose context has not been defined. Here is the response format:

  +CGPADDR: <cid>,<PDP_addr><CR><LF>
  +CGPADDR: <cid>,<PDP_addr><CR><LF>
  ...

Name	Type	Default	Description
<PDP_addr>	string	-	identifies the terminal in an address space applicable to the

Not Subject to NDA

PDP. The address may be static or dynamic:

11. for a static address, it will be the one set by the **+CGDCONT** command when the context was defined

12. for a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**; **<PDP_addr>** is omitted if none is available

AT+CGPADDR=?

Test command returns a list of defined <**cid**>s.

Not Subject to NDA

AT+CGACT=1,3

OK

AT+CGACT?

+CGACT: 1,0

+CGACT: 2,0

+CGACT: 3,1

OK

AT+CGPADDR=3
+CGPADDR: 3,"xxx.yyy.zzz.www"

OK

AT+CGPADDR=?
+CGPADDR: (3)

OK

Not Subject to NDA

3.9.13. AT+CGCMOD - Modify PDP Context

The execution command is used to modify the specified PDP context(s) with respect to QoS profiles and TFTs.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGCMOD=[<cid_n>[,...]]

After command has completed, the MT returns to V.250 online data state. If the requested modification for any specified context cannot be achieved, an **ERROR** or **+CME: ERROR** response is returned. Extended error responses are enabled by the **+CMEE** command.

For EPS, the modification request for an EPS bearer resource will be answered by the network by an EPS bearer Modification request. The request must be accepted by the MT before the PDP context effectively changed.

Parameter:

Name	Type	Default	Description
<cid_n>	integer	-	generic PDP context identifier.

If no parameters are specified (no **<cid_n>** specified), the command modifies all active contexts.

AT+CGCMOD=?

Test command returns a list of **<cid_n>**s associated with active contexts.

+CGCMOD: (list of <cid_n>s associated with active contexts)

Not Subject to NDA

3.9.14. AT#AUTOATT - Auto-Attach Property

Execution command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#AUTOATT=[<auto>]

Parameter:

Name	Type	Default	Description
<auto>	integer	1	GPRS auto-attach property

Values:

0 : disables GPRS auto-attach property

1 : enables GPRS auto-attach property (factory default): after the command #AUTOATT=1 issued (and at every following startup) the terminal will automatically try to attach to the GPRS service.

AT#AUTOATT?

Read command reports whether the auto-attach property is currently enabled or not, in the format:

#AUTOATT: <auto>

AT#AUTOATT=?

Test command reports available values for parameter **<auto>**.

Not Subject to NDA

3.9.15. AT#MSCLASS - Multislot Class Control

Set command sets the GPRS multislot class.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#MSCLASS=[<class>[,<autoattach>]]

Parameters:

Name	Type	Default	Description
<class>	integer	33	GPRS multislot class. Values: 1÷12 : class 30÷33 : class
<autoattach>	integer	0	specify when the new multislot class will be enabled. Values: 0 : the new multislot class is enabled only at the next detach/attach or after a reboot. 1 : the new multislot class is enabled immediately, automatically forcing a detach / attach procedure only in case of GSM network registered

It is only available for variants that support GSM.

AT#MSCLASS?

Not Subject to NDA

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**>.

Not Subject to NDA

3.9.16. AT#IMSUA - IMS user agent

This command sets IMS user agent. The user agent string needs to be sent with SIP message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#IMSUA=<UserAgent>

This command sets IMS user agent. The user agent string needs to be sent with SIP message.

Parameter:

Name	Type	Default	Description
<UserAgent>	string	-	IMS user agent

AT#IMSUA?

Read command returns the IMS User Agent in format:

#IMSUA: <UserAgent>

AT#IMSUA=?

Test command returns the supported string length for parameter:

<UserAgent>

Not Subject to NDA

```
AT#IMSUA="ims"
OK

AT#IMSUA?
#IMSUA: ims

OK

AT#IMSUA=?
#IMSUA: (549)

OK
```


Not Subject to NDA

3.9.17. AT#GAUTH - PPP Data Connection Authentication Type

This command sets the authentication type used in PDP Context Activation during PPP-PS connections.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#GAUTH=[<type>]

Set command sets the authentication type used in PDP Context Activation during PPP-PS connections.

Parameter:

Name	Type	Default	Description
<type>	integer	3	authentication type used in PDP Context Activation during PPP-PS connections

Values:

0 : no authentication

1 : PAP authentication

2 : CHAP authentication

3 : AUTO authentication (PAP or CHAP or no authentication according to host application)

if the settings on the server side (the host application) of the PPP are not compatible with the **#GAUTH** setting, then the PDP Context Activation will use no authentication.

AT#GAUTH?

Read command reports the current authentication type, in the format:

Not Subject to NDA

#GAUTH: <type>

AT#GAUTH=?

Test command returns the range of supported values for parameter <type>.

Not Subject to NDA

3.9.18. AT#GPPPCFG - PPP-GPRS Parameters Configuration

This command permits to set parameters for a PPP-GPRS connection

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#GPPPCFG=<hostIPaddress>[,<unused_A>][,<unused_B>]]

Set command sets one parameter for a dial-up connection

Parameters:

Name	Type	Default	Description
<hostIPaddress>	string	-	**Host IP address** that is assigned to the PPP server side (the host application); String type, it can be any valid IP address in the format: "XXX.XXX.XXX.XXX"
<unused_A>	integer	-	unused parameter
<unused_B>	integer	-	unused parameter

if **<hostIPaddress>="000.000.000.000"** (factory default), host address is not included in the IPCP Conf Req and the 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>

Not Subject to NDA

AT#GPPPCFG=?

Test command returns the range of supported values for parameters

#GPPPCFG: (25),(0)

Not Subject to NDA

3.9.19. AT+CGEQMIN - 3G Quality of Service Profile (Minimum Acceptable)

This command sets the 3G Quality of Service parameters for the context identified by the context identification parameter.

3GPP TS 27.007; 3GPP TS 03.60/23.060; 3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see **+CGDCONT** command).
<Traffic class>	integer	4	traffic class. Values: 0 : conversational 1 : streaming 2 : interactive

Not Subject to NDA

	3 : background 4 : subscribed value		
<Maximum bitrate UL>	integer	0	maximum bitrate Up Link (kbits/s) Values: 0 : subscribed value 1÷11520 : supported range
<Maximum bitrate DL>	integer	0	maximum bitrate down link (kbits/s) Values: 0 : subscribed value 1÷42200 : supported range
<Guaranteed bitrate UL>	integer	0	the guaranteed bitrate up link(kbits/s) Values: 0 : subscribed value 1÷11520 : supported range
<Guaranteed bitrate DL>	integer	0	the guaranteed bitrate down link(kbits/s) Values: 0 : subscribed value 1÷42200 : supported range
<Delivery order>	integer	2	SDU delivery order Values:

Not Subject to NDA

	0 : No - SDU 1 : Yes - SDU 2 : subscribed value		
<Maximum SDU size>	integer	0	maximum SDU size in octets. Values: 0 : subscribed value 1÷1520 : supported range
<SDU error ratio>	string	0E0	SDU error ratio - mEe = m*10-e , for example 1E2 mean 1*10-2. Values: 0E0 : means 0*10-0 1E1 : means 1*10-1 1E2 : means 1*10-2 7E3 : means 7*10-3 1E3 : means 1*10-3 1E4 : means 1*10-4 1E5 : means 1*10-5 1E6 : means 1*10-6
<Residual bit error ratio>	string	0E0	residual bit error ratio - mEe = m*10-e , for example 1E2 mean 1*10-2 Values: 0E0 : means 0*10-0

Not Subject to NDA

	5E2 : means 5*10-2 1E2 : means 1*10-2 5E3 : means 5*10-3 4E3 : means 4*10-3 1E3 : means 1*10-3 1E4 : means 1*10-4 1E5 : means 1*10-5 1E6 : means 1*10-6 6E8 : means 6*10-8		
<Delivery of erroneous SDUs>	integer	3	delivery of erroneous SDUs. Values: 0 : no delivery 1 : yes 2 : no detect 3 : subscribed value
<Transfer delay>	integer	0	transfer delay (ms) Values: 0 : subscribed value 100÷4000 : supported range
<Traffic handling priority>	integer	0	traffic handling priority

Not Subject to NDA

	Values: 0 : subscribed value 1÷3 : supported range		
<Source Statistics Descriptor>	integer	0	specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [8] subclause 10.5.6.5). 3GPP Release 8 140 3GPP TS 27.007 V8.3.0 (2008-03)
	Values: 0 : characteristics of SDUs is unknown 1 : characteristics of SDUs corresponds to a speech source		
<Signalling Indication>	integer	0	used to indicate signalling content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 [8] subclause 10.5.6.5)
	Values: 0 : PDP context is not optimized for signalling 1 : PDP context is optimized for signalling		

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

Not Subject to NDA

AT+CGEQMIN?

Read command returns the current settings for each defined context in the format:

[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling><Source statistics descriptor>,<Signalling indication><CR><LF>]

[+CGEQMIN:...]

If no PDP context defined, it has no effect and **OK** result code returned.

AT+CGEQMIN=?

Test command returns as a compound value the type of the current PDP context and the supported values for the subparameters in the format:

+CGEQMIN: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bitrate UL>s), (listof 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)[...]]

Only the "IP" Packet Data Protocol type is supported.

Not Subject to NDA

AT+CGEQMIN=1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0

OK

AT+CGEQMIN?

+CGEQMIN: 1,0,384,384,128,128,0,0,"0E0","0E0",0,0,0

OK

AT+CGEQMIN=?

+CGEQMIN: "IP",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),

(0-
1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

+CGEQMIN: "PPP",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

+CGEQMIN: "IPV6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

+CGEQMIN: "IPV4V6",(0-4),(0-11520),(0-42200),(0-11520),(0-42200),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0,100-4000),(0-3),(0,1),(0,1)

OK

Not Subject to NDA

3.9.20. AT+CGEQOS - Define EPS Quality of Service

The command specifies the EPS Quality of Service parameters.

[1] 3GPP TS 23.203

[2] 3GPP TS 24.301

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGEQOS=[<cid>[,<QCI> [,<DL_GBR>,<UL_GBR> [,<DL_MBR>,<UL_MBR>]]]]

Set command specifies the EPS Quality of Service parameters.

A special form of the set command, **+CGEQOS= <cid>** causes the values for context number <**cid**> to become undefined.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	it specifies a particular EPS Traffic Flows definition in EPS
<QCI>	integer	9	it specifies a class of EPS QoS, see standard [1].
	Values:		
	0 :		QCI is selected by network
	1÷4 :		value range for guaranteed bit rate Traffic Flows
	5÷9 :		value range for non-guaranteed bit rate Traffic Flows
<DL_GBR>	integer	-	it indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is

Not Subject to NDA

			omitted for a non-GBR QCI, see standard [2].
<UL_GBR>	integer	-	indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].
<DL_MBR>	integer	-	it indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].
<UL_MBR>	integer	-	it indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].

Additional info:

▶▶ Possible Response(s):

+CME ERROR: <err>

AT+CGEQOS?

Read command returns the current settings for each defined QoS.

+CGEQOS: <cid>, <QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<CR>>LF>+CGEQOS: <cid>, <QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][...]]

AT+CGEQOS=?

Test command returns the ranges of the supported parameters:

+CGEQOS: (list of supported <cid>s),(list of supported <QCI>s), (list of supported <DL_GBR>s), (list of supported <UL_GBR>s), (list of supported <DL_MBR>s),(list of supported <UL_MBR>s)

Not Subject to NDA

3.9.21. AT+CGPIAF - Printing IP Address Format

This command selects the printout format of the IPv6 address.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros> [,<Pv6_CompressZeros>]]]]

Parameters:

Name	Type	Default	Description
<IPv6_AddressFormat>	integer	0	selects the IPv6 address format. Relevant for all AT command parameters that can hold an IPv6 address. Values: 0 : use IPv4-like dot-notation. IP addresses, and subnetwork mask if applicable, are dot-separated. 1 : use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space.
<IPv6_SubnetNotation>	integer	0	selects the subnet-notation for remote address and subnet mask. Setting does not apply if IPv6 address format **<IPv6_AddressFormat>=0**.

Not Subject to NDA

			Values: 0 : both IP address, and subnet mask are started explicitly, separated by a space. 1 : the printout format is applying /(forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation.
<IPv6_LeadingZeros>	integer	0	selects whether leading zeros are omitted or not. Setting does not apply if IPv6 address format <IPv6_AddressFormat>=0. Values: 0 : leading zeros are omitted. 1 : leading zeros are included.
<Pv6_CompressZeros>	integer	0	selects whether 1-n instances of 16-bit- zero values are replaced by only "::". This applies only once. Setting does not apply if IPv6 address format <IPv6_AddressFormat>=0. Values: 0 : no zero compression. 1 : use zero compression.

AT+CGPIAF?

Read command returns the current parameter setting.

Not Subject to NDA

AT+CGPIAF=?

Test command returns values supported as compound values.

```
AT+CGPIAF=0,0,0,0
OK

AT+CGACT=1,1
OK

AT+CGPADDR =
+CGPADDR: 1,"252.1.171.171.205.205.239.224.0.0.0.0.0.0.0.1"

OK

AT+CGPIAF=1,0,0,0
OK

AT+CGACT=1,1
OK

AT+CGPADDR =
+CGPADDR: 1,"FC01:ABAB:CDCD:EFE0:0:0:0:1"

OK
```


Not Subject to NDA

3.9.22. AT+CEVDP - Voice Domain Preference

This set command selects the voice domain preference.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+CEVDP=<domain>

Parameter:

Name	Type	Default	Description
<domain>	string	N/A	voice domain preference. The default value depends on product and the support of VoLTE. Values: 1 : CS voice only 2 : CS voice preferred, IMS PS voice as secondary 3 : IMS PS voice preferred, CS as secondary 4 : IMS PS voice only

Default value is 4 for LE910C1-SA/ST/SV/NS, and 3 for other model.

AT+CEVDP?

Read command returns the selected domain in the format:

Not Subject to NDA

+CEVDP: <domain>

AT+CEVDP=?

Test command returns the supported range of values of the parameter <domain>.

Not Subject to NDA

3.9.23. AT+CGEREP - Packet Domain Event Reporting

This command enables or disables the presentation of unsolicited result codes.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT+CGEREP=[<mode>[,<bfr>]]

Set command enables/disables sending of unsolicited result codes in case of certain events occurring in the module or in the network. The URC formats and related events are shown in the Additional info sections.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	controls the processing of URCs specified with this command.

Values:

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.

Not Subject to NDA

<bfr>	integer	0	controls the effect on buffered codes when **<mode>** 1 or 2 is entered.

Values:

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)

Additional info:

- 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: REJECT <PDP_type>, <PDP_addr>

- The network has requested a context reactivation. The **<cid>** that was used to reactivate the context is provided if known to **TA**.

  +CGEV: NW REACT <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: NW_DEACT <PDP_type>, <PDP_addr>, [<cid>]

Not Subject to NDA

- The mobile equipment has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

  +CGEV: ME_DETACH

- The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

  +CGEV: NW_DETACH

- The mobile equipment has forced a change of MS class. The highest available class is reported (see **+CGCLASS**).

  +CGEV: ME CLASS <class>

Unsolicited fields:

Name	Type	Description
<PDP_type>	string	Packet Data Protocol type, which specifies the type of packet data protocol
<PDP_addr>	string	identifies the terminal in the address space applicable to the PDP
<cid>	integer	PDP Context Identifier

AT+CGEREP?

Read command returns the current **<mode>** and **<bfr>** settings, in the format:

Not Subject to NDA

+CGEREP: <mode>,<bfr>

AT+CGEREP=?

Test command reports the supported range of values for the **+CGEREP** command parameters.

Not Subject to NDA

3.9.24. AT+CGATT - PS Attach or Detach

This execution command is used to register (attach) the terminal to or deregister (detach) the terminal from the Packet Domain service.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGATT=<state>

Parameter:

Name	Type	Default	Description
<state>	integer	N/A	state of PS attachment Values: 0 : detached 1 : attached

AT+CGATT?

Read command returns the current PS state in the format:

+CGATT: <state>

AT+CGATT=?

Test command returns the values range of the <**state**> parameter.

Not Subject to NDA

```
AT+CGATT?
+CGATT: 0
OK

AT+CGATT=?
+CGATT: (0,1)
OK

AT+CGATT=1
OK
```


Not Subject to NDA

3.9.25. AT+CGTFT - Traffic Flow Template

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE.

3GPP TS 27.007

3GPP TS 03.60/23.060

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGTFT=[<cid>[,<packet filter identifier>[,<evaluation precedence index>[,<source address and subnet mask>[,<prot num(ipv4)/next hdr(ipv6)>[,<destination port range>[,<source port range>[,<ipsec sec param index (spi)>[,<tos(ipv4) TP class(ipv6)&mask>[,<flow label (ipv6)>]]]]]]]]

The concept further described in the 3GPP TS 23.060 [47]. A TFT consists of from one and up to 16 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

The set command specifies a Packet Filter that whom added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter, <cid>. The specified TFT will be stored in the GGSN in UMTS/GPRS and Packet GW in EPS only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the **+CGDCONT** and **+CGDSCONT** commands, the **+CGTFT** command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value.

A special form of the set command, **+CGTFT= <cid>** causes all of the Packet Filters in the TFT for context number

<cid> to become undefined. At any time there may exist only one PDP context with no associated TFT amongst all

Not Subject to NDA

PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +**CMEE** command.

Possible Response(s):

OK

ERROR

Parameters:

Name	Type	Default	Description
<cid>	integer	-	a numeric parameter which specifies a particular PDP context definition (see the +**CGDCONT** and +**CGDSCONT** commands). The following parameters are defined in 3GPP TS 23.060 [47]:
<packet filter identifier>	integer	-	The value range is from 1 to 16.
<evaluation precedence index>	integer	-	The value range is from 0 to 255.
<source address and subnet mask>	string	-	The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.

Not Subject to NDA

<prot num(ipv4) /next hdr(ipv6) >	integer	-	The value range is from 0 to 255.
<destination port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<source port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<ipsec sec param index (spi)>	integer	-	The value is in hexadecimal format. The value range is from 0 to FFFFFFFF.
<tos(ipv4) TP class(ipv6)&mask>	string	-	The string is given as dot-separated numeric (0-255) parameters on the form "t.m".
<flow label (ipv6)>	integer	-	The numeric value is in hexadecimal format. The value range is from 0 to FFFFF. Valid for IPv6 only.

Additional info:

- Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060 [47].

AT+CGTFT?

The read command returns the current settings for all Packet Filters for each defined context.

Not Subject to NDA

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

AT+CGTFT=?

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be use.

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

The possible combinations listed on 3GPP TS 23.060 [47].

Not Subject to NDA

3.9.26. AT+CGDATA - Enter Data State

This command causes the device to establish a connection with the network. Commands following +CGDATA command in the AT command line shall not be processed by the device.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGDATA=[<L2P>,[<cid>[,<cid>[,....]]]]

Set command causes to perform whatever actions are necessary to establish a communication with the network using one or more GPRS PDP types.

Parameters:

Name	Type	Default	Description
<L2P>	string	-	String parameter that indicates the layer 2 protocol to be used "PPP" - PPP Point-to-point protocol
<cid>	integer	-	Numeric parameter which specifies a particular PDP context definition (see +CGDCONT command)

If parameter <L2P> is omitted, the layer 2 protocol is unspecified

AT+CGDATA=?

Test command reports information on the supported layer 2 protocols.

Not Subject to NDA

- AT+CGDATA=?
  +CGDATA: ("PPP")

  OK

  AT+CGDATA="PPP",1
  OK

Not Subject to NDA

3.9.27. AT+CGEQOSRDP - EPS Quality of Service Read Dynamic Parameters

The command returns the parameters related to the Quality of Service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGEQOSRDP=[<cid>]

The execution command returns the Quality of Service parameters **<QCI>, [<DL_GBR>** and **<UL_GBR>]** and

[<DL_MBR> and <UL_MBR>] of the active secondary or non secondary PDP context associated to the provided context identifier **<cid>**.

If the parameter **<cid>** is omitted, the Quality of Service parameters for all secondary or non secondary active PDP contexts are returned.

Parameter:

Name	Type	Default	Description
<cid>	integer	-	it specifies a particular Traffic Flows definition in EPS and a PDN connection definition in UMTS/GPRS.

Additional info:

Possible Response(s):

+CGEQOSRDP:<cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<CR>>LF>

+CGEQOSRDP:<cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][...]]

Defined values:

Not Subject to NDA

Name	Type	Default	Description
<QCI>	integer	-	specifies a class of EPS QoS. (see 3GPP TS 23.203 [85])0 QCI is selected by network [1..4] value range for guaranteed bit rate Traffic Flows [5..9] value range for non-guaranteed bit rate Traffic Flows.
<DL_GBR>	integer	-	indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])
<UL_GBR>	integer	-	indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])
<DL_MBR>	integer	-	indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])
<UL_MBR>	integer	-	indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

AT+CGEQOSRDP=?

+CGEQOSRDP: (list of <cid>s associated with secondary or non secondary active contexts)

Parameters of both network and MT/TA initiated PDP contexts returned.

Not Subject to NDA

3.9.28. AT+CGTFTRDP - Traffic Flow Template Read Dynamic Parameters

This command returns the relevant information about Traffic Flow Template of <cid> together with the additional network assigned values when established by the network.

3GPP TS 27.007; 3GPP TS 03.60/23.060

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGTFTRDP=[<cid>]

The execution command returns the relevant information about Traffic Flow Template for an active secondary or non secondary PDP context specified by **<cid>** together with the additional network assigned values when established by the network.

If the parameter **<cid>** is omitted, the Traffic Flow Templates for all active secondary and non secondary PDP contexts are returned.

Parameters of both network and MT/TA initiated PDP contexts returned.

Possible Response(s):

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

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

Parameter:

Name	Type	Default	Description

Not Subject to NDA

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

Additional info:

▶▶List of the meaning of the response message parameters.

Name	Type	Default	Description
<packet filter identifier>	integer Value: 1÷16 : supported range	N/A	packet filter identifier
<evaluation precedence index>	integer Value: 0÷255 : supported range	N/A	evaluation precedence index
<source address and subn	string	-	source address and subnet mask The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 **or**

Not Subject to NDA

et mask >			"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6.
<protocol number/next header>	string	N/A	protocol number for ipv4 or next header for ipv6 Value: 0÷255 : supported range
<destination port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t"
<source port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t"
<ipsec spi>	hex	N/A	ipsec security parameter index (spi) in hexadecimal format Value: 00000000÷FFFFFFFF : supported range
<tos/traffic class and	string	-	type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask The string given as dot-separated numeric (0-255) parameters on the form "t.m"

Not Subject to NDA

mask >			
<flow label (ipv6) >	hex	N/A	valid for IPv6 only Value: 00000÷FFFFF : supported range
<direction >	string	N/A	specifies the transmission direction in which the Packet Filter shall be applied Values: 0 : Pre Release 7 TFT Filter (see 3GPP TS 24.008, table 10.5.162) 1 : Uplink 2 : Downlink 3 : Bidirectional (Used for Uplink and Downlink)
<NW packet filter Identifier>	integer	N/A	in EPS the value is assigned by the network when established Value: 1÷16 : supported range

Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations listed on 3GPP TS 23.060 [47].

Not Subject to NDA

AT+CGTFTRDP=?

+CGTFTRDP: (list of <cid>s associated with active secondary or non secondary contexts)

Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each

other. The possible combinations listed on 3GPP TS 23.060 [47].

Not Subject to NDA

3.9.29. AT#PPPCFG - PPP Configuration

This command configures the PPP mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PPPCFG=<mode>

Set command sets the active/passive PPP mode

Parameter:

Name	Type	Default	Description
<mode>	integer	1	sets PPP mode
	Values: 0 : passive mode 1 : active mode		

AT#PPPCFG?

Read command returns the current **<mode>**, in the format:

#PPPCFG: <mode>

AT#PPPCFG=?

Test command returns the range of available values for parameters **<mode>** .

Not Subject to NDA

3.9.30. AT+CGACT - PDP Context Activate or Deactivate

This command activates or deactivates the specified PDP context(s).

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGACT=[<state>[,<cid>[,<cid>][,...]]]

Parameters:

Name	Type	Default	Description
<state>	integer	N/A	activate/deactivate the PDP context Values: 0 : deactivate 1 : activate
<cid>	integer	-	specifies a PDP context definition (see **+CGDCONT** command)

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:

Not Subject to NDA

+CGACT: <cid>,<state>[<CR><LF>
+CGACT: <cid>,<state>[...]]

AT+CGACT=?

Test command reports information on the supported PDP context activation states <state>.

AT+CGACT=1,1
OK

AT+CGACT?
+CGACT: 1,1

OK

Not Subject to NDA

3.9.31. AT+CGDSCONT - Define Secondary PDP Context

Define secondary PDP Context.

[1] 3GPP TS 44.065
[2] 3GPP TS 25.323
[3] RFC1144
[4] RFC2507
[5] RFC3095

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CGDSCONT=[<cid> ,<p_cid> [,<d_comp>[,<h_comp>]]]

Set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context Identification parameter, **<cid>**.

The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

In EPS the command is used to define traffic flows.

A special form of the set command, **+CGDSCONT= <cid>** causes the values for context number **<cid>** to become undefined.

The read command returns the current settings for each defined context.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

Not Subject to NDA

<p_cid>	integer	-	a numeric parameter which specifies a particular PDP context definition which has been specified by use of the **+CGDCONT** command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.
<d_comp>	integer	0	controls PDP data compression (applicable for SNDCPonly) (refer 3GPP TS 44.065 [61]) Values: 0 : off 1 : on(manufacturer preferred compression) 2 : V.42 bis
<h_comp>	integer	0	controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]). Values: 0 : off 1 : on(manufacturer preferred compression) 2 : RFC1144 (applicable for SNDCP only) 3 : RFC2507 4 : RFC3095 (applicable for PDCP only)

AT+CGDSCONT?

The read command returns the current settings for each defined context in the format:

+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>[<CR><LF>
+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp> [...]]

Not Subject to NDA

AT+CGDSCONT=?

Test command returns the supported range of values of parameters.

Not Subject to NDA

3.9.32. AT+CGSCONTRDP - Secondary PDP Context Read Dynamic Parameters

This command returns parameters for a given **<cid>**.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CGSCONTRDP[=<cid>]

The execution command returns **<p_cid>** and **<bearer_id>** parameters for a given **<cid>**. If the context cannot be found an **ERROR** response is returned. If the parameter **<cid>** is omitted, the **<cid>**, **<p_cid>** and **<bearer_id>** are returned for all established PDP contexts. Format of the returned message:

+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[<CR><LF>
+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[...]]

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands.

Additional info:

Here is the list of the parameters meanings returned by the **+CGSCONTRDP** command.

Name	Type	Default	Description
<p_cid>	integer	-	specifies a particular PDP context definition or default EPS context Identifier which has been specified by use of the

Not Subject to NDA

			+CGDCONT command. The parameter is local to the TE-MT interface.
<bearer_id>	integer	-	identifies the bearer, EPS Bearer in EPS and NSAPI in GPRS.

AT+CGSCONTRDP=?

The test command returns a list of <cid>s associated with active contexts:

+CGSCONTRDP: (list of <cid>s associated with active contexts)

Parameters for network-initiated PDP contexts returned as well. The dynamic part of the PDP context will only exist if established by the network.

Not Subject to NDA

3.9.33. AT+CGREG - GPRS Network Registration Status

Set command controls the presentation of the **+CGREG:** unsolicited result code

3GPP TS 27.007
3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CGREG=[<mode>]

Set command enables/disables the **+CGREG:** unsolicited result code, and selects one of the available formats:

short format:
+CGREG:<stat>

long format:
+CGREG:<stat>[,<lac>,<ci>[,<AcT>,<rac>]]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the network registration unsolicited result code (URC), and selects one of the available formats. The following events trigger the URC: URC short format is displayed every time there is a change in the network registration status. URC long format is displayed, according to **<mode>** value, every time there is a change of the network cell.

Not Subject to NDA

Values:

0 : disable the network registration unsolicited result code

1 : enable the network registration unsolicited result code, and selects the short format

2 : enable the network registration unsolicited result code, and selects the long format (includes the network cell identification data)

Unsolicited fields:

Name	Type	Description
<stat>	integer	registration status of the module Values: 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
<lac>	string	the parameter reports: Local Area Code when **<AcT>**=0 or 2 Tracking Area Code when **<AcT>**=7
<ci>	string	cell ID in hexadecimal format
<AcT>	integer	access technology of the registered network. Values: 0 : GSM

Not Subject to NDA

	2	:	UTRAN
	7	:	E-UTRAN
<rac>	string	routing area code (one byte) in hexadecimal format Routing Area Code when **<AcT>**=0 or 2 Mobile Management Entity code when **<AcT>**=7	

<lac>, **<ci>**, **<AcT>**, and **<rac>** network information is reported by URC only if <**mode**>=2, and the module is registered on some network cell.

<lac> and **<rac>** values will change **<tac>** and **<mme_code>** values in LTE.

AT+CGREG?

Read command returns the current value of <**mode**>, the registration status <**stat**>, and the network information (**<lac>**, **<ci>**, **<AcT>**, and **<rac>**) according to the used <**mode**> parameter value.

+CGREG: <mode>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]]

<lac>, **<ci>**, **<AcT>**, and **<rac>** network information is reported only if <**mode**>=2 or 4 and the module is registered on some network cell.

<lac> and<rac> values will change <tac> and <mme_code> values in LTE.

AT+CGREG=?

Test command returns supported values for parameter <**mode**>.

Not Subject to NDA

3.9.34. AT#SINGLEAPNSWITCH - set APN param change

This command sets APN param change.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SINGLEAPNSWITCH=<mode>

If it is enabled and an APN network identifier or APN-related parameter is updated, Modem can re-activate PDN context with changed APN if there are no application working on the activated PDN context and APN name is changed. If the PDN context is for LTE attach, UE will attempt to reattach with changed APN. In other systems, this command works as if it is disabled.

If it is disabled, the changed APN will go into effect at the moment when the PDN context is deactivated and then re-activated. Power recycling is one of operations that will have new APN activated.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Set enable or disable
	Values: 0 : Disable 1 : Enable		

Value set by command is directly stored in NVM and available at next reboot.

default value is depended on network vendor. VZW/TELSTRA is 1.

no application means that user did not use #SGACT=1,1.

Not Subject to NDA

AT#SINGLEAPNSWITCH?

Read command reports current configuration.

AT#SINGLEAPNSWITCH=?

Test command reports the supported range of values.

Not Subject to NDA

3.10. SIM

3.10.1. AT+CPIN - Enter the PIN

The command sends to the device a password which is necessary before it can be operated.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	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. The **<newpin>** will replace the old pin in the SIM.

Parameters:

Name	Type	Default	Description
<pin>	string	-	PIN required or old PIN if the command is used to change the SIM PIN
<newpin>	string	-	new PIN that will replace old pin

AT+CPIN?

Read command reports the PIN/PUK/PUK2 request status of the device in the form:

+CPIN: <code>

Additional info:

Not Subject to NDA

▶▶ Parameters:

Name	Type	Default	Description
<code>	string	N/A	PIN/PUK/PUK2 request status code

Values:

READY	:	ME is not pending for any password
SIM PIN	:	ME is waiting SIM PIN to be given
SIM PUK	:	ME is waiting SIM PUK to be given
PH-SIM PIN	:	ME is waiting phone-to-SIM card password to be given
PH-FSIM PIN	:	ME is waiting phone-to-very first SIM card password to be given
PH-FSIM PUK	:	ME is waiting phone-to-very first SIM card unblocking password to be given
SIM PIN2	:	ME is waiting SIM PIN2 to be given; this <code> is returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17)
SIM PUK2	:	ME is waiting SIM PUK2 to be given; this <code> is returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18)

Not Subject to NDA

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

Pin pending status at startup depends on PIN facility setting; to change or query the default power up setting use the command **AT+CLCK**.

AT+CPIN=?

Test command returns **OK** result code.

Not Subject to NDA

```
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 module is not waiting for PIN
OK
```


Not Subject to NDA

3.10.2. AT+CPINR - Remaining PIN Retries

This command returns the number of remaining PIN retries for the MT passwords.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CPINR[=[<sel_code>]]

Execution command cause the MT to return the number of remaining PIN retries for the MT passwords.

The intermediate response format is:

+CPINR: <code>,<retries>,<default_retries>

Parameter:

Name	Type	Default	Description
<sel_code>	string	-	These values are strings and shall be indicated within double quotes. It is optional to support wildcard match by '*', meaning match any (sub-)string.

Additional info:

- One line with one intermediate result code is returned for every <**code**> selected by <**sel_code**>.

Name	Type	Default	Description

Not Subject to NDA

<code>	string	-	type of PIN
<retries>	integer	-	number of remaining retries per PIN
<default_retries>	integer	-	number of default/initial retries per PIN

AT+CPINR=?

Test command returns the **OK** result code.

```
AT+CPINR="SIM*"
+CPINR: SIM PIN,3,3
+CPINR: SIM PUK,10,10
+CPINR: SIM PIN2,0,3
+CPINR: SIM PUK2,2,10

OK
AT+CPINR="*SIM*"
+CPINR: SIM PIN,3,3
+CPINR: SIM PUK,10,10
+CPINR: SIM PIN2,0,3
+CPINR: SIM PUK2,2,10
+CPINR: PH-FSIM PIN,10,10
+CPINR: PH-FSIM PUK,0,0

OK
```


Not Subject to NDA

3.10.3. AT#PCT - Display PIN Counter

This command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, if **+CPIN** password is required.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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>

Additional info:

- Here is shown the parameter meaning.

Name	Type	Default	Description
<n>	integer	N/A	remaining attempts.

Values:

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.

Not Subject to NDA

AT+CPIN?
+CPIN: SIM PIN
OK

AT#PCT *Check PIN remained counter*
#PCT: 3
OK

AT+CPIN=1111 *Input incorrect PIN number*
+CME ERROR: incorrect password

AT#PCT
#PCT: 2
OK

Not Subject to NDA

3.10.4. AT+ICCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+ICCID

The command returns the following message:

+ICCID: <ICCID>

AT+ICCID=?

Test command returns the **OK** result code.

</>

AT+ICCID

+ICCID: 89861109091740011006

OK

Not Subject to NDA

3.10.5. AT+CIMI - International Mobile Subscriber Identity (IMSI)

This command returns the International Mobile Subscriber Identity (IMSI).

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CIMI

Execution command returns the value of the International Mobile Subscriber Identity stored in the SIM without command echo.

If the SIM is not inserted, the command returns **ERROR**.

AT+CIMI=?

Test command returns **OK** result code.

```
AT+CIMI
222017012025O7
OK
```


Not Subject to NDA

3.10.6. AT#CIMI - International Mobile Subscriber Identity (IMSI)

This command returns the International Mobile Subscriber Identity (IMSI).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CIMI

Execution command returns the value of the International Mobile Subscriber Identity stored in the SIM with command echo.

If the SIM is not inserted, the command returns **ERROR**.

AT#CIMI=?

Test command returns the **OK** result code.

```
AT#CIMI
#CIMI: 450050209516643
OK
```


Not Subject to NDA

3.10.7. AT+CRSM - Restricted SIM access

The command transmits to the UICC some specific commands and their required parameters.

3GPP TS 11.11/51.011

3GPP TS 27.007

ETSI TS 102 221

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CRSM=<command>[,<fileId>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]

Set command transmits to the MT the SIM <**command**> and its required parameters. The MT handles internally all SIM-MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. The response of the command is in the format:

+CRSM: <sw1>,<sw2>[,<response>]

For parameters meanings see Additional info section.

Parameters:

Name	Type	Default	Description
<command>	integer	N/A	command passed on by the MT to the SIM
	Values:		
	176 :	READ BINARY	

Not Subject to NDA

178 : READ RECORD

192 : GET RESPONSE

214 : UPDATE BINARY

220 : UPDATE RECORD

242 : STATUS

<fileId>	integer	-	identifier of an elementary data file on SIM. Mandatory for every command except STATUS.
<P1>	integer	N/A	parameter passed on by the MT to the SIM. It is mandatory for every command except GET RESPONSE and STATUS. Value: 0÷255 : parameter passed on by the MT to the SIM
<P2>	integer	N/A	parameter passed on by the MT to the SIM. It is mandatory for every command except GET RESPONSE and STATUS. Value: 0÷255 : parameter passed on by the MT to the SIM
<P3>	integer	N/A	parameter passed on by the MT to the SIM. It is mandatory for every command except GET RESPONSE and STATUS. Value: 0÷255 : parameter passed on by the MT to the SIM
<data>	string	-	information which shall be written to the SIM (hexadecimal character format).

Not Subject to NDA

<pathid>	string	-	contains the path of an elementary file on the SIM/UICC in hexadecimal format. This shall only be used in the mode "select by path from MF" (e.g. "7F205F70").

Additional info:

- Response data fields:

Name	Type	Default	Description
<sw1>	integer	-	information from the SIM about the execution of the actual command (successful or failed)
<sw2>	integer	-	information from the SIM about the execution of the actual command (successful or failed)
<response>	hex	-	response of a successful completion of the command previously issued (hexadecimal character format). STATUS and GET RESPONSE return data, which gives information about the current elementary data field. This information includes the type of file and its size. After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned. <**response**> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command.

Not Subject to NDA

Use only decimal numbers for parameters <command>, <fileid>, <P1>, <P2> and <P3>.

AT+CRSM=?

Test command returns the **OK** result code.

Not Subject to NDA

Read binary, ICCID(2FE2)

AT+CRSM=176,12258,0,0,10
+CRSM: 144,0,982850702001107686F4
OK

Read record, ADN(6F3A)

AT+CRSM=178,28474,1,4,40
+CRSM:
144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFF06811056789282FFFFFFFFFFFFFF
OK

Update Binary, KcGPRS(6F52)

AT+CRSM=214,28539,0,0,8,C69018C7958C87
+CRSM: 144,0
OK

Update Record, ADN(6F3A)

AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFF FFFFFFFFFFF
+CRSM: 144,0
OK

Status, FPLMN(6F7B)

AT+CRSM=242,28539
+CRSM:144,0,623C820238218410A0000000871002FFFFFFFF89040300FFA511800131
81030 10A3282011E8304000030E08A01058B032F0609C6099001C0830101830181
OK

Get Response, MSISDN(6F40)
AT+CRSM=192,28480
+CRSM:
144,0,621E8205422100260283026F40A5039201008A01058B036F06058002004C8800
OK

Not Subject to NDA

3.10.8. AT+CSIM - Generic SIM Access

This command sends a generic command to the UICC.

[1] 3GPP TS 11.11
[2] 3GPP TS 31.101
[3] 3GPP TS 31.102

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CSIM=<length>,<command>

Set command transmits to the MT the <**command**>, it then shall send as it is to the SIM. As response to the command, MT sends back the actual UICC **<response>** to the TA as it is. The response message of the command is in the format:

+CSIM: <length>,<response>

Error case:
+CME ERROR: <err>

The response messages parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<length>	integer	-	characters number of the <**command**> sent to UICC (two times the actual length of the command)
<command>	string	-	command passed on by the MT to the UICC in the format as described in

Not Subject to NDA

	3GPP TS 51.011 (hexadecimal character format, refer to **+CSCS**)

Additional info:

- List of the meaning of the response messages parameters.

Name	Type	Default	Description
<length>	integer	-	characters number of the <**response**> sent to TE (two times the actual length of the response)
<response>	string	-	response to the command passed on by the UICC to the TE in the format as described in 3GPP TS 51.011 (hexadecimal character format; refer **+CSCS**)
<err>	string	-	error values (numeric format followed by verbose format)

AT+CSIM=?

Test command returns the **OK** result code.

AT+CSIM=<lock>

This special form of the command has no effect and is kept only for backward compatibility.

Parameters:

<**lock**>=1 locking of the interface
<**lock**>=0 unlocking of the interface

Not Subject to NDA

- 2G SIM, see standard [1]:

STATUS
AT+CSIM=10,A0F2000016
+CSIM:48,"000002A87F2002000000000009930022080083 8A838A9000"
OK

SELECT EF 6F07
AT+CSIM=14,A0A40000026F07
+CSIM: 4,"9F0F"
OK

GET RESPONSE
AT+CSIM=10,A0C000000F
+CSIM: 34,"000000096F0704001A001A010200009000"
OK

SELECT EF 6F30
AT+CSIM=14,A0A40000026F30
+CSIM: 4,"9F0F"
OK

READ BINARY
AT+CSIM=10,A0B00000FC
+CSIM:508,"FFFFFF1300831300901300541300301300651300381300801301801
3000113110913013013009813007713005913004313008113009513014013002313
0016330420130041FFFFFFFFFFFF21436542F41922F28822F201FFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFF9000"
OK

Not Subject to NDA

3.10.9. AT+CCHO - Open Logical Channel

Open Logical Channel

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CCHO=<dfname>

Execution 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 <**sessionId**> as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel.

The response message of the command is in the format:
+CCHO: <sessionId>

The <**sessionId**> is described in the Additional info section.

Error case:
+CME ERROR: <err>

Parameter:

Name	Type	Default	Description
<dfname>	string	-	all selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes

Not Subject to NDA

Additional info:

▸▸ Response parameter

Name	Type	Default	Description
<sessionId>	integer	-	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

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.

This <**sessionId**> is to be used when sending commands with Generic UICC Logical Channel access **+CGLA** commands.

AT+CCHO=?

Test command returns the **OK** result code.

Not Subject to NDA

3.10.10. AT+CCHC - Close Logical Channel

Close Logical Channel

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CCHC=<sessionId>

Execution 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.

Error case:

+CME ERROR: <err>

Parameter:

Name	Type	Default	Description
<sessionId>	integer	-	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

AT+CCHC=?

Test command returns the **OK** result code.

Not Subject to NDA

3.10.11. AT+CGLA - Generic UICC Logical Channel Access

This command is used to control the currently selected UICC on the TE.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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 the received UICC information.

The response of the command is in the format:

+CGLA: <length>,<response>

Error case:

+CME ERROR: <err>

The response messages parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<sessionId>	integer	-	the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory to send commands to the UICC when targeting

Not Subject to NDA

			applications on the smart card using a logical channel other than the default channel (channel "0").
<length>	integer	-	length of the characters that are sent to TE in <**command**> (two times the actual length of the command)
<command>	string	-	command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format; refer **+CSCS**).

Additional info:

▶▶ List of the meaning of the response messages parameters.

Name	Type	Default	Description
<length>	integer	-	length of the characters that are sent to TE in the <**response**> (two times the actual length of the response)
<response>	string	-	response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 (hexadecimal character format; refer **+CSCS**).
<err>	string	-	error values (numeric format followed by verbose format)

AT+CGLA=?

Test command returns the **OK** result code.

Not Subject to NDA

3.10.12. AT+CUAD - UICC Application Discovery

This command asks the MT to discover what applications are available for selection on the UICC.

3GPP TS 27.007

ETSI TS 102.221

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT+CUAD

This command asks the MT to discover what applications are available for selection on the UICC. The ME shall access and read the EF_{DIR} file in the UICC and return the values that are stored in the records.

Response syntax:

+CUAD: <response>

The parameter is described in the Additional info section.

Additional info:

- the parameter meaning

Name	Type	Default	Description
<response>	string	-	the content of the EF_{DIR}; hexadecimal character format

Not Subject to NDA

AT+CUAD=?

Test command returns the **OK** result code.

Not Subject to NDA

3.10.13. AT#CCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CCID

The command returns the following message:

#CCID: <ICCID>
OK

AT#CCID=?

Test command returns the **OK** result code.

AT#CCID
#CCID: 89861109091740011006
OK

Not Subject to NDA

3.10.14. AT#SIMPR - SIM Presence Status

The command enables/disables the SIM presence status unsolicited indication.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	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 SIM Access Profile (SAP) functionality is supported and has been enabled by **AT#RSEN** command.

If notification is enabled, the ME informs about every (local and remote) SIM status changes through the following URC:

#SIMPR: <SIM>,<status>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	notification type
	Values:		
	0 : disabled		
	1 : enabled		

Unsolicited fields:

Name	Type	Description
<SIM>	integer	local or remote SIM
	Values:	
	0 :	local SIM
	1 :	remote SIM

Not Subject to NDA

<status>	integer	current SIM status	
		Values:	
		0	: SIM not inserted
		1	: SIM inserted

Entering **AT#SIMPR=** returns **OK** but has no effect.

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 is always 0.

AT#SIMPR=?

Test command reports the supported range of values for the parameter **<mode>**.

Not Subject to NDA

3.10.15. AT#QSS - Query SIM Status

Query SIM Status.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#QSS=[<mode>]

Set command enables/disables the Query SIM Status unsolicited indication in the ME. The format of the unsolicited indication is the following:

#QSS: <status>

The parameter is described in the Unsolicited field section.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Type of notification

Values:

0 : disabled. It is only possible to query the current SIM status through read command AT#QSS?

1 : enabled. The ME informs at every SIM status change through the unsolicited indication where <status> range is 0...1

2 : enabled. The ME informs at every SIM status change through the unsolicited indication where <status> range is 0...3

Unsolicited field:

Name	Type	Description

Not Subject to NDA

<status>	integer	current SIM status Values: 0 : SIM not inserted 1 : SIM inserted 2 : SIM inserted and PIN unlocked 3 : SIM inserted and READY (SMS and Phonebook access are possible)

The command reports the SIM status change after the <**mode**> has been set to 2.

It is strongly suggested to set <**mode**>=2 and save the value in the user profile, then power off the module. The proper SIM status will be available at the next power on.

AT#QSS?

Read command reports whether the unsolicited indication **#QSS** is currently enabled or not, along with the SIM status, in the format:

#QSS: <mode>,<status>

The parameters are described in the previous sections.

AT#QSS=?

Test command returns the supported range of values for parameter <**mode**>.

Not Subject to NDA

3.10.16. AT#SIMSELECT - SIM Slot Switch

SIM Slot Switch

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SIMSELECT=<slot>

Set command selects to activate one of the two SIM slots to support Dual SIM Single Standby (DSSS).

Parameter:

Name	Type	Default	Description
<slot>	integer	1	SIM slot
	Values: 1 : SIM slot 1 2 : SIM slot 2		

To select SIM slot 2 on LE910Cx series, SIM slot 2 must be activated by **AT#ENSIM2** command (**AT#ENSIM2=1**).

AT#SIMSELECT?

Read command reports the activate SIM slot, in the format:

#SIMSELECT: <slot>

AT#SIMSELECT=?

Not Subject to NDA

Test command reports the supported range of values for parameter <slot>.

Not Subject to NDA

3.10.17. AT#RSEN - Remote SIM Enable

This command used to enable or disable the remote SIM feature.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#RSEN=<mode>[,<sap_format>,<role>,<port>,<beacon>]

Set command enables/disables the Remote SIM feature.

If the status of the remote SIM changes, then the status is shown with the following URC:

#RSEN: <conn>

<**conn**> parameter is described in Unsolicited fields section.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	mode Values: 0 : disable 1 : enable
<sap_format>	integer	1	SAP format Value: 1 : binary SAP
<role>	integer	0	client or server role Value: 0 : remote SIM client

Not Subject to NDA

<port>	integer	1	mandatory if <**mode**> is 1 and <**sap_format**> is 1 Value: 1 : dummy value
<beacon>	integer	0	retransmission timer of SAP connection request Value: 0÷100 : timer interval in seconds (dummy value)

Unsolicited field:

Name	Type	Description
<conn>	integer	connection status Values: 0 : disconnected 1 : connected

AT#RSEN?

Read command returns the connection status of the remote SIM, in the format:

#RSEN: <conn>

AT#RSEN=?

Test command reports the supported range of values for parameters <**mode**>, <**sap_format**>, <**role**>, <**port**> and <**beacon**>.

Not Subject to NDA

This command is not supported in the following models.

- LE910C1-SA/SV/ST
- LE910C1-EUX/SVX/SAX
- LE910Cx-WWX

To connect the remote SIM

AT#RSEN=1,1,0,1,0

OK

#RSEN: 1

To disconnect the remote SIM

AT#RSEN=0

OK

#RSEN: 0

Not Subject to NDA

3.10.18. AT#ENSIM2 - Enable SIM Slot2

This command enables/disables SIM slot2.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENSIM2=<mode>

Set command enables/disables SIM slot2.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	mode Values: 0 : disable 1 : enable

The new setting is applied to next boot.

In LE910Cx-AP/EU/NF, LE910C1-NA/NS and LE910C1-EUX, the default value of the parameter **<mode>** is 0. The default value of all other models is 1.

AT#ENSIM2?

Read command reports the status of SIM slot2, in the format:

#ENSIM2: <mode>

Not Subject to NDA

AT#ENSIM2=?

Test command reports the supported range of values for parameter <mode>.

Not Subject to NDA

3.10.19. AT#HSEN - Hot-Swap Enable

This command enables/disables the hot-swap function.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#HSEN=<mode>

Set command enables/disables the hot-swap function.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	hot-swap mode
	Values: 0 : disable 1 : enable		

AT#HSEN?

Read command reports the hot-swap status, in the format:

#HSEN: <mode>

AT#HSEN=?

Test command reports the supported range of values for parameter **<mode>**.

Not Subject to NDA

- If SIMIN pin is not connected, the hot-swap function cannot be supported.
- The changed setting is applied to the next boot.
- Please set as disable if you want not to use this feature.

SIMIN pin is connected and SIM is inserted.

AT#HSEN?

#HSEN: 1

OK

AT#SIMPR?

#SIMPR: 1,0,1

#SIMPR: 1,1,0

OK

Remove SIM card.

#SIMPR: 0,0

Insert SIM card.

#SIMPR: 0,1

Not Subject to NDA

3.10.20. AT#SIMINCFG - SIMIN Pin Configuration

This command allows to set the SIMIN pin status for SIM detection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SIMINCFG=<GPIOPin>,<siminDetMode>

Set command sets SIMIN pin status for SIM detection.

Parameters:

Name	Type	Default	Description
<GPIOPin>	integer	-	number of the GPIO pin used as SIMIN pin. Actually, it is a dummy parameter that is not used.
<siminDetMode>	integer	0	status of SIMIN pin for SIM detection Values: 0 : SIMIN pin LOW means SIM inserted. HIGH means SIM removed. 1 : SIMIN pin LOW means SIM removed. HIGH means SIM inserted.

AT#SIMINCFG?

Read command reports the selected SIMIN pin status in the format:

#SIMINCFG: 0,<siminDetMode>

AT#SIMINCFG=?

Not Subject to NDA

Test command reports the supported range of value for parameters <**GPIOPin**> and <**siminDetMode**>.

If SIMIN pin is not connected, the hot-swap function cannot be supported.

Not Subject to NDA

3.10.21. AT#ESIMID - Provides the EUICC ID

This command provides the unique ID number for the eUICC card present in the slot.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ESIMID=<slot>

Set command provides the unique ID number for the eUICC card present in the slot.

Parameter:

Name	Type	Default	Description
<slot>	integer	N/A	Slot for which the EID is requested Values: 1 : Slot 1 2 : Slot 2

Additional info:

Response:

#ESIMID: <eid_value>

Name	Type	Default	Description
<eid_value>	hex	-	The EID value

AT#ESIMID=?

Test command reports the supported range of values for parameters **<slot>**

Not Subject to NDA

3.10.22. AT#ESIMPF - Manage the profiles

This command queries, switches or deletes the profiles supported by the card.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#ESIMPF=<mode>,<slot>[,<profile_id>[,<enable_profile>]]

Set command queries, switches or deletes the profiles supported by the card. The response contains a list of profiles supported by the card and profile information of the currently active profile.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	mode information Values: 0 : queries the profiles 1 : switches the profiles 2 : deletes the profiles
<slot>	string	N/A	Slot information Values: 1 : Slot 1 2 : Slot 2
<profile_id>	integer	N/A	profile ID information Values: 1 : profile 1 2 : profile 2

Not Subject to NDA

		3 : profile 3 4 : profile 4 5 : profile 5 6 : profile 6 7 : profile 7 8 : profile 8	
<enable_profile>	integer	N/A	Profile enable or not Values: 0 : disable the profile 1 : enable the profile

Additional info:

- If you want queries the profile, only two parameters **<mode>** and **<slot>** are needed. The return value is as follow.

  Response about queries the profile:

  #ESIMPF: <profile_id>,<profile_type>

Name	Type	Default	Description
<profile_type>	integer	N/A	Profile type information Values: 0 : Profile type regular 1 : Profile type emergency

- If you want deletes the profile, only three parameters **<mode>**, **<slot>** and **<profile_id>** are needed. The return value is **OK** or **ERROR**.

Not Subject to NDA

▶▶ If you want switches the profile, all parameters are needed. The return value is OK or ERROR.

AT#ESIMPF=?

Test command reports the supported range of values for parameters **<mode>,<slot>,<profile_id>,<enable_profile>**

Profile query:

AT#ESIMPF=0,1

#ESIMPF: 1,0

#ESIMPF: 2,0

OK

Switches the profile:

AT#ESIMPF=1,1,2,1

OK

Deletes the profile:

AT#ESIMPF=2,1,1

OK

Not Subject to NDA

3.10.23. AT#ESIMPFINFO - Provides the profile data

This command provides the profile data for the profile ID.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#ESIMPFINFO=<slot>,<profile_id>

Set command provides the profile data for the profile ID in request.

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Slot information Values: 1 : Slot 1 2 : Slot 2
<profile_id>	integer	N/A	Profile ID information Values: 1 : profile 1 2 : profile 2 3 : profile 3 4 : profile 4 5 : profile 5 6 : profile 6 7 : profile 7 8 : profile 8

Not Subject to NDA

Additional info:

▶▶ Response:

#ESIMPFINFO: <iccid>,<profile_state>,<profile_nickname>,<profile_spn>,<profile_name>,<profile_class>,<profile_rules>

Name	Type	Default	Description
<iccid>	integer	-	Card identification number
<profile_state>	integer	N/A	Profile state information Values: 0 : inactive profile 1 : active profile
<profile_nickname>	string	-	Nickname of profile
<profile_spn>	string	-	The profile service provider
<profile_name>	string	-	Name of profile
<profile_class>	integer	N/A	Profile class information Values: 0 : Test profile 1 : Provisioning profile 2 : Operational profile
<profile_rules>	integer	-	Indicates the profile policy rules applicable for this profile. If this parameter is missing, it indicates there is no profile policy rule associated with this profile.

Not Subject to NDA

AT#ESIMPFINFO=?

Test command reports the supported range of values for parameters **<slot>,<profile_id>**

Not Subject to NDA

3.10.24. AT#ESIMUPN - Updates the nickname

This command updates the nickname of the requested profile.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#ESIMUPN=<slot>,<profile_id>,<nickname>

Set command updates the nickname of the requested profile. If the nickname is missing or has zero length, the nickname is removed from profile.

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Slot information Values: 1 : Slot 1 2 : Slot 2
<profile_id>	integer	N/A	Profile ID information Values: 1 : profile 1 2 : profile 2 3 : profile 3 4 : profile 4 5 : profile 5 6 : profile 6 7 : profile 7

Not Subject to NDA

	8 : profile 8		
<nickname>	string	-	Nickname information, supported 0 ~ 64 character string.

AT#ESIMUPN=?

Test command reports the supported range of values for parameters **<slot>**,**<profile_id>**.

Not Subject to NDA

3.10.25. AT#ESIMGETADDR - Configures the default SM-DP+ address

This command configures the default SM-DP+ address on the eUICC.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#ESIMGETADDR=<slot>[,<default_smdp_addr>]

Set command configures the default SM-DP+ address on the eUICC.

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Slot information Values: 1 : slot 1 2 : slot 2
<default_smdp_addr>	string	-	Support 0 ~ 255 character string. Indicates the address that must be configured on the eUICC as the default SM-DP+ address.

Additional info:

- If **<default_smdp_addr>** is set to 0, the command removes the default SM-DP+ address from the eUICC.

- If the default SM-DP+ address is missing, the command retrieves the default SM-DS address configured on the eUICC. It can also return the default SM-DP+ address if it is configured on the eUICC.

  Response:

Not Subject to NDA

#ESIMGETADDR: <default_smds_address>,<default_smdp_addr>

Name	Type	Default	Description
<default_smds_address>	string	-	default SM-DS address

AT#ESIMGETADDR=?

Test command reports the supported range of values for parameters <slot>.

Not Subject to NDA

3.10.26. AT#ESIMCAP - Sets or gets the terminal capability

This command allows the client to set the contents of the TERMINAL CAPABILITY command that is sent to the card as part of card initialization procedure.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#ESIMCAP=<slot>[,<tag>,<value>,<remove_tlv>]

Set command allows the client to set the contents of the TERMINAL CAPABILITY command that is sent to the card as part of card initialization procedure. The configuration set by this command is applicable only from the next card initialization.

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Slot information Values: 1 : Slot 1 2 : Slot 2
<tag>	integer	N/A	Terminal capability tag, according to ETSI TS 102.221. The service allows the client to update only certain tags including Values: 82 : additional interface support 83 : eUICC-related capabilities
<value>	integer	-	Value of the terminal capability.
<remove_tlv>	integer	N/A	Indicates whether this TLV should be removed from the terminal capability

Not Subject to NDA

		that is sent to the card. When this is set to TRUE, the value field is ignored. Values: 0 : not remove the terminal capability 1 : remove the terminal capability, the value field is ignored

Additional info:

- In case **<tag>** is '82':

Name	Type	Default	Description
<value>	integer	N/A	Value of the terminal capability. Values: 0 : UICC-CLF interface according to ETSI TS 102.613 not supported 1 : UICC-CLF interface according to ETSI TS 102.613 supported

- In case **<tag>** is '83':

Name	Type	Default	Description
<value>	integer	N/A	unsigned Integer used as a bit field, according to GSMA SGP.22 0 ... 255 - used as a bit field: **bit1:** 0 - Local User Interface in the Device (LUId) not supported 1 - Local User Interface in the Device (LUId) supported

Not Subject to NDA

bit2:

0 - Local Profile Download in the Device (LPDd) not supported

1 - Local Profile Download in the Device (LPDd) supported

bit3:

0 - Local Discovery Service in the Device (LDSd) not supported

1 - Local Discovery Service in the Device (LDSd) supported

bit4:

0 - LUIe based on SCWS not supported

1 - LUIe based on SCWS supported

bit5 to 8: reserved for future.

Value:

0÷255 : eUICC-related capabilities

▶▶ If there is only **<slot>** parameter in set command, this command returns Terminal Capability set in card as follows:

Response:

#ESIMCAP: <terminal_cap_len>,< tag >,<value>,<tag>,<value> .....

Name	Type	Default	Description
<terminal_cap_len>	integer	-	number of sets of **<tag>** and **<value>**
<tag>	integer	N/A	Terminal capability tag, according to ETSI TS 102.221. The service allows the client to

Not Subject to NDA

			update only certain tags including. Values: 80 : Terminal power supply 81 : Extended logical channels terminal support 82 : additional interface support 83 : eUICC-related capabilities
<value>	mixed	-	In case **<tag>** is '80': **<value>** - Hex value, within the constructed TLV object. **First byte** - Actual used supply voltage class **Second byte** - Maximum available power supply of the terminal ('0A' to '3C') **Third byte** - Actual used clock frequency ('0A' to 'FF') In case **<tag>** is '81': **<value>** - The extended logical channels terminal support TLV with zero length. In order to allow future extension of this TLV.

AT#ESIMCAP=?

Not Subject to NDA

Test command reports the supported range of values for parameters **<slot>**,**<tag>**,**<remove_tlv>**.

Not Subject to NDA

3.10.27. AT#ESIMPFUC - Provides the user consent

This command provides the user consent to the service which is required for proceeding with the profile download/installation operation after receiving a UIM_ADD_PROFILE_IND indication with status set to UIM_PROFILE_USER_CONSENT_REQUIRED.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ESIMPFUC=<slot>,<user_consent>

Set command provides the user consent to the service which is required for proceeding with the profile download/installation operation after receiving a UIM_ADD_PROFILE_IND indication with status set to UIM_PROFILE_USER_CONSENT_REQUIRED.

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Slot information Values: 1 : Slot 1 2 : Slot 2
<user_consent>	integer	N/A	User consent information Values: 0 : Not OK for profile operation 1 : OK for profile operation

AT#ESIMPFUC=?

Not Subject to NDA

Test command reports the supported range of values for parameters **<slot>**,**<user_consent>**.

Not Subject to NDA

3.10.28. AT#ESIMADDPF - Allows download a new profile

This command allows the eUICC card to download a new profile based on the activation code and confirmation code provided.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ESIMADDPF=<slot>,<act_code>[,<conf_code>[,<user_consent>]]

Set command allows the eUICC card to download a new profile based on the activation code and confirmation code provided.

Parameters:

Name	Type	Default	Description
<slot>	integer	1	Slot information Values: 1 : Slot 1 2 : Slot 2
<act_code>	string	-	Indicated the activation code required for downloading a profile.
<conf_code>	string	-	Indicated the confirmation code required for downloading a profile.
<user_consent>	integer	0	Indicates whether the control point is able to support a request for consent from the user. Values: 0 : User consent not supported 1 : User consent supported

Additional info:

Not Subject to NDA

▶▶Indication during profile download:

#ESIMADDPF: <slot>,<status>[,<error_cause>,<percentage>,<pp_rule>,<user_consent_needed>]

Unsolicited fields:

Name	Type	Description
<slot>	integer	Slot information
<status>	integer	Indicates the status of profile download and install. Values: 1 : Profile download error 2 : Profile download in progress with download percentage. 3 : Profile download is complete, and installation is in progress. 4 : Profile installation is complete. 5 : User consent is required for proceeding with download/installation of profile.
<error_cause>	integer	Indicates the cause of the download error. Values: 1 : Profile download generic error. 2 : Profile download error from the SIM card. 3 : Profile download error from the network.

Not Subject to NDA

		4 : Profile download error no memory on terminal. 5 : Profile download error unsupported profile class. 6 : Profile download error profile policy rules not allowed.
<percentage>	integer	Percentage of download/installation done.
<pp_rule>	integer	Indicates the profile policy rules for this profile.
<user_consent_needed>	integer	Indicates whether user consent is required or not.

AT#ESIMADDPF=?

Test command reports the supported range of values for parameters **<slot>**,**<user_consent>**.

Not Subject to NDA

3.10.29. AT#ESIMMEMRST - Resets the eUICC card

This command resets the eUICC card present on given slot based on the provided option.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ESIMMEMRST=<slot>,<option_1>,<option_2>,<option_3>

Set command resets the eUICC card present on given slot based on the provided option. If two or more options are set, the action is taken for all those set options.

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Slot information
	Values:		
	1 : Slot 1		
	2 : Slot 2		
<option_1>	integer	N/A	Option 1
	Values:		
	0 : do not action		
	1 : delete all the test profiles		
<option_2>	integer	N/A	Option 2
	Values:		
	0 : do not action		
	1 : delete all operational profiles		
<option_3>	integer	N/A	Option 3

Not Subject to NDA

Values:

0 : do not action

1 : reset the default SM-DP+ address

AT#ESIMMEMRST=?

Test command reports the supported range of values for parameters **<slot>**,**<option_1>**,**<option_2>** and **<option_3>**.

Not Subject to NDA

3.10.30. AT#VSIMSETPROF - Set Virtual SIM profile

This command selects and activates a Virtual SIM profile.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#VSIMSETPROF=<profId>[,<storeNewMode>]

Execution command selects and activates a Virtual SIM profile or deactivates the Virtual SIM profile and instructs the device to use the UICC, using the unconditional activation (i.e. without any possibility to fall back).

Parameters:

Name	Type	Default	Description
<profId>	integer	0	indicates the profile identifier. Values: 0 : the profile 0 represents the UICC 1 : refer to the secured storage table that includes all the subscription data
<storeNewMode>	integer	1	Flag to store **<profId>** selection in file system. Values: 0 : do not store <profId> in file system 1 : store <profId> in file system

SET, READ, TEST commands return always immediate **ERROR** if Virtual SIM application is not present\corrupted or wrong key is present.

Not Subject to NDA

- **#VSIMSETPROF**=1 returns immediate **ERROR** in case SIM profile is missing (i.e. **#SECT**, **#SECP** operations has not been performed yet).
- **#VSIMSETPROF**=0 returns immediate **ERROR** in case physical SIM is missing.
- Expect 3 - 4 seconds delay when SIM switch is performed in warm status (module already running) from physical SIM, 2 seconds from virtual SIM.
- If request is performed immediately after AT parser availability, it can require 3 seconds more. If first response is **ERROR** please retry, it could be due to booting process. To avoid that, send a TEST command before.

AT#VSIMSETPROF?

Read command reports the current value of parameter in the format:

#VSIMSETPROF: <profId>

A special value of 255 indicates that the physical SIM is selected, but a SIM is not inserted

AT#VSIMSETPROF=?

Test command reports the supported range of values for the input parameters.

Not Subject to NDA

3.10.31. AT#VSIMLISTPROF - List existing profiles

This command display ICCID list of existing profiles to manage Virtual SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#VSIMLISTPROF

Execution command causes the module to list ICCIDs that have been retrieved from the Virtual SIM.

Additional info:

- The data are shown in the following format:

  #VSIMLISTPROF: <index>,<active>, <ICCIDx>

Name	Type	Default	Description
<index>	integer	-	Profile index to be used to select the profile. The number of supported profiles depends upon the Virtual SIM.
<active>	integer	N/A	Parameter indicating whether the profile is the currently active (selected) one. Values: 0 : not active 1 : active
<ICCIDx>	string	-	ICCID of the **<index>** profile

Not Subject to NDA

- SET, TEST commands return always immediate **ERROR** if Virtual SIM application is not present, corrupted or wrong key is present.
- Can take 3 - 4 s when performed the first time in warm status (module already running) if physical SIM is active, 2 s if virtual is active.
- If request is performed immediately after AT parser availability, can require 3 s more. If first response is **ERROR** please retry, could be due to booting process. To avoid that, send TEST command before.

AT#VSIMLISTPROF=?

Test command returns **OK** result code.

Not Subject to NDA

3.10.32. AT#SIMDET - SIM Detection Mode

This command manages the SIM detection mode.

[1] Telit Hardware Design Guide of the used module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SIMDET=<mode>

Set command simulates the SIM status or selects the automatic SIM detection status. This command is used by modules providing the dedicated SIMIN pin. Refer to document [1] to have information on dedicated SIMIN pin.

Parameter:

Name	Type	Default	Description
<mode>	integer	2	SIM detection mode

Values:

0 : ignore dedicated SIMIN pin and simulate the status "SIM Not Inserted"

1 : ignore dedicated SIMIN pin and simulate the status "SIM Inserted"

2 : automatic SIM detection using dedicated SIMIN Pin

Not Subject to NDA

When **#SIMDET=1** (that simulates "SIM Inserted") is issued, a query to detect the presence of the SIM is forced, regardless of SIMIN pin status.

If SIM is not responding (for example, because it is not present) then, after a timeout, the modem gives up and sets the SIM status to SIM NOT INSERTED.

If SIM is correctly answering to query, then SIM status becomes SIM READY.

AT#SIMDET?

Read command returns the currently selected SIM Detection Mode in the format:

#SIMDET: <mode>,<simIn>

Additional info:

The values for **<simIn>** are:

Name	Type	Default	Description
<simIn>	integer	0	SIMIN pin status. Values: 0 : SIM not inserted 1 : SIM inserted

AT#SIMDET=?

Test command reports the supported range of values for parameter **<mode>**.

Not Subject to NDA

3.11. SIM Toolkit

3.11.1. AT#STIA - SIM/USIM Toolkit Interface Action

The SIM/USIM Application Toolkit (SAT/USAT) provides an interface to the applications existing in the SIM/USIM device. The module must support the mechanisms required by the SIM/USIM applications.

[1] 3GPP TS 23.038
[2] 3GPP TS 31.111
[3] Telit SIM/USIM Application Toolkit Application Note

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Specific profile	No	-	2

AT#STIA=[<mode>[,<timeout>]]

Set command is used to enable/disable the SIM/USIM Application Toolkit (SAT/USAT). In addition, the command can enable the URCs sending.

Parameters:

Name	Type	Default	Description
<mode>	integer	1	enables/disables SAT/USAT. In addition, <**mode**> parameter enables the: - **#STN** URCs notifying the user that the SIM/USIM application has issued a proactive command. Some proactive commands require a user response. - **#STN** URCs that are the SIM/USIM device responses concerning actions initiated by the user, refer to Additional info section.

Not Subject to NDA

			If <mode>=2, the URC format depends on the <cmdType> as described in the Additional info sections. For <cmdType>, and all other URC parameters refer to #STGI command. The <mode> parameter values are listed below. Values: 0 : disable SAT/USAT 1 : enable SAT/USAT without #STN URC 2 : enable SAT/USAT and extended #STN URC 3 : enable SAT/USAT and reduced #STN URC 17 : enable SAT/USAT without #STN URC and the alphabet used 18 : enable SAT/USAT, extended #STN URC, and the alphabet used 19 : enable SAT/USAT, reduced #STN URC, and the alphabet used 33 : enable SAT/USAT without #STN URC and the UCS2 alphabet used 34 : enable SAT/USAT, extended #STN URC, and the UCS2 alphabet used 35 : enable SAT/USAT, reduced #STN URC, and the UCS2 alphabet used
<timeout>	integer	1	When an ongoing proactive command, requiring a user response, is not answered before <timeout> minutes, it is automatically aborted. In this case, the terminal response from the module is either "ME currently unable to process command" or, if applicable, "No response from user". In addition, the following URC is sent on the AT interface. For parameter

Not Subject to NDA

meaning of the URC refer to Unsolicited fields section.

#STN:<cmdTerminateValue>

Value:

1,2 : timeout expressed in minutes

Additional info:

- <**mode**>=3, the URC has the following reduced format:

  #STN: <cmdType>

- <**mode**>=2, and <**cmdType**>=1 (REFRESH), the URC has the following extended format:

  #STN: 1,<refreshType>

- <**mode**>=2, and <**cmdType**>=5 (SET UP EVENT LIST), the URC has the following extended format:

  #STN: 5[,<eventListMask>]

- <**mode**>=2, and <**cmdType**>=16 (SET UP CALL), the URC has the following extended format:

  #STN: 16,<cmdDetails>,[<confirmationText>],<calledNumber>

- <**mode**>=2, and one of the following proactive command:

  <**cmdType**>=17 (SEND SS)
  <**cmdType**>=18 (SEND USSD)
  <**cmdType**>=19 (SEND SHORT MESSAGE)

Not Subject to NDA

<cmdType>=20 (SEND DTMF)
<cmdType>=32 (PLAY TONE)
<cmdType>=64 (OPEN CHANNEL)
<cmdType>=65 (CLOSE CHANNEL)
<cmdType>=66 (RECEIVE DATA)
<cmdType>=67 (SEND DATA)

the URC has the following extended format:

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

If <cmdType>=19 (SEND SHORT MESSAGE) fails, the **#STN: 119** URC is sent to the module.

- <mode>=2, and <cmdType>=33 (DISPLAY TEXT), the URC is sent if allowed by SIM/USIM, the extended format is:

  #STN: 33[,<cmdDetails>[,<alphaIdentifier>]]

  If bit 7 of <cmdDetails>=1, the response with the **#STSR** command is required.

- <mode>=2, and <cmdType>=34 (GET INKEY), the URC has the following extended format:

  #STN: 34,<cmdDetails>,<text>

- <mode>=2, and <cmdType>=35 (GET INPUT), the URC has the following extended format:

  #STN: 35,<cmdDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

- <mode>=2, and <cmdType>=36 (SELECT ITEM), the URC has the following extended format:

  the first line of output is:

  #STN: 36,<cmdDetails>,<numOfItem>[,<titleText>]<CR><LF>

Not Subject to NDA

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

#STN: 36,<itemId>,<itemText>[,<nextActionId>]

- <**mode**>=2, and <**cmdType**>=37 (SET UP MENU), the URC has the following extended format:

  the first line of output is:

  #STN: 37,<cmdDetails>,<numOfItem>,<titleText><CR><LF>

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

  #STN: 37,<itemId>,<itemText>[,<nextActionId>]

- <**mode**>=2, and <**cmdType**>=40 (SET UP IDLE MODE TEXT), the URC has the following extended format:

  #STN: 40[,<idleModeTextString>]

- This Additional info section deals with the action initiated by the user (no proactive commands activated by the SIM/USIM device).

  If the call control or SMS control facility present in the SIM/USIM device is activated, when the user application makes an outgoing call, or sends a SS or USSD, or a SMS, the following **#STN** URC could be sent to indicate whether the outgoing call has been accepted, rejected or modified by the SIM, or if the SMS service center address or destination has been changed. For parameters meaning refer to Unsolicited fields section.

  #STN: <cmdControlResponse>,<Result>[,<alphaIdentifier>[,<Number>[,<MODestAddr>]]]

Unsolicited fields:

Name	Type	Description

Not Subject to NDA

<cmdTerminateValue>	integer	is defined as <**cmdType**> + terminate offset. Terminate offset = 100
<cmdControlResponse>	integer	response of the SIM/USIM device Values: 150 : SMS control response 160 : call/SS/USSD response
<Result>	integer	identify the result of the Call or SMS control performed by SIM/USIM device Values: 0 : Call/SMS not allowed 1 : Call/SMS allowed 2 : Call/SMS allowed with modification
<alphaIdentifier>	string	optional text provided by the SIM/USIM device in ASCII format
<Number>	string	Called number, Service Center Address or SS String in ASCII format
<MODestAddr>	string	MO destination address in ASCII format

The settings are saved on user profile and available on following reboot. SIM/USIM Toolkit activation/deactivation is only performed at power on according to the saved setting.

If **AT#ENS=1**, the <**mode**> parameter is set to 2.

Just one instance at a time, the one which first issued **AT#STIA=<mode>** (with <**mode**> not equal to 0), is allowed to issue SAT/USAT commands, and this is valid till the same instance issues **AT#STIA=0**. After reboot, SAT/USAT can be used on another instance.

Not Subject to NDA

A typical SAT/USAT 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**).

AT#STIA?

Read command can be used to get information about the SAT/USAT interface. The message format is:

#STIA: <state>,<mode>,<timeout>,<SatProfile>

Additional info:

Returned parameters.

Name	Type	Default	Description
<state>	integer	0	state of the sending of the SET UP MENU proactive command (37) Values: 0 : SIM/USIM has not sent the SET UP MENU proactive command (37) 1 : SIM/USIM has sent the SET UP MENU proactive command (37)
<mode>	integer	-	refer to Set section
<timeout>	integer	-	refer to Set section
<SatProfile>	string	-	SAT/USAT Terminal Profile. Is the list of SIM/USIM Application Toolkit facilities supported by the ME. The profile cannot be changed by the TA.

Not Subject to NDA

In SAT/USAT applications an SMS message is usually 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/USAT, it is recommended to set the SMS text mode with the **AT+CMGF=1** command and enable URC for incoming SMS messages with **+CNMI** command.

AT#STIA=?

Test command returns the range of available values for the parameters <**mode**> and <**timeout**>.

Not Subject to NDA

3.11.2. AT#STGI - SIM Toolkit Get Information

This command interfaces to the SIM/USIM Application Toolkit to get information on the ongoing proactive command.

3GPP TS 31.111
Telit SIM/USIM Application Toolkit Application Note

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#STGI=[<cmdType>]

Set command gets parameters of the ongoing proactive command. The command can be used after the reception of the **#STN: <cmdType>** URC. If no proactive command is ongoing, it returns an **ERROR** message.

Parameter:

Name	Type	Default	Description
<cmdType>	integer	N/A	proactive command code. For each proactive command listed below, the response format is described in the Additional info sections.

Values:

1 : REFRESH

5 : SET UP EVENT LIST

16 : SET UP CALL

17 : SEND SS

18 : SEND USSD

19 : SEND SHORT MESSAGE

Not Subject to NDA

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

Additional info:

▶▶ <cmdType>=1 (REFRESH)

the response format:

#STGI: 1,<refreshType>

Name	Type	Default	Description
<refreshType>	integer	N/A	identifies the refresh type

Values:

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

5 : NAA Application Reset

Not Subject to NDA

6 : NAA Session Reset

7 : Steering of Roaming

8 : Steering of Roaming WLAN

▶▶ <cmdType>=5 (SET UP EVENT LIST)

the response format:

#STGI: 5,<eventListMask>

Name	Type	Default	Description
<eventListMask>	hex	N/A	identifies the list of events to monitor. The <**eventListMask**> (two bytes long) is a bit mask where each bit, when set, indicates that the corresponding event must be monitored (e.g. if <**eventListMask**> is 0x0001, it means that MT call must be monitored). **bit 0** = MT call **bit 1** = Call connected **bit 2** = Call disconnected **bit 3** = Location status **bit 4** = User activity **bit 5** = Idle screen available **bit 6** = Card reader status (if class "a" is supported) **bit 7** = Language selection **bit 8** = Browser Termination (if class "c" is supported)

Not Subject to NDA

bit 9 = Data available (if class "e" is supported)

bit 10 = Channel status (if class "e" is supported)

bits 11 - 15 = reserved for future use

Value:

0x0001÷0x01FF : mask

▶▶ <**cmdType**>=16 (SET UP CALL)

the response format:

#STGI: 16,<cmdDetails>,[<confirmationText>],<calledNumber>

Name	Type	Default	Description
<cmdDetails>	integer	N/A	identifies the command details

Values:

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

Not Subject to NDA

<confirmationText>	string	-	string for user confirmation stage
<calledNumber>	string	-	string containing called numbers

▶▶ This section is dedicated to the following proactive commands:

<cmdType>=17 (SEND SS)
<cmdType>=18 (SEND USSD)
<cmdType>=19 (SEND SHORT MESSAGE)
<cmdType>=20 (SEND DTMF)
<cmdType>=32 (PLAY TONE)

the response format:

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

Name	Type	Default	Description
<alphaIdentifier>	string	-	optional text provided by the SIM/USIM device in ASCII format

▶▶ **<cmdType>**=33 (DISPLAY TEXT)

the response format:

#STGI: 33,<cmdDetails>[,<text>]

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning: **bit 0**: 0 - normal priority 1 - high priority **bits 1-6**: reserved for future use

Not Subject to NDA

			bit 7: 0 - clear message after a delay 1 - wait for user to clear message Value: 0x00÷0xFF : mask
<text>	string	-	text provided by the SIM/USIM device in ASCII format

▶▶ <**cmdType**>=34 (GET INKEY)

the response format:

#STGI: 34,<cmdDetails>,<text>

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning: **bit 0**: 0 - digits only (0-9, *, # and +) 1 - alphabet set **bit 1**: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet **bit 2**: 0 - character sets defined by bit 0 and bit 1 are enabled 1 - character sets defined by bit 0 and bit 1 are disabled and the "Yes/No" response is requested **bits 3-6**: 0

Not Subject to NDA

			bit 7: 0 - no help information available 1 - help information available Value: 0x00÷0x87 : mask
<text>	string	-	string as prompt for test

▶▶ <**cmdType**>=35 (GET INPUT)

the response format:

#STGI: 35,<cmdDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning: **bit 0**: 0 - digits only (0-9, *, #, and +) 1 - alphabet set **bit 1**: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet **bit 2**: 0 - ME may echo user input on the display 1 - user input shall not be revealed in any way. Hidden entry mode is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed. **bit 3**: 0 - user input to be in unpacked

Not Subject to NDA

			format 1 - user input to be in SMS packed format **bits 4-6**: 0 **bit 7**: 0 - no help information available 1 - help information available
	Value: 0x00÷0x8F : mask		
<text>	string	-	string as prompt for text
<responseMin>	integer	N/A	minimum number of characters of the user input
	Value: 0÷255 : minimum length of user input.		
<responseMax>	integer	N/A	maximum number of characters of the user input.
	Value: 0÷255 : maximum length of user input		
<defaultText>	string	-	string supplied as default response text

▶▶ <**cmdType**>=36 (SELECT ITEM)

the response format:

the first line of output is:

#STGI: 36,<cmdDetails>,<numOfItem>[,<titleText>]<CR><LF>

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

#STGI: 36,<itemId>,<itemText>[,<nextActionId>]

Not Subject to NDA

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning: **bit 0**: 0 - presentation type is not specified 1 - presentation type is specified in bit 1 **bit 1**: 0 - presentation as a choice of data values if bit 0 = 1 1 - presentation as a choice of navigation options if bit 0 is 1 **bit 2**: 0 - no selection preference 1 - selection using soft key preferred **bits 3-6**: 0 **bit 7**: 0 - no help information available 1 - help information available Value: 0x00÷0x87 : mask
<numOfItems>	integer	-	number of items in the list
<titleText>	string	-	menu title string
<itemId>	integer	N/A	item identifier Value: 1÷numOfItems : item identifier range

Not Subject to NDA

<itemText>	string	-	item title string
<nextActionId>	integer	-	is the code of next proactive command to be issued upon execution of the menu item. If <**nextActionId**>=0, no next action information available.

▶▶ <**cmdType**>=37 (SET UP MENU)

the response format:

the first line of output is:

#STGI: 37,<cmdDetails>,<numOfItem>,<titleText><CR><LF>

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

#STGI: 37,<itemId>,<itemText>[,<nextActionId>]

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning**:** **bit 0**: 0 - no selection preference 1 - selection using soft key preferred **bit 1-6**: 0 **bit 7**: 0 - no help information available 1 - help information available
	Value:		
	0x00÷0x81	:	mask
<numOfItems>	integer	-	number of items in the list

Not Subject to NDA

<titleText>	string	-	menu title string
<itemId>	integer	N/A	item identifier Value: 1÷numOfItems : item identifier range
<itemText>	string	-	item title
<nextActionId>	integer	-	numerical code of next proactive command type to be issued upon execution of the menu item. If <**nextActionId**>=0, no next action information available.

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

the response format:

#STGI: 40,<idleModeTextString>

Name	Type	Default	Description
<idleModeTextString>	string	-	text provided by the SIM/USIM device in ASCII format

The proactive commands are only those command types that use the AT interface. SAT/USAT 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.

AT#STGI?

Not Subject to NDA

Read command returns the ongoing proactive command and the SAT/USAT state. The message format is:

#STGI: <state>,<cmdType>

Additional info:

- Returned parameters:

Name	Type	Default	Description
<state>	integer	-	state of the sending of the SET UP MENU proactive command (37), refer to **AT#STIA?** command
<cmdType>	integer	-	ongoing proactive command code

AT#STGI=?

Test command returns the supported values of parameters <**state**> and <**cmdType**>.

A typical SAT/USAT session, running on AT interface, starts when the user receives the **#STN: 37** URC. The unsolicited result code must be previously enabled by the **#STIA** command. The **#STN: 37** notifies the user that the main menu of the SIM/USIM Application has been sent to TA, and TA has stored the just received menu. Later, at any time, you can type in the **AT#STGI=37** command to display the main menu of the SIM/USIM Application on TE.

Upon receiving the **#STGI** response, you must enter the **#STSR** command to confirm the execution of the proactive command and provide any required user response. In this case, you must enter the **AT#STSR=37,0,x** command to select the **x** item of the SIM/USIM Application menu.

The **#STN: 237** URC indicates that the main menu of the SIM/USIM Application has been removed from TA, and it is no longer available. In this case, **AT#STGI=37** command returns **ERROR** message.

Not Subject to NDA

3.11.3. AT#STSR - SIM Toolkit Send Response

This command allows the user to provide a response to confirm the execution of the ongoing proactive command.

3GPP TS 31.111
Telit SIM/USIM Toolkit Application Note

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#STSR=[<cmdType>[,<userAction>[,<data>]]]

Set command allows the user to provide a response action to the ongoing proactive command when the action is required by the command itself.

Parameters:

Name	Type	Default	Description
<cmdType>	integer	-	proactive command code, refer to **#STGI** command to have information on the **<cmdType>**
<userAction>	integer	0	identify the user action Values: 0 : the user accepts the ongoing proactive command 16 : proactive SIM/USIM session terminated by user 17 : backward move in the proactive SIM/USIM session requested by the user 18 : no response from user 19 : help information required by the user

Not Subject to NDA

20	:	USSD/SS Transaction terminated by user
32	:	TA currently unable to process command
34	:	user has denied SIM/USIM call setup request
35	:	user cleared down SIM/USIM call before connection or network release

<data>	string	-	data entered by user, see Additional info section

Additional info:

- <**data**> parameter is used according to <**cmdType**>, and when <**userAction**>=0:

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

  <**data**> contains the key pressed by the user. The character set is selected by **+CSCS** command.

  If the ongoing proactive command requires to the user a binary choice (yes/no), the valid content of <**data**> is:

  - "Y" or "y" (positive answer) and "N" or "n" (negative answer) for "IRA", "8859-1", "PCCP437" character sets
  - "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer) for UCS2 alphabet

  The ongoing proactive command to require a binary choice sets bit 2 of the <**cmdDetails**> parameter to 1, see **#STGI** command.

- <**cmdType**>=35 (GET INPUT).

  <**data**> contains the string of characters entered by the user.

Not Subject to NDA

- <cmdType>=36 (SELECT ITEM).
  <data> contains the item identifier selected by the user.

<userAction>=0 is used, for example, to

- accept a call when the ongoing proactive command is SET UP CALL, <cmdType>=16

- start a connection when the ongoing proactive command is OPEN CHANNEL, <cmdType>=64

Use of icons is not supported. All icon related actions will respond with no icon available.

AT#STSR?

Read command returns the ongoing proactive command and the SAT/USAT interface state. The format message is:

#STSR: <state>,<cmdType>

If there is no ongoing proactive command, an **ERROR** message is returned.

Additional info:

- Returned parameters.

Name	Type	Default	Description
<state>	integer	-	state of the sending of the SET UP MENU proactive command (37), refer to **AT#STIA?** command

Not Subject to NDA

<cmdType>	integer	-	proactive command code, refer to **#STGI** command to have information on the <**cmdType**>

AT#STSR=?

Test command returns the range for the parameters <**state**> and <**cmdType**>.

Not Subject to NDA

3.11.4. AT#SDM - Set SIM Toolkit Display Mode

This command is used to set normal/high priority standby display mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SDM=<priority>

Set command sets to normal/high priority standby display mode.

Parameter:

Name	Type	Default	Description
<priority>	integer	0	priority
	Values: 0 : normal 1 : high		

AT#SDM?

Read command returns the current value of the **<priority>** parameter.

AT#SDM=?

Test command returns the range of values for parameter **<priority>**.

Not Subject to NDA

3.11.5. AT#STKENV - Send SIM Toolkit Envelop Command

This command is used to send Envelope command to the UICC when the UE has successfully accepted the list of events of SIM application toolkit.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#STKENV=<cmd_id>

Execution command sends Envelop command to UICC.

Parameter:

Name	Type	Default	Description
<cmd_id>	integer	N/A	command type Values: 1 : menu selection 2 : language selection 3 : user activity 4 : Idle screen available

AT#STKENV=?

Test command returns the **OK** result code.

```
#STN: 05,03
AT#STKENV=3
OK
```


Not Subject to NDA

3.11.6. AT#STIME - Set SIM Toolkit timeout value

This command sets the timeout value for STK timeout test of GCF/PTCRB.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#STIME=[<mode>]

Set command sets a unit of STK timeout value.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	a unit of STK timeout value Values: 0 : in minute 1 : in second

AT#STIME?

Read command returns the current **<mode>**.

AT#STIME=?

Test command returns the supported range of values for parameter **<mode>**.

AT#STIA command is not set to a second unit. When you test "No response from user" and "timeout" of STK test, you must change to a second unit to timeout value of STK.

Not Subject to NDA

Set STK timeout value to a second unit.

```
AT#STIME=1
OK
```

Timeout value is 30 second

```
AT#STIA=2,30
OK
```

Set STK timeout value to a minute unit.

```
AT#STIME=0
OK
```

Timeout value is 1 minute

```
AT#STIA=2,1
OK
```


Not Subject to NDA

3.12. Audio

3.12.1. Audio Basic Configuration

3.12.1.1. AT+CALM - Alert Sound Mode

This command is used to select the general alert sound mode of the device.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT+CALM=<mode>

Select the general alert sound mode of the device.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	general alert sound mode

Values:

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

Not Subject to NDA

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 supported values as compound value.

Not Subject to NDA

3.12.1.2. AT+CRSL - Ringer Sound Level

This command is used to select the incoming call ringer sound level of the device.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT+CRSL=<level>

Set command is used to select the incoming call ringer sound level of the device.

Parameter:

Name	Type	Default	Description
<level>	integer	3	Incoming call ringer sound level. Values: 0 : Level: Off 1 : Level: Low 2 : Level: Middle 3 : Level: High 4 : Level: Progressive

AT+CRSL?

Read command reports the current <**level**> setting of the call ringer in the format:

Not Subject to NDA

+CRSL: <level>

AT+CRSL=?

Test command reports <**level**> supported values as compound value.

+CRSL: (0-4)

Not Subject to NDA

3.12.1.3. AT+CLVL - Loudspeaker Volume Level

This command allows to set the volume of internal loudspeaker audio output.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT+CLVLthe value of max can be read by issuing the Test command

Set command is used to select the volume of the internal loudspeaker audio output of the device.

For LE910Cx ThreadX : <level> factory default=5

AT+CLVL?

Read command reports the current <level> setting of the loudspeaker volume in the format:
+CLVL: <level>

AT+CLVL=?

Test command returns the supported values of parameter <level>

LE910Cx Linux : The setting is saved using the &W command.

LE910Cx ThreadX : The setting is not saved.

Not Subject to NDA

3.12.1.4. AT+CMUT - Microphone Mute Control

This command enables/disables the muting of the microphone audio line during a voice call.

- 3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT+CMUT=<n>

Set command enables/disables the muting of the microphone audio line during a voice call.

Parameter:

Name	Type	Default	Description
<n>	integer	0	Controls the muting of the microphone audio line Values: 0 : mute off, microphone active 1 : mute on, microphone muted

This command mutes/activates both internal and external microphone audio paths.

AT+CMUT?

Not Subject to NDA

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.

Not Subject to NDA

3.12.1.5. AT+CSIL - Silence Command

This command enables the silent mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CSIL=[<n>]

Set command enables/disables the silent mode. When the phone is in silent mode, all signalling tones from MT are suppressed.

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables the silent mode Values: 0 : disable 1 : enable

AT+CSIL?

Read command returns the current value of the parameter <n> in the format:

+CSIL: <n>

AT+CSIL=?

Test command returns the supported values of parameter <n>.

Not Subject to NDA

3.12.1.6. AT#CAP - Change Audio Path

Change physical audio path.

It has no effect and is included only for backward compatibility.

- Telit Modules Software User Guide 2G/3G/4G

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#CAP=[<n>]

Set command defines the mode (hardware or software) to select one physical audio path when the module provides two physical audio paths.

If the module supports only one physical audio path this command is provided for backward compatibility.

Parameter:

Name	Type	Default	Description
<n>	integer	1	audio path

Values:

0 : not supported

1 : handsfree MIC1 - SPKR1 SPKR2 (automatic DSP profile 1 Hands Free)

2 : headset - MIC2 – SPKR1 SPKR2 (automatic DSP profile 2 Headset)

Not Subject to NDA

- The command works only for Analog mode (#DVI = 0)

- The audio path is mutually exclusive, enabling one disables the other.

- When changing the audio path, the volume level is set at the previously stored value for that audio path (see +CLVL).

AT#CAP?

Read command reports the set value of the parameter <n> in the format:

#CAP: <n>

AT#CAP=?

Test command reports the supported values for the parameter <n>.

The setting is saved in NVM using the &W command.

Not Subject to NDA

3.12.1.7. AT#SRP - Select Ringer Path

This command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SRP=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	ringer path number
	Values:		
	0 : it has no effect		
	1 : it has no effect		
	2 : it has no effect		
	3 : it has no effect		

AT#SRP?

Read command reports the set value of the parameter <**n**> in the format:

#SRP: <n>

AT#SRP=?

Test command returns the supported values of parameter <**n**>

Not Subject to NDA

3.12.1.8. AT#SHFSD - Handsfree Sidetone Set

The command purpose is to enable/disable sidetone feature on audio Handsfree path and change the gain level.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SHFSD=[<mode>[,<gain_level>]]

Set command enables/disables the sidetone on Handsfree audio output and change the gain level.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enable/disable handsfree sidetone Values: 0 : disable handsfree sidetone 1 : enable handsfree sidetone
<gain_level>	integer	15	handsfree sidetone gain level Value: 0÷30 : handsfree sidetone gain level (+2dB/step)

These parameters saved in NVM issuing **AT&W** command.

Effected on analog mode only

AT#SHFSD?

Not Subject to NDA

Read command reports whether the handsfree sidetone is currently enabled or not, and current gain level in the format:

#SHFSD: <mode>,<gain_level>

AT#SHFSD=?

Test command returns the supported range of values of parameter **<mode>** and **<gain_level>**.

Not Subject to NDA

3.12.1.9. AT#SHSSD - Set Handset Sidetone

This command enables the sidetone on headset audio output and change the gain level.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SHSSD=[<mode>[,<gain_level>]]

Set command enables/disables the sidetone on Headset audio output and change the gain level.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the handset sidetone Values: 0 : disable 1 : enable
<gain_level>	integer	15	Headset sidetone gain level Value: 0÷30 : Headset sidetone gain level (+2dB/step)

This parameter is saved in NVM issuing AT&W command.

Effected on analog mode only.

AT#SHSSD?

Not Subject to NDA

Read command reports whether the Headset sidetone is currently enabled or not, and current gain level in the format:

#SHSSD: <mode>,<gain_level>

AT#SHSSD=?

Test command returns the supported range of values of parameter <**mode**> and <**gain_level**>.

Not Subject to NDA

3.12.1.10. AT#SPKMUT - Speaker Mute Control

This command enables/disables the global muting of the speaker audio line.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	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:

Name	Type	Default	Description
<n>	integer	0	muting of the speaker audio line Values: 0 : mute OFF, speaker active 1 : mute ON, speaker muted

this command mutes/activates both speaker audio paths, internal speaker and external speaker.

For LE910C1-EUX//SAX/SVX and LE910Cx-WWX product:

- this command enable/disable the muting of the speaker audio line during a voice call.
- this command only enable/disable the voice call, not global mute.

AT#SPKMUT?

Read command reports whether the muting of the speaker audio line during a voice call is enabled or not, in the format:

Not Subject to NDA

#SPKMUT: <n>

AT#SPKMUT=?

Test command reports the supported values for <n> parameter.

The setting is saved in NVM using the &W command.

Not Subject to NDA

3.12.1.11. AT#OAP - Open Audio Loop

This set command enables/disables the Open Audio Path.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#OAP=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the Open Audio Path Values: 0 : disable 1 : enable

The audio loop will be established between microphone and speaker using sidetone scaling value.

AT#OAP command is intended for testing purposes only.

Thus, care must be taken to ensure that during the command execution no other audio interacting commands are issued.

AT#OAP?

Read command reports the current value of the parameter **<mode>** in the format:

#OAP: <mode>

Not Subject to NDA

AT#0AP=?

Test command returns the supported values of parameter <**mode**>.

The audio loop is established between microphone and speaker using sidetone scaling value.
#0AP is intended for testing purposes only. Thus, care must be taken to ensure that during the command execution no other audio interacting commands are issued.

Not Subject to NDA

3.12.1.12. AT#SRS - Select Ringer Sound

Set command sets the ringer tone.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SRS=[<n>,<tout>]

Parameters:

Name	Type	Default	Description
<n>	integer	10	ringing tone

Values:

0 : current ringing tone

1÷max : ringing tone number, where max can be read by issuing the Test command AT#SRS=?

Name	Type	Default	Description
<tout>	integer	0	ringing tone playing time-out in seconds.

Values:

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.

Not Subject to NDA

- When the command is issued with **<n>** > 0 and **<tout>** > 0, the **<n>** ringing tone is played for <tout> seconds and stored as default ringing tone.

- If command is issued with **<n>** > 0 and **<tout>** = 0, the playing of the ringing is stopped (if present) and **<n>** ringing tone is set as current.

- If command is issued with **<n>** = 0 and **<tout>** > 0 then the current ringing tone is played.

- If both **<n>** and **<tout>** are 0 then the default ringing tone is set as current and ringing is stopped.

If all parameters are omitted then the behavior of Set command is the same as Read command

AT#SRS?

Read command reports current selected ringing tone and its status in the following format:

#SRS: <n>,<status>

Additional info:

Parameters returned by the Read command and not described in the previous sections.

Name	Type	Default	Description
<ringing tone number>	integer	N/A	ringing tone number
	Value:		
	1÷max : ringing tone number		
<status>	integer	0	ringing status
	Values:		
	0 : selected but not playing		

Not Subject to NDA

1 : currently playing

AT#SRS=?

Test command reports the supported values for the parameters **<n>** and **<tout>**

Not Subject to NDA

3.12.1.13. AT#SRSEXT - Select Ringer Sound Extended

This command used to set the specific ring sound from file system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SRSEXT=<mode>[,<file_name>]

Set command sets the specific ring sound from file system.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	mode Values: 0 : mode off 1 : mode on
<file_name>	string	-	Current ringing file name. Has a maximum of 32 characters.

- When the command is issued with **<mode>**=1, the ringing tone is stored as default ringing tone (**AT#SRS** is ignored).
- If command is issued with **<mode>**=0, default ring tone will set according to **AT#SRS.**
- **<file_name>** parameter is mandatory if the **<mode>**=1 is issued, but it has to be omitted for **<mode>**=0 is issued.
- **<file_name>** must be exists in APLAY folder (**AT#ALIST**).
- The setting is saved in NVM and available on following reboot.

AT#SRSEXT?

Not Subject to NDA

Read command reports current selected ringing and its status in the form:

#SRSEXT: <mode>,<file_name>

where:
<mode> - ringing tone mode
<file_name> - file name.

AT#SRSEXT=?

Test command reports the supported values for the parameters **<mode>** and **<file_name>**.

Not Subject to NDA

3.12.1.14. AT#HSGS - Headset GPIO Select

This command used to select the headset GPIO for headset detect.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#HSGS=<n>

Set command select the headset GPIO for headset detect.

Parameter:

Name	Type	Default	Description
<n>	integer	-	GPIO number for headset detect, Valid range is "any input/output pin" (see "Hardware User's Guide").

- See on "Hardware User's Guide" Headset detection HW instructions.
- Default value is 0, which means no Headset pin set.
- This command Influence on **#GPIO** and vice versa.
- This parameter is saved in NVM.

AT#HSGS?

Read command returns the current status of headset detection in the format:

When **<n>** not Zero
#HSGS: <n>,<status>

<n> equal to Zero
#HSGS: <n>

where:
<n> - Selected the GPIO number.

Not Subject to NDA

<status> -
1 - Not connected (Logic 'L' voltage level)
2 - Connected (Logic 'H' voltage level)

AT#HSGS=?

Test command returns the supported range of values of parameter **<n>**.

Not Subject to NDA

3.12.1.15. AT#HFRECG - Handsfree Receiver Gain

Handsfree Receiver Gain

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#HFRECG=<level>

Set the handsfree analogue output gain

Parameter:

Name	Type	Default	Description
<level>	integer	0	handsfree analogue output gain
	Value:		
	0÷6 :		handsfree analogue output (-2dB/step)

- This command Influence on +CRSL +CLVL gain dB and another output gain.
- Parameter is saved in NVM issuing AT&W command
- Effected on analog mode only

AT#HFRECG?

Returns the current value of parameter **<level>**, in the format:

#HFRECG: <level>

AT#HFRECG=?

Not Subject to NDA

Returns the supported range of values of parameter <level>.

Not Subject to NDA

3.12.1.16. AT#HSMICG - Handset Microphone Gain

This command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#HSMICG=[<level>]

Set command sets the handset microphone input gain.

Parameter:

Name	Type	Default	Description
<level>	integer	0	handset microphone input gain
	Value:		
	0÷7 :	input gain (+6dB/step)	

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>**.

Not Subject to NDA

The setting is saved using the **&W** command.

The setting is saved using the **&W** command.

Analog and digital audio are supported.

Not Subject to NDA

3.12.1.17. AT#HSRECG - Handset Receiver Gain

This command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#HSRECG=<level>

Set handset analogue output gain

Parameter:

Name	Type	Default	Description
<level>	integer	0	handset analogue output gain
	Value:		
	0÷6 :		analogue output gain (-3dB/step)

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>**.

Not Subject to NDA

The setting is saved using the **&W** command.

Not Subject to NDA

3.12.1.18. AT#HFMICG - Handsfree Microphone Gain

Handsfree Microphone Gain

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#HFMICG=[<level>]

Set the handsfree analogue microphone input gain

Parameter:

Name	Type	Default	Description
<level>	integer	1	handsfree microphone input gain
	Value:		
	0÷7 :		handsfree microphone gain (+7dB/step)

Parameter is saved in NVM issuing AT&W command

AT#HFMICG?

Returns the current handsfree microphone input gain, in the format:

#HFMICG: <level>

AT#HFMICG=?

Returns the supported range of values of parameter **<level>**.

Not Subject to NDA

3.12.2. Tones configuration

3.12.2.1. AT#STM - Signaling Tones Mode

This command enables/disables the signaling tones output on the audio path

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#STM=[<mode>]

Set command enables/disables the signalling tones output on the audio path selected with **#SRP** command (LE910x supported by fix SRP only).

Parameter:

Name	Type	Default	Description
<mode>	integer	1	signaling tones status Values: 0 : signaling tones disabled 1 : signaling tones enabled 2 : all tones disabled

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:

Not Subject to NDA

#STM: <mode>

AT#STM=?

Test command reports supported range of values for parameter <**mode**>

The setting is saved in NVM using the **&W** command.

Not Subject to NDA

3.12.2.2. AT#TONE - Tone Playback

This command allows the playback of either a single DTMF tone or a dial tone for a specified period of time.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#TONE=<tone>[,<duration>]

Execution command allows the playback of either a single DTMF tone or a dial tone for a specified period of time.

Parameters:

Name	Type	Default	Description
<tone>	mixed	N/A	ASCII character describing the tone to be reproduced. Values: 0÷9 : DTMF tones from 0 to 9 # : DTMF tone # * : DTMF tone * A÷D : DTMF tones from A to D Y : free tone
<duration>	integer	30	Duration of current tone in 1/10 of sec. Value: 1÷300 : tenth of seconds

Not Subject to NDA

- #TONE return Error, when play an audio file(#APLAY) and record an audio file(#ARECD) and play ringer sound(#SRS,ringer,ringback tone)

  For LE910C1-EUX/SAX/SVX and LE910Cx-WWX product:

- Not support Y tone

AT#TONE=?

Test command returns the supported range of values for parameters <**tone**> and <**duration**>.

Not Subject to NDA

3.12.2.3. AT#TSVOL - Tone Classes Volume

This command is used to manage the tone classes volume selection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#TSVOL=<class>,<mode>[,<volume>]

Set command is used to select the volume mode for one or more tone classes.

Parameters:

Name	Type	Default	Description
<class>	integer	N/A	sum of integers each representing a class of tones which the command refers to : Values: 1 : GSM tones 2 : ringer tones 4 : alarm tones 8 : signaling tones 16 : DTMF tones 32 : SIM Toolkit tones 64 : user defined tones (TBD) 128 : reserved 255 : all classes
<mode>	integer	0	it indicates which volume is used for the classes of tones represented by **<class>**

Not Subject to NDA

Values:

0 : default volume is used

1 : The volume <volume> is used

<volume>	string	N/A	volume to be applied to the set of classes of tones represented by **<class>**; it is mandatory if **<mode>** is 1.

Value:

1÷max : the value of max can be read issuing the Test command AT#TSVOL=?

- The class DTMF Tones (**<class>**=16) refers only to the volume for locally generated DTMF tones. It does not affect the level of the DTMF generated by the network as result of **AT+VTS** command.

- The class signaling tones(**<class>**=8) effected on VoLTE signaling tones only.

- The all classes does not effect on active voice call only **AT+CLVL** value effected.

- The all classes except ringer tones(**<class>**= 2)/signaling tones(**<class>**=8) are effected on analog mode only.
The ringer tones (**<class>**=2) is effected on analog and digital mode.
The signaling tones(**<class>**=8) is effected on analog and digital mode.

AT#TSVOL?

Read command returns for each class of tones the last setting of **<mode>** and, if **<mode>** is not 0, of **<volume>** too, in the format:

#TSVOL: 1,<mode1>[,<volume1>]<CR><LF>

...

#TSVOL: 64,<mode64>[,<volume64>]

Not Subject to NDA

no info is returned for class 128.

AT#TSVOL=?

Test command returns the supported range of values of parameters **<class>**, **<mode>** and **<volume>**.

- **AT#TSVOL=84,1,5**

  OK

- **AT#TSVOL?**

  #TSVOL: 1,0

  # TSVOL: 2,0

  # TSVOL: 4,1,5

  # TSVOL: 8,0

  # TSVOL: 16,1,5

  # TSVOL: 32,0

  #TSVOL: 64,1,5

  OK

Not Subject to NDA

3.12.2.4. AT#SMSVOL - SMS notification volume

This command allows to set the volume of SMS notification.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SMSVOL=<level>

Set command is used to select the volume of the SMS notification.

Parameter:

Name	Type	Default	Description
<level>	integer	14	SMS notification volume
	Value:		
	0÷14	:	volume step of SMS notification

AT#SMSVOL?

Read command reports the current <**level**> setting of the SMS notification volume in the format:

#SMSVOL: <level>

AT#SMSVOL=?

Test command returns the supported values of parameter <**level**>

- **AT#SMSVOL=11**

  (volume set to 11 level for SMS notification)

Not Subject to NDA

Not Subject to NDA

3.12.2.5. AT#OOBTSET - Out of Band Tone Set

This set command sets an out of band tone.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#OOBTSET=<mode>,<setting>

Set command for out of band tone.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	selects type of OOB tone set Values: 1 : duration of VoLTE DTMF tone 2 : volume of VoLTE DTMF tone
<setting>	integer	N/A	if <mode>=1, means duration of a tone. if <mode>=2, means volume step of tone Values: 0÷255 : duration of every single tone in 10ms; The default is 10 1÷10 : volume step of tone; The default is 1

AT#OOBTSET?

Read command reports the currently setting in the form:

#OOBTSET: <mode>,<setting>

Not Subject to NDA

AT#OOBTSET=?

Test command returns **OK** result code.

- AT#OOBTSET=1,10
  (duration set to 100ms for VoLTE DTMF tones)
- AT#OOBTSET=2,1
  (volume set to 1 level for VoLTE DTMF tones)

Not Subject to NDA

3.12.3. Audio Profiles

3.12.3.1. AT#PRST - Audio Profile Factory Configuration

This command restores the audio profile to default.

It has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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:

- microphone line gain
- earpiece line gain
- side tone gain
- LMS adaptation speed (step size)
- LMS filter length (number of coefficients)
- speaker to micro signal power relation
- noise reduction max attenuation
- noise reduction weighting factor (band 300-500Hz)
- noise reduction weighting factor (band 500-4000Hz)
- AGC Additional attenuation
- AGC minimal attenuation
- AGC maximal attenuation

AT#PRST=?

Test command returns the **OK** result code.

Not Subject to NDA

Current audio profile is reset
AT#PRST
OK

Not Subject to NDA

3.12.3.2. AT#PSAV - Audio Profile Configuration Save

The command stores in NVM the current audio profile. It is not allowed if active audio profile is 0, refer to **#PSEL** command for active profile selection.

It has no effect and is included only for backward compatibility.

This command not saves the actual audio parameters in the NVM of the device.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#PSAV

Execution command saves the following audio parameters:

- microphone line gain
- earpiece line gain
- side tone gain
- LMS adaptation speed
- LMS filter length (number of coefficients)
- speaker to micro signal power relation
- noise reduction max attenuation
- noise reduction weighting factor (band 300-500Hz)
- noise reduction weighting factor (band 500-4000Hz)
- AGC Additional attenuation
- AGC minimal attenuation
- AGC maximal attenuation

AT#PSAV=?

Test command returns the **OK** result code

Not Subject to NDA

```
AT#PSAV
OK
```


Not Subject to NDA

3.12.3.3. AT#PSET - Audio Profile Setting

This command used to set parameters for the active audio profile.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#PSET=<scal_in>[,<scal_out>[,<side_tone_atten>[,<adaption_speed>[,<filter_length>[,<rxtxrelation>[,<nr_atten>[,<nr_w_0>[,<nr_w_1>[,<add_atten>[,<min_atten>[,<max_atten>]]]]]]]]]]]

Set command sets parameters for the active audio profile. It is not allowed if active audio profile is 0.

Parameters:

Name	Type	Default	Description
<scal_in>	integer	-	microphone line digital gain (unused)
<scal_out>	integer	-	earpiece line digital gain (unused)
<side_tone_atten>	integer	-	side tone attenuation
<adaption_speed>	integer	-	LMS adaptation speed (unused)
<filter_length>	integer	-	LMS filter length (number of coefficients) (unused)
<rxtxrelation>	integer	-	speaker to micro signal power relation (unused)
<nr_ atten>	integer	-	noise reduction max attenuation (unused)
<nr_w_0>	integer	-	noise reduction weighting factor (band 300-500Hz) (unused)
<nr_w_1>	integer	-	noise reduction weighting factor (band 500-4000Hz) (unused)

Not Subject to NDA

<add_atten>	integer	-	AGC Additional attenuation (unused)
<min_atten>	integer	-	AGC minimal attenuation (unused)
<max_atten>	integer	-	AGC maximal attenuation (unused)

It has no effect and is included only for backward compatibility.

AT#PSET?

Read command returns the parameters for the active profile in the format:

#PSET:
<scal_in>,<scal_out>,<side_tone_atten>,<adaption_speed>,<filter_length>,<rxtxrelation>,<nr_atten>,<nr_w_0>,<nr_w_1>,<add_atten>,<min_atten>,<max_atten>

It is not allowed if active audio profile is 0.

AT#PSET=?

Test command returns the supported range of values for the audio parameters.

Not Subject to NDA

3.12.3.4. AT#ADSPC - Audio DSP Configuration

This command used to switch the DSP profile audio path.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ADSPC=<n>[,<ecns mode>]

Set command switches the DSP profile audio path depending on parameter **<n>**.

Parameters:

Name	Type	Default	Description
<n>	integer	0	DSP profile configuration Values: 0 : Automatic 1 : Hands Free 2 : Headset 3 : Handset 4 : Speaker phone Bluetooth 5 : TTY 6 : USB
<ecns mode>	integer	0	ECNS mode Values: 0 : Disables ECNS mode 1 : Enables ECNS

Not Subject to NDA

- On Automatic mode:
Digital: handset
Analog: according to #CAP

- This command influence on the #CAP / #SRP.

- On Active/MT/MO Voice Call return Error.

- When #TTY command enabled, SET #ADSPC command return Error.

- The **<n>** = 4 Speaker phone Bluetooth has no effect is included only for backward compatibility.

- The **<n>** = 5 "TTY" only configured DSP profile to "Full TTY" mode, to enable TTY mode and another TTY mode using by #TTY command.

- The **<n>** = 6 is only supported by "Disable ECNS mode".

AT#ADSPC?

Read command reports the active DSP profile configuration in the format:

For TTY profile:

#ADSPC: <n>

For Another DSP profile:

#ADSPC: <n>,<ecns mode>

AT#ADSPC=?

Test command reports the supported values for the parameter **<n>**.

Not Subject to NDA

3.12.3.5. AT#AUSBC - Audio USB Configuration

This command used to set the USB Audio configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#AUSBC=<samplerate>

Set command sets the USB Audio configuration.

Parameter:

Name	Type	Default	Description
<samplerate>	integer	1	Sample rate
	Values: 0 : USB Audio sample rate 8KHz 1 : USB Audio sample rate 16KHz		

#AUSBC is only supported in LE910Cx Linux, Not supported in LE910Cx ThreadX.

Manual reboot is required after changing.

The setting is saved in system.

When the firmware is updated, the setting is set to default, but the setting is maintained in case of FOTA update.

AT#AUSBC?

Report the currently sample rate of USB audio.

Not Subject to NDA

#AUSBC: 1

AT#AUSBC=?

Test command report the range of supported values for parameters **<samplerate>**

Configure USB audio **<samplerate>** to 8KHz

AT#AUSBC=0

OK

Not Subject to NDA

3.12.3.6. AT#PSEL - Audio Profile Selection

This command manages the audio profile selection.

It has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#PSEL=<prof>

Set command selects the active audio profile.

Parameter:

Name	Type	Default	Description
<prof>	integer	0	current profile
	Values:		
	0 :	standard profile	
	1÷3 :	extended profiles, modifiable	

AT#PSEL?

Read command returns the active profile in the format:

#PSEL:<prof>

AT#PSEL=?

Test command returns the supported range of values of parameter <**prof**>.

Not Subject to NDA

The setting is saved using the **&W** command.

Not Subject to NDA

3.12.4. Echo Canceller Configuration

3.12.4.1. AT#SHSEC - Handset Echo Canceller

It has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SHSEC=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	dummy parameter
	Values:		
	0 : dummy value		
	1 : dummy value		

AT#SHSEC?

Read command returns the current value of the parameter **<mode>** in the format:

#SHSEC: <mode>

AT#SHSEC=?

Test command returns the supported values of parameter **<mode>**.

Not Subject to NDA

The setting is saved using the **&W** command.

Not Subject to NDA

3.12.4.2. AT#SHFEC - Handsfree Echo Canceller

This command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SHFEC=[<mode>]

This command has no effect and is included only for backward compatibility.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	mode parameter
	Values: 0 : mode value 1 : mode value		

13. This setting returns to default after power off.
14. Added to **#ADSPC.**

AT#SHFEC?

Read command reports the value of parameter **<mode>**, in the format:

#SHFEC: <mode>

AT#SHFEC=?

Not Subject to NDA

Test command returns the supported range of values of parameter <mode>.

Not Subject to NDA

3.12.4.3. AT#SHSNR - Handset Noise Reduction

This command enables the noise reduction function on audio handset input.

It has no effect and is included only for backward compatibility.

Audio Tunning for Handsfree Systems, 80464NT11417A

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SHSNR=<mode>

Set command enables/disables the noise reduction function on audio handset input.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables noise reduction for handset mode Values: 0 : disable 1 : enable

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

Added to **#ADSPC**

AT#SHSNR?

Not Subject to NDA

Read command returns the current value of the parameter **<mode>**, in the format:

#SHSNR: <mode>

AT#SHSNR=?

Test command returns the supported values of parameter **<mode>**.

The setting is saved using the **&W** command.

Not Subject to NDA

3.12.4.4. AT#SHFNR - Handsfree Noise Reduction

The command purpose is to enable/disable the Noise Reduction feature on audio Handsfree path.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#SHFNR=<mode>

It has no effect and is included only for backward compatibility.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Set command enables/disables the noise reduction function on audio handsfree input. Values: 0 : disables noise reduction for handsfree mode 1 : enables noise reduction for handsfree mode

Note: **<Mode>** parameter is saved in NVM issuing AT&W command.

AT#SHFNR?

Read command reports whether the noise reduction function on audio handsfree input is currently enabled or not, in the format:

#SHSNR: <mode>

Not Subject to NDA

AT#SHFNR=?

Test command returns the supported range of values of parameter **<mode>**.

Not Subject to NDA

3.12.5. Embedded DTMF Decoder & TTY

3.12.5.1. AT#DTMF - Embedded DTMF Decoder Enabling

This command enables/disables the embedded DTMF decoder.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#DTMF=<mode>

Set command enables/disables the embedded DTMF decoder.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the embedded DTMF decoder

Values:

0 : disables DTMF decoder

1 : enables DTMF decoder

2 : enables DTMF decoder without URC notify

Additional info:

<mode>=1

The DTMF tone receiving is notified with an unsolicited message through AT interface in the following format:

#DTMFEV: X,Y

Not Subject to NDA

Unsolicited fields:

Name	Type	Description
<X>	string	DTMF digit
<Y>	string	DTMF Detect type, in-band (0) or out-band (1)

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 **AT&W** command.

LE910C1-EUX/SAX/SVX and LE910Cx-WWX cannot be stored value in NVM using profiles.

AT#DTMF?

Read command returns the currently selected <**mode**> in the format:

#DTMF: <mode>

AT#DTMF=?

Test command returns the supported values of the parameter <**mode**>.

Not Subject to NDA

3.12.5.2. AT#TTY - TeleType Writer

This command enables the TTY functionality.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TTY=<support>

Set command enables/disables the TTY functionality.

Parameter:

Name	Type	Default	Description
<support>	integer	0	enables/disables TTY functionality Values: 0 : disable 1 : enable 2 : enable VCO mode (Voice Carry Over) 3 : enable HCO mode (Hearing Carry Over)

- Enabling this command, blocked #ADSPC set command.
- The value set by command is directly stored in NVM and doesn't depend on the specific AT instance.
- On Active/MT/MO Voice Call return Error.

AT#TTY?

Read command returns whether the TTY functionalities currently enabled or not, in the format:

Not Subject to NDA

#TTY: <support>

AT#TTY=?

Test command reports the supported range of values for parameter <support>.

Not Subject to NDA

3.12.6. Digital Voice Interface

3.12.6.1. AT#DVI - Digital Voiceband Interface

Digital Voiceband Interface handling.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#DVI=<mode>[,<dviport>,<clockmode>]

Set command enables/disables the Digital Voiceband Interface, see documents [1].

Parameters:

Name	Type	Default	Description
<mode>	integer	1	Enables/disables the DVI
	Values:		
	0 : disable DVI; audio is forwarded to the analog line; DVI pins should be Not Connected/or Tri-State		
	1 : Enable DVI: audio is forwarded to the DVI block		
<dviport>	integer	2	Select DVI port
	Value:		
	2 : DVI port 2 will be used		
<clockmode>	integer	1	Select DVI clock mode

Not Subject to NDA

Values:

0 : DVI slave

1 : DVI master

2 : DVI master, clock always on

- **#DVI** parameters are saved in the extended profile.

- **<clockmode>** 2 is not saved in the extended profile.
Only **<clockmode>** 0 or 1 can be saved in the extended profile.

- **#DVI** parameters are not saved in the extended profile by LE910Cx ThreadX product.

- On **<mode>** 0 supported by "DVI master" only.

- When the **<clockmode>** 2, If change the **<clockmode>** 2 to **<clockmode>** 0 or 1 the device will reboot for clock off.

- **#DVICFG** and **#DVICLK** return Error, when **<clockmode>** 2.
If you want to set the DVI clock in **<clockmode>** 2, Please set **<clockmode>** 2 after set the DVI clock in **<clockmode>** 0 or 1

- It impact power consumption if using **<clockmode>** 2.

- The **<dviport>** parameter have no effect and is included only for backward compatibility.

- On Active/MT/MO Voice Call return Error.

- **<clockmode>** 0 and 2 are not supported by LE910Cx ThreadX product.

- On LE910Cx-WWXD product, the **#DVI** command will return an error.

AT#DVI?

Read command reports last setting, in the format:

#DVI: <mode>,<dviport>,<clockmode>.

Not Subject to NDA

AT#DVI=?

Test command reports the range of supported values for parameters <**mode**>,<**dviport**> and <**clockmode**>.

Configure DVI as master on DVI Port #2.

```
AT#DVI=1,2,1
OK
```


Not Subject to NDA

3.12.6.2. AT#DVIEXT - Digital Voiceband Interface Extension

Digital Voiceband Interface Extension.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#DVIEXT=<config>[,<samplerate>[,<samplewidth>[,<audiomode>[,<edge>]]]]

Set command configures the Digital Voiceband Interface.

Parameters:

Name	Type	Default	Description
<config>	integer	0	Transmission mode Values: 0 : PCM Mode 1 : I2S Mode
<samplerate>	integer	0	Sample rate Values: 0 : audio scheduler sample rate 8KHz 1 : audio scheduler sample rate 16KHz 2 : audio scheduler sample rate 48KHz
<samplewidth>	integer	N/A	Number of bit per sample Value: 0 : <samplewidth> has no effect is included only for backward compatibility
<audiomode>	integer	N/A	Mode of audio

Not Subject to NDA

Value:

0 : <audiomode> has no effect is included only for backward compatibility

<edge>	integer	N/A	Edge on which bit is transmitted

Value:

0 : <edge> has no effect is included only for backward compatibility.

- Sample rate has to be only in I2S Mode.
- Manual reboot is required after changing.
- The setting is saved in system.
- Supported samplewidth is 16bit only.
- 48KHz sample rate is not supported in LE910Cx ThreadX.

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>

Not Subject to NDA

3.12.6.3. AT#DVICLK - Digital Voiceband Interface Clock

The command configures the DVI clock signal.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#DVICLK=<clock>[,<samplerate>]

Set command configures and activates the DVICLK clock signal and the Digital Voiceband Interface.

Parameters:

Name	Type	Default	Description
<clock>	integer	0	DVI Clock
	Values:		
	0 : Disable (factory default)		
	128 : DVI Clock activated at 128 KHz		
	256 : DVI Clock activated at 256 KHz		
	512 : DVI Clock activated at 512 KHz		
	1024 : DVI Clock activated at 1024 KHz		
	2048 : DVI Clock activated at 2048 KHz		
	4096 : DVI Clock activated at 4096 KHz		
<samplerate>	integer	0	sample rate
	Values:		
	0 : audio scheduler sample rate 8KHz		
	1 : audio scheduler sample rate 16KHz		

Not Subject to NDA

- On Active/MT/MO Voice Call return Error.
- Clock 4096KHz don't supported with Sample Rate 8KHz
- #DVICFG return Error, when **<clock>** enabled.
- On Clock value zero (0) the clock rate and sample rate taken from #DVICFG <clock> value.
- This parameter is saved in NVM issuing **AT&W** command.
- The command works only for PCM mode (#DVIEXT=0)
- #DVICLK return Error, when I2S mode (#DVIEXT=1)
- #DVICLK return Error, when clock always on mode (#DVI=1,2,2)

For LE910Cx ThreadX product:
- Clock 2048KHz supports only Sample Rate 8KHz.
- Clock 4096KHz supports only Sample Rate 16KHz.
- Both **<clock>** and **<samplerate>** should be entered.
  #DVICLK return Error, if only **<clock>** is enter.
- Factory default is **<clock>** 2048 and **<samplerate>** 0(8KHz).
- Not support #DVICFG.
- Not supports **<clock>** 0, **<clock>** 128, **<clock>** 256, **<clock>** 512, **<clock>** 1024.
- This parameter is not save in NVM.

AT#DVICLK?

Read command reports last setting, in the format:

#DVICLK: <clock>,<samplerate>

AT#DVICLK=?

Test command reports the range of parameter **<clk>** and **<samplerate>**.

Not Subject to NDA

3.12.6.4. AT#DVICFG - Digital Voiceband Interface Configuration

This command used to set the DVI configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT#DVICFG=[<clock>[,<decoder pad>[,<decoder format>[,<encoder pad>[,<encoder format>]]]]]

Set command sets the DVI configuration.

Parameters:

Name	Type	Default	Description
<clock>	integer	0	Clock speed for master mode Values: 0 : normal mode 1 : high speed mode
<decoder pad>	integer	1	PCM padding enable in decoder path Values: 0 : disable 1 : enable
<decoder format>	integer	2	PCM format in decoder path Values: 0 : u-Law 1 : A-Law 2 : linear

Not Subject to NDA

<encoder pad>	integer	1	PCM padding enable in encoder path Values: 0 : disable 1 : enable
<encoder format>	integer	2	PCM format in encoder path Values: 0 : u-Law 1 : A-Law 2 : linear

- #DVICFG parameters are saved in the extended profile.
- #DVICFG return Error, when #DVICLK enabled.
- LE910x only supported by first parameter <**clock**>
- Normal mode (factory default) = 2048KHz with sample rate 8k.
- High speed mode = 4096KHz with sample rate 16k.
- Another parameters (<**decoder pad**>,<**decoder format**>,<**encoder pad**>,<**encoder format**>) have no effect and are included only for backward compatibility.
- The command work only for PCM mode(#DVIEXT=0)
- #DVICFG return Error, when I2S mode(#DVIEXT=1)
- #DVICFG return Error, when clock always on mode(#DVI=1,2,2)

AT#DVICFG=?

Test command returns the supported range of values of parameter <**clock**>,<**decoder pad**>,<**decoder format**>,<**encoder pad**>,<**encoder format**>.

Not Subject to NDA

Not Subject to NDA

3.12.6.5. AT#PCMRXG - DVI Speaker Volume Level

This command used to set the PCM audio RX volume.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#PCMRXG=<RX_VOL>

Set command sets the PCM Audio RX value.

Parameter:

Name	Type	Default	Description
<RX_VOL>	integer	N/A	PCM RX volume in RX path Value: -5000÷1200 : -5000(-50 dB) ~ 1200(+12 dB)

- meaning of a RX_VOL is 1/100 dB step.
- meaning of -50 dB is mute

AT#PCMRXG?

Read command returns the current PCM Audio RX value:

#PCMRXG: <RX_VOL>

AT#PCMRXG=?

Test command returns the supported range of values of parameter **<RX_VOL>**.

Not Subject to NDA

3.12.6.6. AT#PCMDELAY - Set delay before close the PCM Clock/SYNC

This command used to set delay before close the PCM Clock/SYNC.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#PCMDELAY=<delay>

Set command Set delay before close the PCM Clock/SYNC.

Parameter:

Name	Type	Default	Description
<delay>	integer	0	time in seconds to wait before close the PCM Clock/SYNC Value: 0÷10 : from 0 seconds to 10 seconds

- Delay after the voice call only.
- This parameter is saved in NVM issuing **AT&W** command.
- The command work only for PCM mode (**#DVIEXT**=0)
- **#PCMDELAY** return Error, when I2S mode (**#DVIEXT**=1)

AT#PCMDELAY?

Read command returns the current **<delay>** parameters, in the format:

#PCMDELAY: <delay>

AT#PCMDELAY=?

Not Subject to NDA

Test command returns the range of supported values for all the sub parameters.

Not Subject to NDA

3.12.7. Audio File Management

3.12.7.1. AT#ACDB - Store the ACDB(Audio Calibration Database) file

LE910Cx Linux:

This command used to store ACDB(Audio Calibration Database) file on file system or to read current size of specific ACDB file.

LE910Cx ThreadX:

Injection of Audio Configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ACDB=<mode>,<category>[,<size>]

LE910Cx Linux:

Set command to store <**category**> acdb file on FS or to return the current size in Bytes of specific <**category**> file.

LE910Cx ThreadX:

Execution command starts injection of Audio configuration (ACDB) into the device. Once command is issued, the device will print the "connect" reply and will wait for data to be received.
+++ sequence can be used for end of data transmission (which will result in OK response).

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	required action

Values:

Not Subject to NDA

	0 : Store file on FS 1 : Returns the current <size> of the <category> file		
<category>	integer	N/A	ACDB file Values: 0 : Audio_cal.acdb 1 : Bluetooth_cal.acdb 2 : General_cal.acdb 3 : Global_cal.acdb 4 : Handset_cal.acdb 5 : Hdmi_cal.acdb 6 : Headset_cal.acdb 7 : Speaker_cal.acdb
<size>	integer	-	Number of bytes to write to the file

LE910Cx Linux:

In **<mode>** = 0

After command line terminated with **<CR>**, We see the intermediate result code **CONNECT**.

After this prompt, the file type must be in binary format.

If data successfully sent, then the response is OK.

If data sending fails for some reason, an error code reported.

In **<mode>** = 1

Command returns the current <**size**> of the <**category**> file.

#ACDB: <size>

LE910Cx ThreadX:

Not Subject to NDA

Only <**mode**> 0 parameter is supported.

AT#ACDB[=<**mode**>]

Parameters:

<**mode**> - Inject mode

0 - Cold mode Injection. Audio Configuration is injected into FLASH.

In order to be effective a reboot is required.

After command line terminated with <**CR**>, We see the intermediate result code **CONNECT**.

After this prompt, the file type must be in binary format.

If data successfully sent, then the response is OK.

If data sending fails for some reason, an error code reported.

AT#ACDB?

LE910Cx Linux:

Reports the supported range of <**category**> file.

#ACDB: (0-1),(0-7),(File Size)

LE910Cx ThreadX:

Report OK

OK

Not Subject to NDA

- LE910Cx Linux:

  AT#ACDB=0,2,38

  CONNECT

  (send the file with 38 bytes here)

  OK

- LE910Cx Linux:

  AT#ACDB=1,2

  #ACDB: 38

  OK

- LE910Cx ThreadX:

  AT#ACDB=0

  CONNECT

  (send the image file)

  OK

Not Subject to NDA

3.12.7.2. AT#ASEND - Save Audio File

This command allows user to send an audio file to serial port and store it in linux file system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ASEND=<filename>,<filesize>

Execution command allows user to send an audio file to serial port and store it in linux file system.

Parameters:

Name	Type	Default	Description
<filename>	string	-	file name Allowed extensions for **<filename>**: * pcm or no extension - the audio supported format is PCM raw data * wav - the audio supported format is RIFF/WAVE File Format
<filesize>	integer	-	file size in bytes

Not Subject to NDA

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

- In case Storing is completed or an error occurs, URC is received.

- Filename has a maximum of 32 characters

- The total size of all audio files must not be over <total size> in #ASIZE

- The file should be sent using RAW ASCII file transfer. the flow control is set to hardware and baudrate is set to 115200 bps in the UART port settings.

- it's not allowed for TE to use two or more serial ports as DATA service (DUN and asend) simultaneously.

AT#ASEND=?

Test command returns the **OK** result code.

After the CONNECT, an audio file has to be sent to serial port

- AT#ASEND="test.pcm",159182

  CONNECT

Not Subject to NDA

3.12.7.3. AT#ARECD - Record an Audio File

This command records speech data coming from microphone in the modem file system with an audio file format.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	Yes	-	2

AT#ARECD=<mode>[,<fileName>[,<dir>]]

Set command allows enabling/disabling recording speech data coming from microphone in the 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.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	Audio recording operating mode. Values: 0 : stop to record. Optional parameter is not allowed 1 : start to record. Optional parameter is mandatory
<fileName>	string	-	file name; it should be inserted as a string type with .pcm or .wav extension
<dir>	integer	0	audio path selection Values: 0 : record from the microphone 1 : record from the downlink path

Additional info:

Not Subject to NDA

▶▶ When the recording is stopped (<mode> = 0) or if an error occurs, an URC is issued in the following format:

#ARECDEV:<result>

Unsolicited field:

Name	Type	Description
<result>	integer	URC reporting the operation result Values: 0 : file recording done 1 : file recording error

If optional <dir> parameter is omitted, recording will be made from microphone for legacy.

Filename has a maximum of 16 characters excluding double inverted commas.

The overall size of all audio files must not be over <totalSize> in #ASIZE

Below 200 Kb of free space the file system could stop the recording and no more recordings are allowed.

only wav and pcm formats are currently supported

AT#ARECD?

Read command reports the currently selected <mode> in the format:

#ARECD: <mode>

Not Subject to NDA

AT#ARECD=?

Test command reports the supported range of values for the parameter **<mode>** in the format:

#ARECD: (0,1)

- Start recording

  AT#ARECD =1,"rec.pcm"
  OK

  End recording

  AT#ARECD =0
  OK

  #ARECDEV: 0

Not Subject to NDA

3.12.7.4. AT#APLAY - Play an Audio File

This command plays an audio file.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#APLAY<mode>[,<dir>,<filename>[,<volume>]]

This command plays audio file on the speaker or uplink path.

When the playing is ended, the following URC is displayed showing the playing result code.

#APLAYEV: <result>

For <**result**> code values see unsolicited code value section.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	playback mode Values: 0 : stop playback, optional parameters are ignored 1 : start playback, optional parameters <dir> and <filename> are mandatory
<dir>	integer	0	audio path selection Values: 0 : send to the speaker 1 : send to the uplink path
<filename>	string	-	file name, maximum character length is 16. It is mandatory to specify the file

Not Subject to NDA

			extension and write file name between double quotes
<volume>	integer	20	Optional playback volume in dB If the volume optional setting is not present in the **#APLAY** command the default value is always 20.

Value:

0÷69 : playback volume, one dB per step

Unsolicited field:

Name	Type	Description
<result>	integer	playing result Values: 0 : file playing done 1 : file playing error

The format of mono audio file is 8k samples/sec and 16 bits/sample.

.wav and .pcm file formats are supported

AT#APLAY?

Read command reports the currently selected **<mode>,<dir>** in the format:

#APLAY: <mode>,<dir>

Not Subject to NDA

AT#APLAY=?

Test command reports the supported range of values for the parameters **<mode>**, **<dir>**.

Not Subject to NDA

3.12.7.5. AT#ALIST - List Audio Files

The command lists all audio files stored in linux file system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ALIST

Execution command reports the list of the audio files stored in linux file system, in the format:

#ALIST: <filename>,<filesize>,<crc><**CR**><**LF**>

Additional info:

- Intermediate response parameters.

Name	Type	Default	Description
<filename>	string	-	file name
<filesize>	integer	-	file size in bytes
<crc>	hex	-	file CRC16 poly (x^16+x^12+x^5+1) in hex format.

- CRC16 is calculated using the standard CRC16-CCITT x^16+x^12+x^5+1 polynomial (0x1021 representation) with initial value FFFF.
- if one file currently stored in efs is in use, then CRC16 cannot be calculated and execution command does not report **<crc>** for that file.

Not Subject to NDA

CRC calculation time depends on file size. If one filesize is large, Return-time spends a little more time.

AT#ALIST=?

Test command returns the **OK** result code.

Not Subject to NDA

3.12.7.6. AT#ASIZE - Audio Available Size

This command shows residual space in bytes available to store audio files.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ASIZE

Execution command shows residual space in bytes available to store audio files, in the format:

#ASIZE: <totalSize>,<usedSize>,<freeSize>

Additional info:

▶▶ Intermediate response parameters.

Name	Type	Default	Description
<totalSize>	integer	-	size of total NVM file system memory expressed in kB
<usedSize>	integer	-	size of used NVM file system memory expressed in kB
<freeSize>	integer	-	size of available free NVM file system memory expressed in kB

AT#ASIZE=?

Test command returns the **OK** result code.

Not Subject to NDA

3.12.7.7. AT#ADELF - Delete Audio File

This command deletes a specific audio file.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ADELF=<filename>

Set command deletes a specific audio file.

Parameter:

Name	Type	Default	Description
<filename>	string	-	File name to be deleted.

filename has a maximum of 32 characters.

AT#ADELF=?

Test command returns the **OK** result code

Not Subject to NDA

3.12.7.8. AT#ADELA - Delete all Audio Files

This command deletes all audio files stored on the Linux File system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ADELA

Set command deletes all audio files stored on the Linux File system.

AT#ADELA=?

Test command returns the **OK** result code.

Not Subject to NDA

3.12.7.9. AT#ACDBEXT - Extended Control the ACDB(Audio Calibration Database) file

This command used to store ACDB(Audio Calibration Database) file on file system or to read current size of specific ACDB file or select the ACDB file to be loaded into the module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ACDBEXT=<mode>,<slot>[,<category>[,<size>]]

Set command to store <category> acdb file on FS or to return the current size in Bytes of specific <category> file or Select the acdb file to be loaded into the module.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	required action Values: 0 : Store file on FS 1 : Returns the current <size> of the <category> file 2 : Select the acdb files of <slot> to be loaded into the module
<slot>	integer	0	Slot Values: 0 : Slot 0 1 : Slot 1 2 : Slot 2 3 : Slot 3

Not Subject to NDA

<category>	integer	N/A	ACDB file
	Values: 1 : Bluetooth_cal.acdb 2 : General_cal.acdb 3 : Global_cal.acdb 4 : Handset_cal.acdb 5 : Hdmi_cal.acdb 6 : Headset_cal.acdb 7 : Speaker_cal.acdb		
<size>	integer	-	Number of bytes to write to the file

Not Subject to NDA

#ACDBEXT is only supported in LE910Cx Linux, Not supported in LE910Cx ThreadX

In **<mode>** = 0

After command line terminated with **<CR>**, We see the intermediate result code **CONNECT**.

After this prompt, the file type must be in binary format.

If data successfully sent, then the response is OK.

If data sending fails for some reason, an error code reported.

#ACDBEXT cannot store acdb file to <**slot**>=0.
<**slot**>=0 is only for **#ACDB**, **#ACDB** can store acdb file to <**slot**>=0.

In **<mode>** = 1

Command returns the current <**size**> of the <**category**> file.

#ACDBEXT: <size>

In **<mode>** = 2

Command select the acdb file of <**slot**> to be loaded into the module.
Manual reboot is required after changing.
The setting is saved in system.

7 acdb files are 1 set, and it works only when there are 7 files in the <**slot**>.
If there are no 7 acdb files in the <**slot**>, an error is returned.

AT#ACDBEXT?

Reports the currently loaded <**slot**>.

#ACDBEXT: 0

AT#ACDBEXT=?

Reports the supported range of <**slot**> and <**category**> file

Not Subject to NDA

#ACDBEXT: (0-2),(0-3)(0-7),(File Size)

- AT#ACDBEXT=0,1,2,38
  CONNECT
  (send the file with 38 bytes here)
  OK
- AT#ACDBEXT=1,1,2
  #ACDB: 38
  OK
- AT#ACDBEXT=2,1
  OK

Not Subject to NDA

3.13. eCall

3.13.1. AT+CECALL - Initiate eCall

The command is to trigger an eCall to the network.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT+CECALL=<eCallType>

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.

Parameter:

Name	Type	Default	Description
<eCallType>	integer	0	eCall type that must be initiated Values: 0 : test call 1 : reconfiguration call 2 : manually initiated eCall 3 : automatically initiated eCall

Additional info:

- 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 with the format:

  #ECALLEV: <prim>,<data>

Not Subject to NDA

Unsolicited fields:

Name	Type	Description
<prim>	integer	indicates the type of unsolicited sent. Values: 0 : Pull-IND 1 : Data_CNF 2 : AL-Ack 16 : sync loss
<data>	string	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: <eCallType>

AT+CECALL=?

Test command reports the supported range of values for parameter **<eCallType>**.

Not Subject to NDA

3.13.2. AT#ECALL - Embedded IVS Inband Modem Enabling

This command enables embedded IVS modem

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Common profile	No	-	2

AT#ECALL=<mode>

Set command enables/disables the embedded IVS modem.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables IVS modem Values: 0 : disable 1 : enable

Additional info:

- 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>

Unsolicited fields:

Name	Type	Description
<prim>	integer	error code Values:

Not Subject to NDA

	0	:	Pull-IND
	1	:	Data_CNF
	2	:	AL-Ack
	16	:	sync loss
<data> string	Data content of Application Layer message (only with AL-Ack)		

- 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
- When IVS modem is enabled PCM playing, PCM recording and DTMF decoding are automatically disabled (**#SPCM** or **#DTMF** will return error)
- **+CECALL** command supersedes this command because it enables automatically eCall functionality

AT#ECALL?

Read command returns the current value of <**mode**> in the format:

#ECALL: <mode>

AT#ECALL=?

Test command returns the supported values for <**mode**>

Not Subject to NDA

3.13.3. AT#EMRGD - Dial an Emergency Call

This command dials an emergency call.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#EMRGD[=<par>]

Execution command initiates an emergency call without specifying the emergency service.

Set command initiates an emergency call specifying the emergency service.

When the emergency call can initiate, an unsolicited result code reports the selected emergency services in the following format:

#EMRGD: <serv>[,<serv>..[,<serv]]

Parameter:

Name	Type	Default	Description
<par>	integer	0	eCall service (if eCall is supported, Rel8 feature) or sum of integers representing the required emergency services: 15. 1 = Police 16. 2 = Ambulance 17. 4 = Fire Brigade 18. 8 = Marine Guard 19. 16 = Mountain Rescue Values: 0 : unspecified 1÷31 : mask of emergency services 32 : manually initiated eCall 64 : automatically initiated eCall

Not Subject to NDA

Additional info:

- Parameter of the unsolicited result code:

Name	Type	Default	Description
<serv>	string	"Police"	emergency and eCall service
	Values:		
	"Police"	:	police
	"Ambul"	:	ambulance
	"FireBrig"	:	fire brigade
	"MarineGuard"	:	marine guard
	"MountRescue"	:	mountain rescue
	"MIeC"	:	manually initiated eCall
	"AIeC"	:	automatically initiated eCall

AT#EMRGD?

Read command reports the emergency numbers received from the network (if available) and the associated emergency services in the format:

[#EMRGD: <num1>[,<par1>,<serv>[,<serv>..[,<serv]]]
[#EMRGD: <numN>[,<parN>,<serv>[,<serv>..[,<serv]]]]

Additional info:

- Parameter:

Not Subject to NDA

Name	Type	Default	Description
<num>	integer	-	emergency number

AT#EMRGD=?

Test command reports the supported values of parameter <par>.

- Set the emergency call type
  AT#EMRGD=17
  #EMRGD: "Police"," MountRescue "
  OK

  Read the emergency number received by the Network
  AT#EMRGD?
  #EMRGD: 123,2,"Ambul"
  #EMRGD: 910,5,"Police","FireBrig"
  OK

Not Subject to NDA

3.13.4. AT#MSDPUSH - IVS Push Mode Activation

This command allows to enable IVS to issue the request for MSD transmission.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MSDPUSH

Execution command enables IVS to issue the request for MSD transmission.
The downlink signal format is reused to send an initiation message to the PSAP.

AT#MSDPUSH=?

Test command returns **OK** result code.

Not Subject to NDA

3.13.5. AT#MSDSEND - Sending MSD Data to IVS

This command sends MSD data to IVS modem.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	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.

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?

Read command reports the stored MSD data, in the format: <stored MSD data>

AT#MSDSEND=?

Test command returns the **OK** result code.

Not Subject to NDA

3.13.6. AT#MSDREAD - Read eCall MSD

This command returns the last eCall Minimum Set of Data (MSD) set with **#MSDSEND**

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MSDREAD

Execution command returns the last MSD set by **#MSDSEND** in the following format:

#MSDREAD: <data>

AT#MSDREAD?

Read command has the same effect of execution command.

AT#MSDREAD=?

Test command returns **OK**

Not Subject to NDA

- AT#MSDSEND

  >011C0601D55D70D65C3597CA18510308141544048378814 99D49B75888C0C832
  0C8320CFF0000000000000000000000000000000000000000000000000000000
  0000000000000000000000000000000000000000000000000000000000000000
  0000000000000000000000000000000000000000000000000000000000000000
  000000000000

  OK

  AT#MSDREAD

  #MSDREAD:
  011C0601D55D70D65C3597CA18510308141544048378814 99D49B75888C0C8320
  C8320CFF0000000000000000000000000000000000000000000000000000000
  0000000000000000000000000000000000000000000000000000000000000000
  0000000000000000000000000000000000000000000000000000000000000000
  00000000000

  OK

Not Subject to NDA

3.13.7. AT#ECALLNWTMR - Configure Network Deregister Timer

This command sets timers related to network deregistration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ECALLNWTMR=[<T3242_DEREGISTER_TIMER>,<T3243_DEREGISTER_TIMER>]

Set command sets timers which are related network deregistration.

Parameters:

Name	Type	Default	Description
<T3242_DEREGISTER_TIMER>	integer	720	Timer value in units of minutes Value: 1÷2184 : Set the time after which the GSM and UMTS communication module terminates network registration. This timer operates after the emergency call
<T3243_DEREGISTER_TIMER>	integer	720	Timer value in units of minutes Value: 1÷2184 : Set the time after which the GSM and UMTS communication module

Not Subject to NDA

	terminates network registration. This timer operates after the test or reconfiguration call.

The setting is available after a reboot

This command works in eCall only sim or AT#ECONLY=2

AT#ECALLNWTMR?

Read command returns the current parameter value.

AT#ECALLNWTMR=?

Test command returns the range of supported parameters.

Not Subject to NDA

3.13.8. AT#ECALLTMR - Reconfigure eCall Timer

The command configures the eCall timers.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ECALLTMR=[<alAckPeriod>,<signalDuration>,<sendMsdPeriod>,<msdMaxTransmitTime>,<CCFT>]

Set command allows to configure the eCall related timers.

Parameters:

Name	Type	Default	Description
<alAckPeriod>	integer	5000	set the AL ACK period Value: 1000÷65535 : timer value in units of milliseconds
<signalDuration>	integer	2000	set the IVS initiation signal duration Value: 1000÷65535 : timer value in units of milliseconds
<sendMsdPeriod>	integer	5000	set the MSD duration Value: 1000÷65535 : timer value in units of milliseconds
<msdMaxTransmitTime>	integer	20	set the maximum MSD transmission duration Value:

Not Subject to NDA

	10÷65535 : timer value in units of seconds		
<CCFT>	integer Value: 0÷65535 : timer value in units of minutes	60	set the automatic call termination counter T2

The setting is saved in NVM and it is available without reboot.

AT#ECALLTMR?

Read command reports the current parameters values.

AT#ECALLTMR=?

Test command returns the supported values of parameters <alAckPeriod>, <signalDuration>, <sendMsdPeriod>, <msdMaxTransmitTime> and <CCFT>.

Modules supporting the command
LE910C1-NA
LE910C1-AP
LE910Cx-NF
LE910Cx-EU
LE910C1-NAD
LE910Cx-NFD

Not Subject to NDA

3.13.9. AT#ECONLY - Set eCall Only Mode

This command enables the eCall Only mode of operation.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ECONLY=<mode>

Set command enables/disables the eCall Only mode of operation

Parameter:

Name	Type	Default	Description
<mode>	integer	0	eCall Only mode of operation

Values:

0 : disable eCall Only mode, normal mode

1 : enable eCall Only mode if eCall only subscription is available

2 : enable eCall Only mode even if eCall only subscription is not available

The value set by command is directly stored in NVM.

The **<mode>** of "1 - enable eCall Only mode if eCall only subscription is available" is available at the next switch-on.

AT#ECONLY?

Read command reports the currently selected <**mode**> and <**status**> in the format:

#ECONLY: <mode>,<status>

Not Subject to NDA

Additional info:

▶▶ Parameters:

Name	Type	Default	Description
<status>	integer	N/A	status of eCall Only functionality Values: 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 returns the supported values of parameter <**mode**>.

Not Subject to NDA

3.13.10. AT#ECALLURC - Enable/Disable eCall URC

The command manages the eCall Unsolicited Result Codes allowing the user to know the eCall events in real-time.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ECALLURC=<mode>

The command selects eCall URC with the following format:

#ECALLEV: <stat>[,<data>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Sets the URC mode with the related unsolicited result code configuration. Values: 0 : eCall URC Version 1, stat = {0,1,2} 1 : eCall URC Version 2, stat = {0,1,2,11,12} 2 : eCall URC Version 3, stat = {0,1,2,5,6,7,11,12}

Unsolicited fields:

Name	Type	Description
<stat>	integer	It reports the last eCall event occurred. Values: 0 : eCall START message detected 1 : eCall LL-ACK message detected

Not Subject to NDA

		2 : eCall HL-ACK message detected 5 : T5 expiring, IVS automatically unmutes downlink and uplink 6 : T6 expiring, IVS automatically unmutes downlink and uplink 7 : T7 expiring, IVS automatically unmutes downlink and uplink 11 : IVS disconnects microphone and speaker from speech codec and connects In-band Modem to speech codec 12 : IVS disconnects In-band Modem from speech codec and connects microphone and speaker to speech codec
<data>	integer	It reports the application layer message. Values: 0 : Positive ACK 1 : Clear-down

AT#ECALLURC?

Read command reports the currently selected eCall URC mode in the format:

#ECALLURC: <mode>

AT#ECALLURC=?

Test command reports the supported range of values for parameter **<mode>**.

Not Subject to NDA

3.14. Power Down

3.14.1. AT#REBOOT - Module Reboot

Immediate module reboot.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	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.

If **#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 **#REBOOT**, to permit the complete NVM storing.

#REBOOT is an obsolete AT command; please refer to **#ENHRST** to perform a module reboot.

URC messages occurred during the shutdown procedure of **#REBOOT** may not be shown.

AT#REBOOT=?

Test command returns **OK** result code.

- Reboot the module
  AT#REBOOT
  OK
  (the module reboots)

Not Subject to NDA

3.14.2. AT#ENHRST - Periodic Reset

Enable or Disable the one shot or periodic unit reset

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENHRST=<mode>[,<delay>]

Set commands enables/disables the unit reset after the specified <**delay**> in minutes

Parameters:

Name	Type	Default	Description
<mode>	integer	0	Enable\Disable mode Values: 0 : disables the unit reset 1 : enables the unit reset only one time (one shot reset) 2 : enables periodically unit reset
<delay>	integer	-	time interval in minutes after that the unit reboots; numeric value in minutes

The settings are saved automatically in NVM only if old or new <**mode**> value is 2, i.e. unit set in periodic reset mode. Therefore, any change from 0 to 1 or conversely is not stored in NVM.

The command **AT#ENHRST=1,0** causes the immediate module reboot. If it follows an AT command that stores some parameters in NVM, it is strongly recommended to insert a delay of at least 5 sec before issuing it, to permit the complete NVM storing process.

Not Subject to NDA

When the command is set with **<mode>**=2, it could take more time than the **<delay>** value due to booting time.

AT#ENHRST?

Read command reports the current parameter settings in the following format:

#EHNRST: <mode>[,<delay>,<remainTime>]

Additional info:

Read command parameter for <**mode**> =1 or 2.

Name	Type	Default	Description
<remainTime>	integer	-	time remaining before next reset

AT#ENHRST=?

Test command reports supported range of values for parameters <**mode**> and <**delay**>.

Not Subject to NDA

Example of **#ENHRST** usage and expected unit behavior.

- AT#ENHRST=1,60

  ...

  Module reboots after 60 minutes

- AT#ENHRST=1,0

  Module reboots immediately

- AT#ENHRST=2,60

  ...

  Module reboots after 60 minutes and indefinitely after every following power on

Not Subject to NDA

3.14.3. AT#SHDN - Software Shutdown

This command turns the module OFF.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SHDN

Execution command causes device to detach from the network and shut down. Before definitive shut down an **OK** response is returned.

When issuing the command any previous activity terminated and the device will not respond to any further command.

To turn it on again hardware pin ON/OFF must be tied low.

The maximum time to shut down the device, completely is 25 seconds.

AT#SHDN=?

Test command returns **OK** result code.

Not Subject to NDA

3.14.4. AT#SYSHALT - System Turn-Off

The command sets the module in SYSHALT state.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SYSHALT

The execution command sets the module in SYSHALT state. To power down the module, the serial port (ASC0) must have the control signals CTS, DTR, DCD and RING low.

AT#SYSHALT?

Read command returns the current stored parameters in the following format:

#SYSHALT: <GPIORestore>,<DTRWakeUpEn>,<RebootEn>

Additional info:

▶▶ Here are the parameters meanings.

Name	Type	Default	Description
<GPIORestore>	integer	0	select the GPIOs and serial ports pins setting

Values:

0 : GPIOs and serial ports pins are left unchanged

Not Subject to NDA

		1 : GPIO and serial pins are set in input with pull down	
<DTRWakeUpEn>	integer	0	select the DTR behavior
	Values: 0 : DTR has no effect on module turned OFF by #SYSHALT 1 : DTR transition from low to high turns on again the module turned off by #SYSHALT command		
<RebootEn>	integer	1	select how the module exits SYSHALT
	Values: 0 : module exits from SYSHALT and stays in detached mode like CFUN=4 status. To restore normal behavior, the user shall set CFUN=1 1 : module exits from SYSHALT performing a total reboot		

The parameters are not settable.

AT#SYSHALT=?

Test command reports the range for the parameters **<GPIORestore>**, **<DTRWakeUpEn>** and **<RebootEn>**.

Not Subject to NDA

#SYSHALT command is available when #M2MATP is '1'.

Not Subject to NDA

3.14.5. AT#FASTSHDN - Fast Shutdown Configuration

This command can be used as a set command to configure a GPIO pin performing a fast shutdown when on it is forced a High to Low level transition. Or can be used as an execute command to force immediately a fast shutdown.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#FASTSHDN[=<enable>[,<pin>]]

Set command configure fast power down.

Parameters:

Name	Type	Default	Description
<enable>	integer	0	enable/disable the fast shutdown execution via a GPIO pin. Values: 0 : disabled 1 : enabled
<pin>	integer	-	GPIO number used for fast power down event monitoring. Valid range is "any input pin" (see "Hardware User's Guide"). This parameter used when **<enable>** is 1.

Additional info:

- Module enter power off autonomously if fast power down is enabled and event monitoring GPIO goes to low after modem boot done.

Not Subject to NDA

The execution command **#FASTSHDN**<CR><LF> forces the module to execute immediately fast power down regardless to the GPIO status or enabled status.

All configured values stored on module and applied after next power cycle.

However, LE910C1-EUX/SAX/SVX and LE910Cx-WWX can be applied immediately.

The stored configuration is maintained when after firmware switching.

It has highest priority than other functions when fast power down enabled and GPIO is used as fast power down event monitoring. Customer should not use GPIO for other function.

Execution command response can be omitted to reduce time taking on power down.

Should do not use GPIO8 as fast power down pin on mPCIe type.

AT#FASTSHDN?

Read command returns the saved value in the format:

#FASTSHDN: <enable>,<pin>

AT#FASTSHDN=?

Test command reports the range for the parameters **<enable>** and **<pin>**.

Not Subject to NDA

3.15. HW and Radio Control

3.15.1. AT#ETHMAC - Configure MAC Address for Ethernet Interface

Configure hardware MAC address for ethernet interface

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	Yes	-	2

AT#ETHMAC=<macaddr>

Set command configures MAC address for ethernet interface.

Parameter:

Name	Type	Default	Description
<macaddr>	string	-	MAC address, the parameter should include double quotes("") e.g. "xx:xx:xx:xx:xx:xx"

Written MAC address is maintained after firmware updating.

This command is supported for LE910C1-EU/NF/LA (4G+2G).

AT#ETHMAC?

Read MAC address stored for ethernet interface.

AT#ETHMAC=?

Test command returns OK.

Not Subject to NDA

Example of this command.

- AT#ETHMAC="00:21:7E:00:00:00"
  OK

Not Subject to NDA

3.15.2. AT#ETHCFG - Ethernet LAN configuration

This command configures ethernet LAN parameters for gateway, subnet mask, DHCP and DNS.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#ETHCFG=<GWIPAdddress>,<SubNetMask>,<Start_IPaddress>,<End_IPaddress>[,<DNS1>[,<DNS2>]]

Set command configures ethernet LAN parameters for gateway, subnet mask, DHCP and DNS.

Parameters:

Name	Type	Default	Description
<GWIPAdddress>	string	-	Gateway IP address.
<SubNetMask>	string	-	Subnet mask for gateway.
<Start_IPaddress>	string	-	Starting of IP range to be assigned by DHCP server to clients.
<End_IPaddress>	string	-	Last of IP range to be assigned by DHCP server to clients.
<DNS1>	string	-	Preferred DNS server IP address
<DNS2>	string	-	Alternate DNS server IP address

This command is used for DHCP and DNS configuration.

This command is available when ethernet is in LAN mode and ethernet is enabled.

If LAN parameters are changed by this command, the other interfaces (RNDIS, ECM or WLAN) will be affected.

Not Subject to NDA

- If DNS settings are set, the DNS settings are kept after reboot.
- If DNS settings are set to 0.0.0.0, the DNS settings are deleted.
- If the setting is not maintained after firmware update.

AT#ETHCFG?

Read command returns the values in the following format

#ETHCFG: <GWIPAdress>,<SubNetMask>,<Start_IPaddress>,<End_IPaddress>,<DNS1>,<DNS2>

OK

AT#ETHCFG=?

Test command returns the range of supported values for all the parameters.

AT#ETHCFG=192.168.10.1,255.255.255.0,192.168.10.2,192.168.10.20,8.8.8.8

Not Subject to NDA

3.15.3. AT#ETHIP - Return assigned IP address

This command returns the assigned IP address

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ETHIP

Execute returns the assigned IP address from host (DHCP server).

If ethernet interface is disabled or is in LAN mode, this command return "0.0.0.0".

AT#ETHIP=?

Test command returns the range of supported values for all the parameters

Not Subject to NDA

3.15.4. AT#ETHMODE - Change Ethernet Mode

Set command changes the ETH mode

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	Yes	-	2

AT#ETHMODE=<mode>

Set command changes the ETH mode

Parameter:

Name	Type	Default	Description
<mode>	integer	0	ETH mode
	Values:		
	0 : LAN mode		
	1 : WAN mode		

If **#ETHEN** is set to 1 or 2, the command return ERROR.

If #WLANMODE is set to 1 or 2, this command should not be set as WAN mode.

AT#ETHMODE?

Read command returns the current mode status

AT#ETHMODE=?

Test command returns the range of supported values for all the parameters

Not Subject to NDA

Not Subject to NDA

3.15.5. AT#ETHSTATUS - Link status of Ethernet

This command is used to enable/disable the presentation of ethernet link status URC.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	Yes	-	2

AT#ETHSTATUS=[<urcmode>]

Parameter:

Name	Type	Default	Description
<urcmode>	integer	0	URC mode

Values:

0 : It disables the presentation of ethernet link status URC

1 : It enables the presentation of ethernet link status URC;

Additional info:

- If the **<urcmode>** is enabled, the user is nofied by the following URC:
  #ETHSTATUS: <status>

- If ethernet cable is connected and ethernet link status is established, the value of **<status>** is 1
- If ethernet cable is disconnected, the value of **<status>** is 0
- This command is possible to detect ethernet link status when ethernet interface is enabled by **#ETHEN** command.

Not Subject to NDA

AT#ETHSTATUS?

Read command returns the current parameter setting and ethernet link status in the format:

#ETHSTATUS: <urcmode>,<status>

AT#ETHSTATUS=?

Test command returns the range of supported values for all the parameters

Not Subject to NDA

3.15.6. AT#ETHEN - Enable/Disable ETH

This command is used to enable/disable Ethernet MAC and PHY

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ETHEN=<mode>[,<cid>]

Set command enable/disable ETH.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	status mode Values: 0 : Disable ETH 1 : Enable ETH 2 : Auto enable
<cid>	integer	-	(PDP Context Identifier) numeric parameter which specifies a particular PDP context definition (see **+CGDCONT** command)

In case of enabling ETH with no network (No SIM card, **+CFUN**=4, ...), this command will return ERROR.

If target PDP is not connected to WWAN by this command, this command will return ERROR.

If a PDP context is already established, return OK.

Not Subject to NDA

- In case of enabling ETH without external PHY, this command return ERROR.
- SIM slot 2 should be disabled before executing this command because ethernet interface is shared with USIM2 port; please refer to **#SIMSELECT** and **#ENSIM2** command.
- If **<mode>** is set to 2, ETH will auto enable upon re-connection based on **#ETHMODE** setting i.e. backhaul connection is established or DHCP client executed.
- If **#ETHMODE** is set to 1 and **<mode>** is set to 1, DHCP client is executed.
- If **#ETHMODE** is set to 0 and **<mode>** is set to 1, backhaul connection is established.

AT#ETHEN?

Read command returns the ETH state and session state.

Additional info:

#ETHEN: <mode>,<state>

OK

Where:

<mode>

0 - ETH disabled state

1 - ETH enabled state

2 - ETH enable and start backhaul connection or DHCP client

<state> - data connection status

0 - disabled

1 - enabled

Not Subject to NDA

AT#ETHEN=?

Test command returns the range of supported values for all parameters

Not Subject to NDA

3.15.7. AT#USBZLPDIS - Configure Modem Ports for a host not sending ZLP

This command makes USB Modem ports and SAP port available with a host not sending ZLP packet.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#USBZLPDIS=<mode>

Set command configures Modem ports and SAP port for a host not sending ZLP

Parameter:

Name	Type	Default	Description
<mode>	integer	0	USB ZLP configuration

Values:

0 : Disable; This mode is used that Host should send ZLP after transferring a packet with maximum size(wMaxPacketSize).

1 : Enable; This mode is used when the host does not send ZLP after transferring a packet with maximum size(wMaxPacketSize).

- This command could make downgrade on throughput.
- This command effects to two Modem ports and one SAP port.
- Manual reboot is required after changing.
- The setting is maintained even after firmware updates.

Not Subject to NDA

AT#USBZLPDIS?

Read command show current **<mode>** in the following format

#USBZLPDIS: <mode>

AT#USBZLPDIS=?

Test command returns the range of supported values

Not Subject to NDA

3.15.8. AT+CBC - Battery Charge

This command allows to read the current Battery Charge status.

- 3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT+CBC

Execution command returns the current Battery Charge status.

Additional info:

Battery Charge status is shown in the format:
+CBC: <bcs>,<bcl>

Name	Type	Default	Description
<bcs>	integer	N/A	battery status
	Values:		
	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>	integer	N/A	battery charge level, only if **<bcs>**=0
	Values:		

Not Subject to NDA

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

<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.

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.

<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.

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.

Not Subject to NDA

```
AT+CBC
+CBC: 0,75
OK
```


Not Subject to NDA

3.15.9. AT#TEMPCFG - Temperature Monitor Configuration

Set command sets the temperature zones shown in Note section. Use **#TEMPMON** command to get the current internal temperature of the module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TEMPCFG=<etlz_clr>,<etlz>,<etlz_act_in>,<otlz_clr>,<otlz>,<otlz_act_in>,<otnz_clr>,<otnz>,<otnz_act_in>,<otuz_clr>,<otuz>,<otuz_act_in>,<etuz_clr>,<etuz>,<etuz_act_in>

Set command sets the Temperature zones used in the **#TEMPMON** command.

Parameters:

Name	Type	Default	Description
<etlz_clr>	integer	-273	extreme low zone temperature threshold clear. Value: -273 : degree C (See note.)
<etlz>	integer	-33	extreme low zone temperature threshold. Value: -40÷105 : degree C
<etlz_act_in>	integer	0	extreme low zone action info. Value: 0÷5 : action
<otlz_clr>	integer	-35	operate low zone temperature threshold clear.

Not Subject to NDA

	Value: -40÷105 : degree C		
<otlz>	integer	-28	operate low zone temperature threshold. Value: -40÷105 : degree C
<otlz_act_in>	integer	0	operate low zone action info. Value: 0÷5 : action
<otnz_clr>	integer	-30	operate normal zone temperature threshold clear. Value: -40÷105 : degree C
<otnz>	integer	94	operate normal zone temperature threshold. Value: -40÷105 : degree C
<otnz_act_in>	integer	0	operate normal zone action info. Value: 0÷5 : action
<otuz_clr>	integer	80	operate up zone temperature threshold clear. Value: -40÷105 : degree C

Not Subject to NDA

<otuz>	integer	99	operate up zone temperature threshold. Value: -40÷105 : degree C
<otuz_act_in>	integer	2	operate up zone action info. Value: 0÷5 : action
<etuz_clr>	integer	82	extreme up zone temperature threshold clear. Value: -40÷105 : degree C
<etuz>	integer	105	extreme up zone temperature threshold. Value: 105 : degree C (See note.)
<etuz_act_in>	integer	3	extreme up zone action info. Value: 0÷5 : action

etlz_clr - Extreme low zone threshold clear is enforced to have value of '-273'. Module doesn't operate in such temperature, but this value is logically set in order to define clearly 'thermal state' to temperatures below -40 deg.

etuz - Extreme up zone threshold is enforced to have value of '105'. Module doesn't operate in such temperature, but this value is logically set in order to define clearly 'thermal state' to temperatures above 105 deg.

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- The module is shutdown(action-5) at temperature above the Extreme up zone threshold (105 deg).
- "**#TEMPMON**" set command, changes field "actions" to "**mitigate**" or "**none**" to all zones.
- The temperature correctly set are saved in a configuration file in the module file system.

AT#TEMPCFG?

Read command reports the current parameter setting for **#TEMPCFG** command in the format:

#TEMPCFG: <etlz_clr>,<etlz>,<etlz_act_in>,<otlz_clr>,<otlz>,<otlz_act_in>,<otnz_clr>,
<otnz>,<otnz_act_in>,<otuz_clr>,<otuz>,<otuz_act_in>,<etuz_clr>,<etuz>,<etuz_act_in>

AT#TEMPCFG=?

Test command reports the supported range values for parameters <**x_clr**>,<**x**>, <**x_act_in**>, where "**x**" is substitute for **etlz**, **otlz**, **otnz**, **otuz**, **etuz**.

Values are:

#TEMPCFG: (-40-105),(-40-105),(0-5)

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Thermal mitigation mechanism

After setting new values, the mitigation algorithm operates with them if a power cycle or **#REBOOT** command is executed.
Thermal mitigation mechanism works like this:

- the whole temperature scale is divided into 5 states (zones).
- each measured temperature should belong to a state called the **current state**.

Each state is defined by the following fields:

threshold	upper temperature boundary of the state. Values are in Celsius degrees.
threshold_clr	lower temperature boundary of the state. Values are in Celsius degrees.
action_info	indicator that indicates if an action should be taken or not in the **current state**.

action_info can be: **none** or **mitigate**, their values are shown in the table below.

none	mitigate	mitigation action
0		no mitigation
	1	data throttling (reducing uplink baud rate)
	2	TX back off (reducing MTPL - Max Tx Power Limit)
	3	emergency calls only
	4	RF OFF. RX and TX circuits automatically disabled (using **+CFUN=4**)
	5	automatic shutdown. Module is powered OFF

There are five limitations on setting temperature and actions, in-order to keep module safety.

- User is prohibited to set an action of "automatic shutdown" to 'operate normal zone'.
- User is prohibited to set an action of "no mitigation" or "data throttling "to "operate up zone".

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- User is prohibited to set an action of "no mitigation" or "data throttling" or "tx backoff" to "extreme up zone".

- User is prohibited to set "normal zone" above 97deg.

- If the module enters into a state of "emergency only" calls, registration again to a regular call, happens just when the module returns to "no mitigation" state **only**.

- A "**+CME ERROR: operation not supported**" error will be received as a response.

When temperature exceeds the **current state threshold**, the thermal mitigation algorithm searches the next state when this temperature is **lower** than **threshold**. After it finds it, the **current state** is updated to that **state** and then it checks whether **action** is **mitigate**. If yes, then it activates the mitigation according to the **action_in** of the **current state**.

When temperature decreases below **threshold_clr** then it does the same algorithm as above, but in the opposite direction. It searches the next state when this temperature is greater than **threshold_clr**, updates the **current state** to that state, and activates mitigation as described above.

In the state definitions there are the following two rules:

- rule 1: overlap between 2 adjacent states of at least 2 deg (Celsius), i.e.:
  thr of state(x) - thr_clr of state(x+1) greater or equal than 2

- rule 2: every state shall have free temperature range which has no part in any overlap range.
  This range should be at least 2 deg (Celsius), i.e.:
  thre_clr state(x+2) - thre state(x) greater or equal than 2

Rule 1 comes to ensure hysteresis in the transition between two states.

Rule 2 comes to ensure a minimum range for a stable state.

Referring to the figure below:

State 0 is **Extreme low zone**

State 1 is **Operate low zone**

State 2 is **Operate normal zone**

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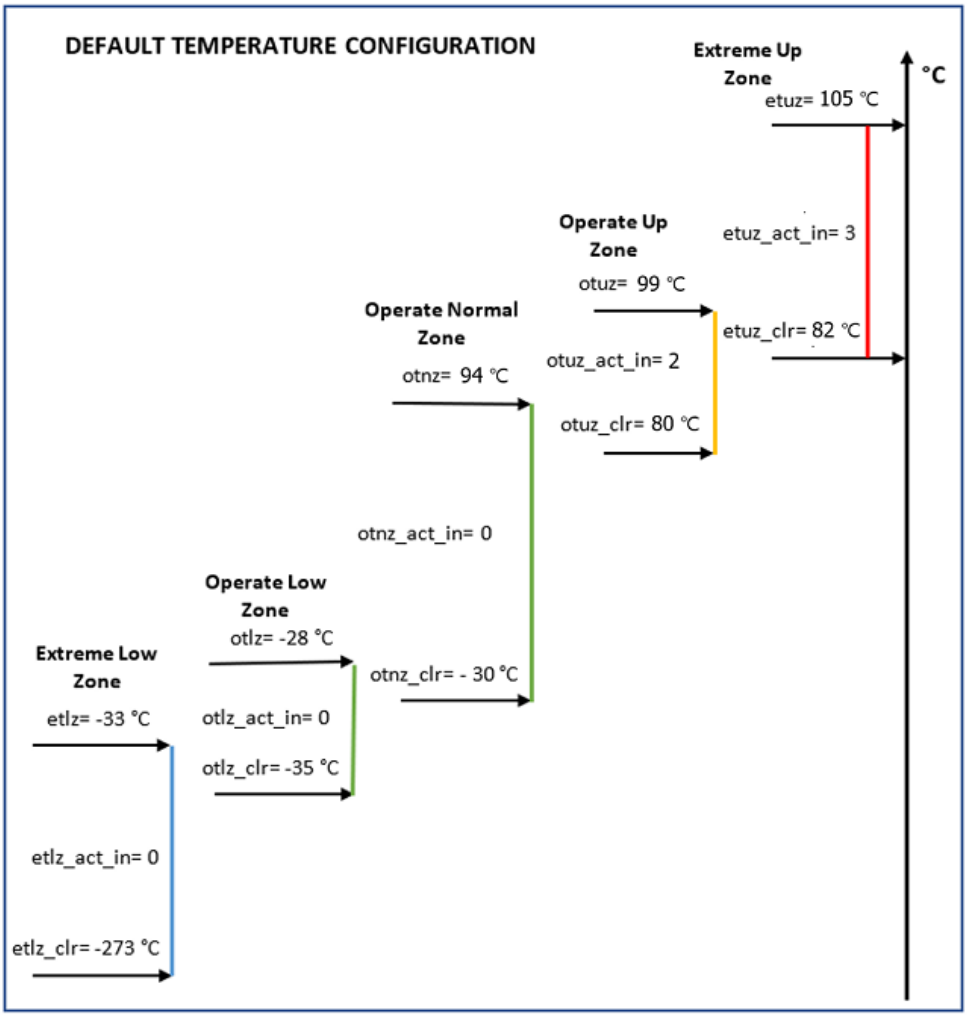
State 3 is **Operate up zone**

State 4 is **Extreme up zone**



After moving to zone with activity 3(emergency call only), only when moving to zone with activity 0(no mitigation) the device will register to the network.

<action> for high-zone can't be <no action> or <data throttling>.

<action> for extreme high zone can't be <no action> or <data throttling> or <tx backoff>.

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- AT#TEMPCFG= -273,-33,3,-35,-28,2,-30,80,0,78,90,3,88,105,3
  OK

  Rules 1 and 2 are respected.

zone	thr_clr	thr	action_in
Extreme low zone	-273	-33	3: emergency call only
Operate low zone	-35	-28	2: TX back off
Operate normal zone	-30	80	0: no mitigation
Operate up zone	78	90	3: emergency call only
Extreme up zone	88	105	3: emergency call only

- AT#TEMPCFG=-273,-33,3,-35,-28,2,-30,**80**,0,**79**,90,3,88,105,3
  +CME ERROR: operation not supported

  Rule 1 is not respected - Hysteresis is lesser than 2 deg :

  (**thr** of Operate normal zone) - (**thr_clr** of Operate up zone) = 1 < 2

zone	thr_clr	thr	action_in
Extreme low zone	-273	-33	3: emergency call only
Operate low zone	-35	-28	2: TX back off
Operate normal zone	-30	**80**	0: no mitigation
Operate up zone	**79**	90	3: emergency call only
Extreme up zone	88	105	3: emergency call only

- AT#TEMPCFG=-273,-33,3,-35,-28,2,-30,**80**,0,78,90,3,**81**,105,3
  +CME ERROR: operation not supported

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Rule 2 is not respected - free temperature range is lesser then -20 deg :

(**thr_clr** of Extreme up zone) - (**thr** of Operate normal zone) = 1 < 2

zone	thr_clr	thr	action_in
Extreme low zone	-273	-33	3: emergency call only
Operate low zone	-35	-28	2: TX back off
Operate normal zone	-30	**80**	0: no mitigation
Operate up zone	78	90	3: emergency call only
Extreme up zone	**81**	105	3: emergency call only

Not Subject to NDA

3.15.10. AT#GPIO - General Purpose Input/Output Pin Control

General Purpose Input/Output Pin Control

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	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 configuration for the three parameters are valid.

Parameters:

Name	Type	Default	Description
<pin>	integer	-	GPIO pin number. supported range is from 1 to a value that depends on the hardware.
<mode>	integer	0	This parameter's meaning depends on **<dir>** setting. Refer to Additional info sections.

Values:

0 : remove any Pull-up/Pull-down if <dir>=0 - INPUT; output pin cleared to 0 (Low) if <dir>=1 - OUTPUT

1 : remove any Pull-up/Pull-down if <dir>=0 - INPUT; output pin set to 1 (High) if <dir>=1 - OUTPUT

2 : Reports the read value from the input pin if <dir>=0 or 1 - INPUT or OUTPUT

3 : enable Pull-Up if <dir>=0 - INPUT

Not Subject to NDA

4 : enable Pull-Down if <dir>=0 - INPUT

<dir>	integer	0	GPIO pin direction Refer to additional info for details of Alternate functions.

Values:

0 : Pin direction is INPUT

1 : Pin direction is OUTPUT

2÷19 : pin direction is Alternate Function

<save>	integer	0	GPIO pin save configuration

Values:

0 : Pin configuration is not saved

1 : Pin configuration is saved

Additional info:

- when **<save>** is omitted the configuration is stored only if user set or reset ALTx function on **<dir>** parameter.

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

  #GPIO: <dir>,<stat>

  Reports a no meaning value if ALTERNATE FUNCTION

Not Subject to NDA

Name	Type	Default	Description
<dir>	integer	-	Current direction setting of the **GPIO<pin>**
<stat>	integer	-	- 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.

▶▶ **<dir>** values from 2 to 19 select an alternate function ranging respectively from ALT1 to ALT18.

ALTx	Function associated to ALTx
ALT1 (<dir>=2)	valid for GPIO1 as "SLED"
ALT2 (<dir>=3)	valid for all GPIOs: alternate function is "Alarm Pin"
ALT3 (<dir>=4)	valid for all GPIOs as "TempMon Pin"
ALT4 (<dir>=5)	valid for all GPIOs as "AD_Det Pin"
ALT5 (<dir>=6)	valid for all GPIOs as "AD_Rep Pin"
ALT6 (<dir>=7)	valid for all GPIOs as "FASTSHDN"
ALT7 (<dir>=8)	valid for GPIO4 as "WKIO"
ALT8 (<dir>=9)	valid for ALL "FRATTRIGGER"
ALT9 (<dir>=10)	valid for ALL "HSGC"
ALT10 (<dir>=11)	valid for GPIO8 as "SWREADYEN"
ALT11 (<dir>=12)	valid for ALL GPIOs as "I2C commands"
ALT12 (<dir>=13)	valid for GPIO8 as "W_DISABLE of PSMWDISACFG"
ALT13 (<dir>=14)	valid for GPIO10 as "VBUS control of PSMWDISACFG"
ALT14 (<dir>=15)	reserved
ALT15 (<dir>=16)	valid for all GPIOs as "Dying GASP"

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ALT16 (<dir>=17)	valid for all GPIOs as "Antenna Control 0"
ALT17 (<dir>=18)	valid for all GPIOs as "Antenna Control 1"
ALT18 (<dir>=19)	valid for all GPIOs as "Kernel GPIO Driver"

- ALT6, ALT11, ALT12, ALT13, ALT15, ALT18 can't be set via #GPIO

- SLED & SWREADYEN will work depending on HW version and are assigned to ALT1 & ALT10 by default.

- To activate SLED by default, #SLED command should be set to <mode>=2 after setting ALT1 as follows. (See #SLED, #SLEDSAV command)

```
AT#GPIO=1,0,2
OK
AT#SLED=2
OK
AT#SLEDSAV
OK
```

- ALT6 is available for all GPIOs and this value is only possible to set by **#FASTSHDN**.

- ALT15 is available for all GPIOs and this value is only possible to set by **#DGEN**.

- LE910C1-EUX/SAX/SVX and LE910Cx-WWX don't support "ALT18".

- While using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and shall be avoided.

- While GPIO**<pin>** in used by ALT function, it cannot be set as GPIO output or any other ALT function before the original ALT released or change it to GPIO input (default state).

Not Subject to NDA

AT#GPIO?

Reports the read direction and value of all **GPIO** pins, in the format:

#GPIO: <dir>,<stat>[<CR><LF>#GPIO: <dir>,<stat>[...]]

where:

<dir> - Refer to Set section

<stat> - Refer to Set section

If **<mode> = 3** or **4**, the output format is:

#GPIO: <dir>,<stat>,<mode>[<CR><LF>#GPIO: <dir>,<stat>,<mode>[...]]

AT#GPIO=?

Test command reports the supported range of values of the command parameters.

<pin>, <mode>,<dir>,<save>

Not Subject to NDA

Examples of Set section

- **AT#GPIO=?**

  #GPIO: (1-10),(0-4),(0-14,16-19),(0,1)

  OK

- **AT#GPIO**=3,1,1 // setting GPIO3 as output and value is HIGH

  OK

- **AT#GPIO**=4,1,1,1 // setting GPIO4 as output and value is HIGH and GPIO pin save configuration

  OK

- **AT#GPIO**=3,2 // report GPIO3 state

  #GPIO: 1,1

  OK

- **AT#GPIO?** // read command

  #GPIO: 1,1 // GPIO1 is output and output value is HIGH

  #GPIO: 0,0

  #GPIO: 1,1

  #GPIO: 0,0

  #GPIO: 0,1 // GPIO5 is input and input value is HIGH

  #GPIO: 1,0

  #GPIO: 0,0

  #GPIO: 11,1

  #GPIO: 0,0

  #GPIO: 0,0

  OK

Not Subject to NDA

3.15.11. AT#ALARMPIN - Alarm Pin Configuration

This command allows to configure the ALARM Pin.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ALARMPIN=<pin>

Set command allows to set a GPIO pin as ALARM pin.

Configuring a GPIO pin as ALARM pin is equivalent to setting it up with the ALT2 alternate function. Therefore, a GPIO pin can be configured as ALARM pin also through the **#GPIO** command. To have information on GPIO pins refer to document [1].

Parameter:

Name	Type	Default	Description
<pin>	integer	0	GPIO pin number. Max is the number of GPIO pins provided by the module. For information on the available GPIO pins use the test command.

Values:

0 : no ALARM pin set

1÷Max : GPIO pin number

AT#ALARMPIN?

Read command returns the current value of the parameter **<pin>** in the format:

Not Subject to NDA

#ALARMPIN: <pin>

AT#ALARMPIN=?

Test command returns the supported values of parameter <pin>.

Not Subject to NDA

3.15.12. AT#SLED - STAT_LED GPIO Setting

The command configures the behavior of the **STAT_LED** GPIO.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#SLED=<mode>[,<onDuration>[,<offDuration>]]

Set command sets the behaviour of the **STAT_LED** GPIO.

Parameters:

Name	Type	Default	Description
<mode>	integer	2	defines the **STAT_LED** GPIO behavior. Values: 0 : GPIO tied low 1 : GPIO tied high 2 : GPIO is handled with specific timings. See Additional info section 3 : GPIO is turned ON/OFF alternatively, with period defined by the sum <onDuration> + <offDuration> 4 : GPIO is handled with specific timings. See Additional info section 5 : status led disabled
<onDuration>	integer	10	duration of period in which **STAT_LED** GPIO is tied high while **<mode>**=3 Value:

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	1÷100 : in tenth of seconds		
<offDuration>	integer	10	duration of period in which **STAT_LED** GPIO is tied low while **<mode>**=3 Value: 1÷100 : in tenth of seconds

Additional info:

- **<mode>**=2, the timings of **STAT_LED** GPIO are:
  - not registered: always ON
  - registered in idle: blinking 1 s ON and 2 s OFF
  - registered in idle with power saving: blinking time depends on network condition to minimize power consumption

- **<mode>**=4, the timings of **STAT_LED** GPIO are:
  - not registered: blinking 0,5 s ON and 0,5 s OFF
  - registered in idle: blinking 300 ms ON and 2,7 s OFF
  - registered in idle with power saving: blinking time depends on network condition to minimize power consumption

In LE910, GPIO will be set to default (gpio in).

When module boots the **STAT_LED** GPIO is always tied High and it holds this value until the first NVM reading.

SLED function of a GPIO corresponds to ALT1 function of the GPIO, So ALT1 function should be set through **AT#GPIO** command.

On miniPCIe modules **STAT_LED** GPIO cannot be driven and

Not Subject to NDA

therefore it must be disabled by setting <**mode**>= 5 (status led disabled).

AT#SLED?

Read command returns the STAT_LED GPIO current setting, in the format:

#SLED: <mode>,<onDuration>,<offDuration>

AT#SLED=?

Test command returns the range of available values for parameters <**mode**>, <**onDuration**> and <**offDuration**>.

The setting is saved using the **#SLEDSAV** command.

Not Subject to NDA

3.15.13. AT#SLEDSAV - Save STAT_LED GPIO Setting

This command allows to save the current **STAT_LED** GPIO setting.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#SLEDSAV

Execution command saves the **STAT_LED** GPIO setting in NVM.

AT#SLEDSAV=?

Test command returns **OK** result code.

Not Subject to NDA

3.15.14. AT#SWREADYEN - SW READY ENable

This command used to enable/disable Software ready LED.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SWREADYEN=<en>

Set command enable/disable sw ready led as indicator for that the modem software completed its initialization.

Parameter:

Name	Type	Default	Description
<en>	integer	1	enable/disable sw ready led
	Values:		
	0 : sw ready led will always be in 'off' state		
	1 : sw ready led will be 'on' after modem sw initialization		

The default value of parameter **<en>** is 0 (off) in LE910C1-EU/NF/LA (4G+2G).

AT#SWREADYEN?

Read command reports the current setting of sw ready enable.

#SWREADYEN: <en>

<en> - see description above.

AT#SWREADYEN=?

Test command reports the supported range of values for parameter <en>.

Not Subject to NDA

The setting is saved automatically in NVM.

Not Subject to NDA

3.15.15. AT#ADC - Read Analog/Digital Converter Input

This command returns the current voltage value of the specified ADC inputs, expressed in mV.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ADC=[<adc>,<mode>[,<dir>]]

Execution command reads selected **<adc>** pin voltage, converts it by baseband internal ADC and prints outs the result as shown in Additional info section.

Parameters:

Name	Type	Default	Description
<adc>	integer	1	index of input pin Value: 1÷n : input pin index. For the number of available ADCs see document [1]
<mode>	integer	2	required action Value: 2 : query ADC value
<dir>	integer	0	direction. Its interpretation is currently not implemented.

Not Subject to NDA

Value:

0 : no effect

Additional info:

Format of the message printed out by the execution command:

#ADC:<value>

Name	Type	Default	Description
<adc>	integer	-	pin voltage expressed in mV.

The command returns the last valid measure.

AT#ADC?

Read command reports all pins input voltage 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>**.

Not Subject to NDA

3.15.16. AT#V24CFG - V24 Output Pins Configuration

This command sets the AT commands serial port interface output pins mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#V24CFG=<pin>,<mode>[,<save>]

Set command sets the AT commands serial port interface output pins mode.

Parameters:

Name	Type	Default	Description
<pin>	integer	N/A	AT commands serial port interface hardware pin
	Values:		
	0 : DCD (Data Carrier Detect)		
	1 : CTS (Clear To Send)		
	2 : RI (Ring Indicator)		
	3 : DSR (Data Set Ready)		
	4 : DTR (Data Terminal Ready)		
	5 : RTS (Request To Send)		
	6 : RXD (Receive Data)		
	7 : TXD (Transmit Data)		
<mode>	integer	0	AT commands serial port interface hardware pins mode
	Values:		

Not Subject to NDA

0 : AT commands serial port mode: the V24 pins are controlled by the serial port device driver

1 : GPIO mode: output pins can be managed through the AT#V24 command only

2 : GPIO Kernel mode: output pins directly controlled by kernel GPIO driver

<save>	integer	N/A	Save V24 pin configuration

Values:

0 : Pin configuration is not saved

1 : Pin configuration is saved

If **<mode>** is set to 2, output pins directly can't be controlled by **#V24** command, **<save>** parameter should be set to 1, module must be reboot, the pins configuration is applied next power cycle and pins directly controlled by **kernel GPIO driver**.

If **<save>** parameter is omitted, the value of **<mode>** is changed as default mode from next power cycle.

Changing V24 pins configuration may affect the cellular module functionality set through **+CFUN**.

If **<pin>**=4 is set to **<mode>**=2 or 1, **<save>** parameter should be set to 1, module must be reboot, pin configuration is applied next power cycle. Changing from **<mode>**=2 or 1 to **<mode>**=0, module must be reboot.

If **<pin>**=1, 5 ,6 or 7 is set to **<mode>**=2 or 1, **<save>** parameter should be set to 1, module must be reboot, pin configuration is applied next power cycle. The unset pins of 4 pins don't work as UART pin. Changing from **<mode>**=2 or 1 to **<mode>**=0, module must be reboot.

Not Subject to NDA

The default value of parameter **<mode>** for pin0, pin2 and pin3 is 2 in LE910C1-EU/NF/LA (4G+2G).

For LE910C1-EUX/SAX/SVX and LE910Cx-WWX product:

- Not support CTS/RTS/RXD/TXD/DTR pins
- Not support GPIO Kernel mode
- DTR pin can't be set as GPO when #M2MATP is '1'.

AT#V24CFG?

Read command returns actual mode for all the pins (either output and input) in the format:

#V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF>
#V24CFG: <pin2>,<mode2>[...]]

AT#V24CFG=?

Test command reports supported range of values for parameters **<pin>**,**<mode>** and **<save>**.

Not Subject to NDA

3.15.17. AT#V24 - V24 Output Pins Control

This command sets the state of the output pins of the AT commands serial port interface.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#V24=<pin>[,<state>]

Set command sets the AT commands serial port interface output pins state.

Parameters:

Name	Type	Default	Description
<pin>	integer	N/A	AT commands serial port interface hardware pin: Values: 0 : DCD (Data Carrier Detect) 1 : CTS (Clear To Send) 2 : RI (Ring Indicator) 3 : DSR (Data Set Ready) 4 : DTR (Data Terminal Ready) 5 : RTS (Request To Send) 6 : RXD (Receive Data) 7 : TXD (Transmit Data)
<state>	integer	N/A	State of AT commands serial port interface output hardware pins (0,1, 2, 3, 4, 5, 6, 7) when pins are in GPIO mode (see **AT#V24CFG**):

Not Subject to NDA

Values:

0 : Low state

1 : High state

If **<pin>** is set to **<mode>**=2 by **#V24CFG**, the **<state>** is not actual state because pin is controlled by **kernel GPIO driver**.

If **<pin>**=1, 5, 6 or 7 is set to **<mode>**=2 or 1 by **#V24CFG**, the state of the unset pins returns 1. (see **#V24CFG**)

If **<pin>**=6 or 7 works as UART pin, the state of the pins is not actual state because pins are controlled by **UART driver**

For LE910C1-EUX/SAX/SVX and LE910Cx-WWX product:

- Not support CTS/RTS/RXD/TXD/DTR pins.

- Not support GPIO Kernel mode.

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>[...]]

AT#V24=?

Test command returns the supported values of parameters **<pin>** and **<state>**.

Not Subject to NDA

3.15.18. AT#I2CWR - Write to I2C

This command is used to send data to an I2C peripheral connected to module.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#I2CWR=<sdaPin>,<sclPin>,<deviceId>,<registerId>,<len>

Execution command sends data to an I2C peripheral connected to module GPIOs. After the writing activity has been accomplished, the GPIOs will not be restored to the original setting. Use **#GPIO** command to see the status of the used GPIOs. To have information on GPIO pins refer to document [1].

Parameters:

Name	Type	Default	Description
<sdaPin>	integer	-	GPIO number for SDA. To know the range use **#I2CWR** test command.
<sclPin>	integer	-	GPIO number for SCL. To know the range use **#I2CWR** test command.
<deviceId>	hex	N/A	address of the I2C device (7 bits). The Least Significant Bit is used for read/write command, but in this **#I2CWR** implementation, it doesn't matter if the LSB is set to 0 or 1. Address must be written in hexadecimal form without 0x. 10 bit address is also supported. Value: 0÷3FF : addressing range extended to 10 bit

Not Subject to NDA

<registerId>	hex	N/A	register to write data to
	Value:		
	0÷FF	:	value must be written in hexadecimal form without 0x
<len>	integer	N/A	number of data to send
	Value:		
	1÷254	:	number of data to send

Additional info:

- After entering the command, the module returns 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). Data must be written in hexadecimal form.

  If data are successfully sent, the response is **OK**, otherwise an error code is reported.

AT#I2CWR=?

Test command returns the range of available values for parameters <**sdaPin**>, <**sclPin**>, <**deviceId**>, <**registerId**>, <**len**>.

Not Subject to NDA

Set GPIO_2 as SDA, and GPIO_3 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 starting from register 0x10.

```
AT#I2CWR=2,3,20,10,14
> 00112233445566778899AABBCCDD<ctrl-z>
OK
```


Not Subject to NDA

3.15.19. AT#I2CRD - Read from I2C

This command is used to read data from an I2C peripheral connected to module.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#I2CRD=<sdaPin>,<sclPin>,<deviceId>,<registerId>,<len>

Execution command reads data from an I2C peripheral connected to module GPIOs. After the reading activity has been accomplished, the GPIOs will not be restored to the original setting. Use **#GPIO** command to see the status of the used GPIOs. To have information on GPIO pins refer to document [1].

Parameters:

Name	Type	Default	Description
<sdaPin>	integer	-	GPIO number for SDA. To know the range use **#I2CRD** test command.
<sclPin>	integer	-	GPIO number for SCL. To know the range use **#I2CRD** test command.
<deviceId>	hex	N/A	address of the I2C device (7 bits). The Least Significant Bit is used for read/write command, but in this **#I2CCF** implementation, it doesn't matter if the LSB is set to 0 or 1. Address must be written in hexadecimal form without 0x. 10 bit address is also supported
	Value:		

Not Subject to NDA

	0÷3FF : addressing range extended to 10 bit		
<registerId>	hex	N/A	Register to read data from Value: 0÷FE : value must be written in hexadecimal form without 0x
<len>	integer	N/A	Number of data to receive 20. Data Read from I2C will be dumped in hexadecimal format 21. If data requested are more than data available in the device, dummy data (normally 0x00 or 0xff) will be dumped Value: 1÷254 : number of data to receive

AT#I2CRD=?

Test command returns the range of available values for parameters <**sdaPin**>, <**sclPin**>, <**deviceId**>, <**registerId**>, <**len**>.

Read 12 bytes from I2C device with address 0x20, starting from register address 0x10. SDA is mapped on GPIO_02, SCL is mapped on GPIO_03.

```
AT#I2CRD=2,3,20,10,12
#I2CRD: 00112233445566778899AABBCC
OK
```


Not Subject to NDA

3.15.20. AT#I2CCF - Combined Format for I2C Writing and Reading

This command is used to write and read data to/from an I2C device using the I2C Combined Format. The module acts as an I2C master.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#I2CCF=<sdaPIn>,<sclPin>,<deviceId>,<lenwr>,<lenrd>

This command is used to write and read data to/from an I2C device using the I2C Combined Format. The module as master transmits data to the slave device and then, reads data from it through two GPIOs

Parameters:

Name	Type	Default	Description
<sdaPIn>	integer	-	GPIO number for SDA. To know the range use **#I2CCF** test command.
<sclPin>	integer	-	GPIO number for SCL. To know the range use **#I2CCF** test command.
<deviceId>	hex	N/A	address of the i2c device (7 bits). The Least Significant Bit is used for read/write command, but in this **#I2CCF** implementation, it doesn't matter if the LSB is set to 0 or to 1. Address must be written in hexadecimal from without 0x. Value: 0÷3FF : addressing range extended to 10 bit
<lenwr>	integer	N/A	number of data to write. Value: 0÷254 : number of data to write.
<lenrd>	integer	N/A	number of data to read.

Not Subject to NDA

Value:

0÷254 : number of data to read.

Additional info:

- After entering the command, and if <lenwr> > 0, the module returns the prompt ">" and waits for the data to send. To complete the operation enter Ctrl-Z char (0x1A hex); to exit without writing the message enter ESC char (0x1B hex).

  Data must be written in hexadecimal form without 0x.

  If data are successfully sent, the response is OK, otherwise an error code is reported.

AT#I2CCF=?

Test command returns the range of available values for parameters <sdaPin>, <sclPin>, <deviceId>, <lenwr>, <lenrd>.

Set GPIO_2 as SDA, GPIO_3 as SCL; Device I2C address is 0x20;
First is send data 0x0a; after a "RESTART", 4 data bytes are read

```
AT#I2CCF=2,3,20,1,4
>0a<ctrl-z>
#I2CCF: abcdef12

OK
```

The sequence is following:

START - 0x20- 0x0a -RESTART - 0X21 - data read 1 -...- data read 4 - STOP

Not Subject to NDA

3.15.21. AT#SPIEN - Enable SPI Configuration

This command used to enable/disable SPI configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SPIEN=<mode>

Set command enables SPI configuration.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	mode
	Values:		
	0 : Disable SPI configuration		
	1 : Enable SPI configuration		

Manual reboot is required after changing.

Change value is stored on module and applied after next power cycle.

If **<mode>** is 0, interface is configured as UART 2 Port (See "Hardware User Guide section 3.1") and setting values configured by **#SPICFG** are initialized.

This command is synchronized with variant 17 of **#PORTCFG** in LE910C1-EUX/SAX/SVX and LE910Cx-WWX product. If SPI is enabled, the request value of **#PORTCFG** is changed to 17 at the same time.

Not Subject to NDA

AT#SPIEN?

Read command show current **<mode>** in the following format

#SPIEN: <mode>

AT#SPIEN=?

Test command returns the range of supported values.

Not Subject to NDA

3.15.22. AT#SPICFG - SPI Pins Configuration

This command used to configure SPI pins for multiple slave supporting.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SPICFG=<ID>[,<CS>[,<interrupt>[,<slave_ready_GPIO>]]]

Set command configures CS (Chip Select), interrupt pin and slave ready GPIO for multiple slave supporting.

Parameters:

Name	Type	Default	Description
<ID>	integer Value: 0÷2 :	N/A	SPI context identifier numeric parameter which specifies a SPI definition
<CS>	integer	-	Chip select GPIO number
<interrupt>	integer	-	GPIO number; GPIO can be configured as an interrupt source of a SPI master device. This allows a SPI slave device to notify the SPI master device of data being transferred.
<slave_ready_GPIO>	integer	-	GPIO number; GPIO can be configured for slave ready state. If SPI master device receives the ready state (active low state) from slave device, SPI master device allows SPI read/ write operation.

Not Subject to NDA

- Manual reboot is required after changing.
- All configurations are stored on module and applied after next power cycle.
- When SPI is enabled through **#SPIEN=1**, this operation can be worked.
- The first **<CS>** value is always 0 because it is dedicated SPI_CS pin (See "Hardware User Guide section 3.1")
- It has highest priority than other functions when SPI configuration enabled and GPIO is used as SPI operation. Customer should not use GPIO for other function.

AT#SPICFG?

Read command returns the current settings of **#SPICFG**.

#SPICFG: <ID>,<CS>,<interrupt>,<slave_ready_GPIO><CR><LF>
#SPICFG: <ID>,<CS>,<interrupt>,<slave_ready_GPIO><CR><LF>
#SPICFG: <ID>,<CS>,<interrupt>,<slave_ready_GPIO><CR><LF>

AT#SPICFG=?

Test command returns the range of supported values.

Not Subject to NDA

- AT#SPICFG?
  #SPICFG: 0,0,2,5
  #SPICFG: 1,8,3,6
  #SPICFG: 2,9,4,7

  OK

  AT#SPICFG=0
  OK

  AT#SPICFG=1
  OK

  AT#SPICFG=2
  OK

  AT#SPICFG?
  #SPICFG: 0,0,0,0
  #SPICFG: 1,0,0,0
  #SPICFG: 2,0,0,0

  OK

Not Subject to NDA

3.15.23. AT#HSICEN - Enable HSIC Configuration

This command used to configure HSIC mode as slave or master.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#HSICEN=<mode>

Set command sets HSIC configuration as HSIC master or HSIC slave mode.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	HSIC mode
	Values: 0 : Disable HSIC configuration 1 : Enable HSIC master mode 2 : Enable HSIC slave mode		

- Manual reboot is required after changing.
- The setting is maintained even after firmware updates.
- If **<mode>**=2, USB interface doesn't work.
- The default value of **<mode>** is 1 in LE910C1-EU/NF/LA (4G+2G).

AT#HSICEN?

Read command show current **<mode>** in the following format

Not Subject to NDA

#HSICEN: <mode>

AT#HSICEN=?

Test command returns the range of supported values.

Not Subject to NDA

3.15.24. AT#RXDIV - Enable RX Diversity and Set DARP

This command enables the RX Diversity and sets DARP.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RXDIV=<divEnable>,<DARPMode>

Set command enables/disables the RX Diversity and sets DARP.

Parameters:

Name	Type	Default	Description
<divEnable>	integer	1	enable/disable the RX Diversity

Values:

0 : disable

1 : enable

6 : Test mode. The main antenna port is used for the Tx chain; second antenna port is used as the only Rx chain

<DARPMode>	integer	1	select DARP mode

Values:

0 : DARP not supported

1 : DARP phase 1

The values set by command are available at next power-on.

Not Subject to NDA

AT#RXDIV?

Read command reports the currently selected <**divEnable**> and <**DARPMode**> parameters in the format:

#RXDIV: <DivEnable>,<DARPMode>

AT#RXDIV=?

Test command reports the supported values of parameters <**divEnable**> and <**DARPMode**>.

- The values set by command are directly stored in NVM, and they are available at next power on.

Not Subject to NDA

3.15.25. AT#GSMAD - GSM Antenna Detection

Set the behavior of the antenna detection algorithm. To use this command, the module must be provided by a specific circuitry, refer to document [1].

[1] Telit Antenna Detection Application Note, 80000NT10002A

[2] Telit Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#GSMAD=<mod>[,<urcmode>[,<interval>[,<detGPIO>[,<repGPIO>[,<antenna>[,<adc>]]]]]]

Set command sets the behavior of antenna detection algorithm. Refer to document [2] to have information on GPIO pins.

Parameters:

Name	Type	Default	Description
<mod>	integer	0	selects the antenna detection mode. Refer to Additional info section. Values: 0 : antenna detection not active; format is AT#GSMAD=0[,<adc>] 1 : periodic activation of the antenna detection 2 : instantaneous activation of the antenna detection 3 : as <mod>=2, but the command does not return the control until the detection algorithm ended
<urcmode>	integer	0	selects the URC presentation mode. It has meaning and can be set only if **<mod>=1**.

Not Subject to NDA

	Values: 0 : disable the antenna detection URC 1 : enable the antenna detection URC		
<interval>	integer	120	interval between two consecutive antenna detection algorithm runs. It is expressed in seconds, and has meaning only if **<mod>=1**. Value: 1÷3600 : seconds
<detGPIO>	integer	0	defines which GPIO pin is used by the antenna detection algorithm as input. The chosen GPIO must be configured in alternate function, refer to **#GPIO** command. Values: 0 : no GPIO pin is used 1÷max : max value depends on the module hardware
<repGPIO>	integer	0	defines which GPIO pin is used by the antenna detection algorithm (as output) to report antenna status. It has meaning only if **<mod>=1**. The chosen GPIO must be configured in alternate function, refer to **#GPIO** command. Value 0 means that no report is made using GPIO (default 0). Values: 0 : no GPIO is used 1÷max : max value depends on the module hardware

Not Subject to NDA

<antenna>	integer	1	index of requested antenna. Values: 1 : Main 2 : DIV 3 : GPS
<adc>	integer	1	index of requested ADC Values: 1 : ADC1 2 : ADC2 3 : ADC3

Additional info:

- <mod>=1

  The command starts the antenna detection every <interval> period, and uses the <detGPIO> pin to detect the antenna status. If the algorithm detects an antenna status change and the <urcmod>=1, the user is notified by the following URC:

  #GSMAD: <antenna>,<presence>

- <mod>=2

  The command starts instantaneously the main antenna detection. if the algorithm detects a change in the main antenna status the module is notified by URC.

  This modality is obsolete and is maintained only for backward compatibility. We suggest to use the modality 3

Not Subject to NDA

▶▶ <mod>=3

The command starts instantaneously the main antenna detection as in <mod>=2, but the command does not return the control until the detection algorithm ended. The returned value is the antenna status just detected. The returned value is the antenna <presence> status just detected and it format is:

#GSMAD: <antenna>,<presence>
OK

The instantaneous activation does not affect a periodic activation eventually started before.

Unsolicited fields:

Name	Type	Description
<antenna>	integer	antenna Values: 1 : Main (default) 2 : DIV 3 : GPS
<presence>	integer	returns information on the antenna status. Values: 0 : antenna connected 1 : antenna connector short circuited to ground 2 : antenna connector short circuited to power 3 : antenna not detected (open circuit)

Not Subject to NDA

- last <**urcmode**> settings are saved as extended profile parameters.
- GPIO is set to LOW when antenna is connected. Set to HIGH otherwise
- #GSMAD parameters, excluding <urcmode>, are saved in NVM.

AT#GSMAD?

Read command returns the current parameter settings for **#GSMAD** command in the format:

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

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

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

AT#GSMAD=?

Test command reports the supported range of values for parameters <**mod**>, <**urcmode**>, <**interval**>, <**detGPIO**>, <**repGPIO**>, <**antenna**> and <**adc**>.

Not Subject to NDA

3.15.26. AT#VAUX - Auxiliary Voltage Output Control

This command configures the Auxiliary Voltage output pin.

[1] Hardware User's Guide of the used module

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#VAUX=[<n>,<stat>]

Set command enables/disables the Auxiliary Voltage output pin. To have information on VAUX pin refer to document [1].

Parameters:

Name	Type	Default	Description
<n>	integer	1	VAUX pin index Value: 1 : only one VAUX pin is available
<stat>	integer	1	Enable/disable VAUX output or get its status Values: 0 : disables output 1 : enables output 2 : gets current VAUX pin status

Additional info:

- When **<stat>**=2 and command is successful, it returns:
  #VAUX: <value>

Not Subject to NDA

Name	Type	Default	Description
<value>	integer	N/A	gives information about the output pin status. Values: 0 : output is disabled 1 : output is enabled

The current setting is stored through **#VAUXSAV**.

set command will not work and always return ERROR if the WLAN started.

AT#VAUX?

Read command reports whether the Auxiliary Voltage pin output is currently enabled or not, in the format:

#VAUX: <value>

AT#VAUX=?

Test command reports the supported range of value for parameters **<n>** and **<stat>**.

Not Subject to NDA

3.15.27. AT#VAUXSAV - Auxiliary Voltage Output Save

This command allows to save the current state of the Auxiliary Voltage output pin in NVM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#VAUXSAV

Execution command saves the current state of VAUX pin in NVM. The state will be reloaded at the next power on.

AT#VAUXSAV=?

Test command returns **OK** result code.

Not Subject to NDA

3.15.28. AT#TEMPMON - Temperature Monitor

This command is used to retrieve internal temperature information of the module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TEMPMON=<mod>[,<urcMode>[,<action>[,<GPIO>]]]

Set command sets the behavior of the module internal temperature monitor.

#TEMPMEAS: <level>,<value>

The temperature monitoring message parameters are described in the Unsolicited fields section.

Parameters:

Name	Type	Default	Description
<mod>	integer	N/A	select the temperature monitoring mode. Values: 0 : sets the command parameters 1 : triggers the measurement of the module internal temperature, reporting the result using the format shown above
<urcMode>	integer	1	URC presentation mode Values: 0 : disables the presentation of the temperature monitoring URC.

Not Subject to NDA

1 : enables the presentation of the temperature monitoring URC, whenever the module internal temperature reaches either operating or extreme levels.

<action>	integer	1	sum of integers, each representing the action to be done whenever the module internal temperature reaches either operating or extreme levels.

Values:

0 : no action

1 : (01) Activating of thermal mitigation according to thermal configuration file.

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

3 : (11) This value contains <action=1> and <action=2> i.e. activate thermal mitigation and a GPIO indication. If this <action> is required, it is mandatory to set the <GPIO> parameter too.

<GPIO>	integer	-	GPIO number. Valid range is any GPIO pin as described in **#GPIO** command. This parameter is needed and required only if **<action>** 2 or 3 is enabled.

Unsolicited fields:

Name	Type	Description
<level>	integer	threshold level (see Note1) Values: -2 : Extreme temperature lower bound.

Not Subject to NDA

	-1 :	Operating temperature lower bound.
	0 :	normal temperature.
	1 :	Operating temperature upper bound.
	2 :	Extreme temperature upper bound.
<value>	integer	actual temperature expressed in degrees Celsius.

AT#TEMPMON?

Read command reports the current parameter settings for the command in the format:

#TEMPMON: <urcMode>,<action>[,<GPIO>]

AT#TEMPMON=?

Test command reports the supported range of values for parameters <**mod**>, <**urcMode**>, <**action**>, and <**GPIO**>.

- Thresholds levels are defined in **#TEMPCFG** command. See there for detailed description on thermal mitigation configuration.
- Last <**GPIO**> is saved in the NVM.
- Thermal mitigation is disabled automatically when using laboratory test SIM.

Not Subject to NDA

3.15.29. AT#QTEMP - Query Temperature Overflow

This command returns if the device internal temperature is in the working range or not.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#QTEMP=[<mode>]

Set command has currently no effect. The interpretation of parameter <**mode**> currently not implemented. The value assigned to it will simply have no effect.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	mode Value: 0 : returns "OK"

AT#QTEMP?

Read command queries the device internal temperature sensor for over temperature and reports the result in the format:

#QTEMP: <temp>

where:

<temp> - over temperature indicator
0 - The device temperature is in the working range.
1 - The device temperature is out of the working range.

See note for working range definition.

AT#QTEMP=?

Not Subject to NDA

Test command reports supported range of values for parameter <**mode**>.

Working range is the normal range as defined in **#TEMPCFG** command.

Working range default value is (-30°C...+80°C).

The device should not be operated out of its working temperature range, elsewhere proper functioning of the device is not ensured.

Not Subject to NDA

3.15.30. AT#TESTMODE - Test Mode Configuration

Set module in test mode for configuring and testing the POWER level.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TESTMODE=<cmd>

The command allows to execute some CT commands through AT interface. 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 CT commands. To exit from Test Mode and go back to Operative Mode, the command **AT#TESTMODE** ="**OM**" has to be sent.

AT#TESTMODE= "CT_command"

Parameter:

Name	Type	Default	Description
<cmd>	string	N/A	"CT_command": this string corresponds to a CT command. To be accepted by AT#TESTMODE, the CT command has to belong to the following list of CT commands enabled for this use:

Values:

"TM"	:	forces the module in Test Mode
"OM"	:	forces the module in Operative Mode
"BANDS"	:	returns the list of supported bands
"SET[tech]BAND [band]"	:	sets the band of used technology (tunes the RF

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		to Mid CH by default). Refer to Note 1.
"SETLTEBW [bw]"	:	sets the bandwidth for LTE. (Before "SETLTEBW" SET command, you have to set the "SETLTEBAND" command.)
"CH [chan]"	:	sets the channel. (Before "CH" SET command, you have to set the "SET<tech>BAND" Command).
"SETCHREGION [ch_reg_idx]"	:	tunes the RF to lowest (0) / middle (1) / highest (2) channel in selected band.
"GETCH"	:	returns current channel.
"TCH"	:	starts the non-stop module transmission. (not while RXON active)
"PL [pl_val]"	:	Refer to Note 2.
"TXPDM [txpdm_val]"	:	Refer to Note 2.
"TXGAIN [txgain_val]"	:	Refer to Note 2.
"TXBURST [txburst_val]"	:	Refer to Note 2.
"RXON"	:	RX chain enable. (not while TCH active)
"LNA [lna_gain]"	:	sets the LNA Gain for GSM / WCDMA. Refer to Note 3.
"EXP [expected_pwr]"	:	expected RX power for LTE / TDSCDMA. Refer to Note 4.

Not Subject to NDA

"RL"	:	read Rx power level (Results might have +/- 3dB tolerance).
"RLDIV"	:	read diversity Rx power level (Results might have +/- 3dB tolerance). (LTE and WCDMA supported only)
"ESC"	:	exits the current non-stop sequence (stop TX transmission) and disable RX chain.

Additional info:

GSM Bands:

Band Code	Band
0	GSM 850
1	GSM 900
2	GSM 1800
3	GSM 1900

WCDMA Bands:

Band Code	Band	Frequency [MHz]
1	WCDMA I	2100
2	WCDMA II	1900
3	WCDMA III	1800
4	WCDMA IV	1700
5	WCDMA V	850
6	WCDMA VI	850 Japan
8	WCDMA VIII	900
19	WCDMA XIX	800 Japan

LTE Bands:

Band Code	Band	Frequency [MHz]
1	LTE-B1	2100

Not Subject to NDA

2	LTE-B2	1900
3	LTE-B3	1800
4	LTE-B4	1700
5	LTE-B5	850
7	LTE-B7	2600
8	LTE-B8	900
9	LTE-B9	1900
12	LTE-B12	700
13	LTE-B13	700
14	LTE-B14	700
17	LTE-B17	700
18	LTE-B18	800
19	LTE-B19	800
20	LTE-B20	800
25	LTE-B25	1900
26	LTE-B26	850
28	LTE-B28	700
34	LTE-B34	2000
38	LTE-B38	2600
39	LTE-B39	1900
40	LTE-B40	2300
41	LTE-B41	2600
66	LTE-B66	AWS-3
71	LTE-B71	600

GSM Channels:

BAND code	Channel		
	Low	Mid	High
0	128	189	251
1	975	63	124
2	512	700	884
3	512	660	809

WCDMA Channels:

BAND code	Channel		
	Low	Mid	High
I	9612	9750	9888

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II	9262	9400	9538
III	937	1112	1288
IV	1312	1412	1513
V	4132	4182	4233
VI	4163	4175	4188
VIII	2712	2787	2863
XIX	312	338	363

LTE Channels:

BAND	Channel		
	Low	Mid	High
B1	18025	18300	18575
B2	18625	18900	19175
B3	19225	19575	19925
B4	19975	20175	20375
B5	20425	20525	20625
B7	20775	21100	21425
B8	21475	21625	21775
B9	21825	21975	22125
B12	23035	23095	23155
B13	23180	23229	23279
B14	23305	23330	23355
B17	23755	23790	23825
B18	23855	23925	23995
B19	24025	24075	24125
B20	24175	24300	24425
B25	26065	26365	26665
B26	26715	26865	27015
B28	27235	27435	27635
B28 (LE910Cx-EU)	27235	27310	27385
B34	36225	36275	36325
B38	37775	38000	38225
B39	38275	38450	38625
B40	38675	39150	39625
B41	40240	40740	41240
B66	131997	132322	132647

Not Subject to NDA

B71	133147	133297	133446

GSM Recommended PL value:

BAND Code	PL	POWER Range
0	28	31-35 [dBm]
1	29	
2	26	28-32 [dBm]
3	26	28-32 [dBm]

WCDMA Recommended TXPDM value:

BAND	TXPDM	POWER Range
I	67	21 - 25 [dBm]
II	62	
III	68	
IV	61	
V	66	
VI	66	
VIII	66	
XIX	66	

LTE Recommended TXGAIN value:

BAND	TXGAIN	POWER Range
B1	66	20.3 - 25.7 [dBm]
B2	62	
B3	65	
B4	60	
B5	66	
B7	55	
B8	65	
B9	64	
B12	64	
B13	58	
B14	58	
B17	62	
B18	66	
B19	66	

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B20	66	
B25	62	
B26	64	
B28	64	
B38	53	
B39	65	
B40	53	
B41	53	
B66	60	
B71	66	

LTE Recommended SETLTEBW value:

BW	BW Value
0	1.4 MHz
1	3 MHz
2	5 MHz
3	10 MHz
4	15 MHz
5	20 MHz

BAND	BANDWIDTH					
	0	1	2	3	4	5
B1	X	X	0	0	0	0
B2	0	0	0	0	0	0
B3	0	0	0	0	0	0
B4	0	0	0	0	0	0
B5	0	0	0	0	X	X
B7	X	X	0	0	0	0
B8	0	0	0	0	X	X
B9	X	X	0	0	0	0
B12	0	0	0	0	X	X
B13	X	X	0	0	X	X
B14	X	X	0	0	X	X
B17	X	X	0	0	X	X
B18	X	X	0	0	0	X
B19	X	X	0	0	0	X
B20	X	X	0	0	0	0

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B25	0	0	0	0	0	0
B26	0	0	0	0	0	X
B28	X	X	0	0	0	0
B38	X	X	0	0	0	0
B39	X	X	0	0	0	0
B40	X	X	0	0	0	0
B41	X	X	0	0	0	0
B66	0	0	0	0	0	0
B71	X	X	0	0	0	0

Note 1: "SET[tech]BAND [band]"

"SETGSMBAND [band]" for GSM

"SETWCDMABAND [band]" for WCDMA

"SETLTEBAND [band]" for LTE

"SETTDSBAND [band]" for TD-SCDMA.

Note 2: sets TX power level as below.

for GSM in range: 0 - 31

for WCDMA in range: 0 - 100

for LTE in range: 0 - 100

for TD-SCDMA in range: 0 - 100

Note 3: sets the LNA Gain as below.

For GSM **[lna_gain]** value have to be in range 0-5.

For WCDMA **[lna_gain]** value have to be 0.

Note 4: Range for LTE / TDSCDMA systems is from -113 to 0.

Not Subject to NDA

Note 5: The string of the enabled CT command must have the correct number of parameters supported by the CT command. The parameter is not case sensitive.

Note 6: BW should set for each LTE band properly as 3GPP specification. (TS36.101 5.6.1 Channel bandwidths per operating band)

Note 7: "CH" command should be input as TX channel. It is going to auto conversion to RX channel.

AT#TESTMODE?

Read command reports the currently selected **<command>** in the format:

#TESTMODE: <testModeStatus>

Additional info:

Parameter meaning:

Name	Type	Default	Description
<testModeStatus>	integer	0	status
	Values: 0 : module is in Operative Mode 1 : module is in Test Mode		

AT#TESTMODE=?

Test command returns the **ERROR** result code.

Not Subject to NDA

Not Subject to NDA

GSM Example:

Configure TEST EQUIPMENT to band GSM I and set ARFCN = 63, PL = 29.

AT#TESTMODE="TM"

AT#TESTMODE="SETGSMBAND 1"

AT#TESTMODE="TCH"

AT#TESTMODE="PL 29"

Verify on instrument side that TX max power level is about 31-35dBm.

AT#TESTMODE="ESC"

Configure TEST EQUIPMENT to band GSM 2 and set ARFCN = 700, PL = 26.

AT#TESTMODE="TM"

AT#TESTMODE="SETGSMBAND 2"

AT#TESTMODE="TCH"

AT#TESTMODE="PL 26"

Verify on instrument side that TX max power level is about 28-32dBm.

AT#TESTMODE="ESC"

RX test:

GSM: Inject a modulated GSM signal to the unit

AT#TESTMODE="TM"

AT#TESTMODE="SETGSMBAND 2"

AT#TESTMODE="RXON"

AT#TESTMODE="LNA 0"

AT#TESTMODE="RL"

AT#TESTMODE="ESC"

To return to online mode:

AT#TESTMODE="OM" verify that module switches to operative mode.

Verify that module switches to operative mode.

WCDMA Example:

Configure TEST EQUIPMENT in not signaling mode,

Not Subject to NDA

band WCDMA I and set UARFCN =9750, TXPDM =69:

AT#TESTMODE="TM"

AT#TESTMODE="SETWCDMABAND 1"

AT#TESTMODE="TCH"

AT#TESTMODE="TXPDM 69"

Verify on instrument side that TX max power level is about 21-25dBm.

AT#TESTMODE="ESC"

Configure TEST EQUIPMENT/CMD in not signaling mode,

WCDMA VIII and set ARFCN =2787, TXPDM =66:

AT#TESTMODE="TM"

AT#TESTMODE="SETWCDMABAND 8"

AT#TESTMODE="TCH"

AT#TESTMODE="TXPDM 66"

Verify on instrument side that TX max power level is about 21-25dBm.

AT#TESTMODE="ESC"

RX test:

WCDMA: Inject a modulated WCDMA signal to the unit

AT#TESTMODE="TM"

AT#TESTMODE="SETWCDMABAND 8"

AT#TESTMODE="RXON"

AT#TESTMODE="LNA 0"

AT#TESTMODE="RL"

AT#TESTMODE="ESC"

To return to online mode:

AT#TESTMODE="OM"

Verify that module switches to operative mode.

LTE Example:

Configure TEST EQUIPMENT to band LTE I and set EARFCN = 18300, TXGAIN = 68.

Not Subject to NDA

Recommend 4G TX test sequence is below:

Spectrum analyzer setup:

Frequency=1950MHz

RBW=1MHz

Span=100MHz

Manual Attenuation = 30dB

Ref level Offset = depends on a cable loss

Use the trigger video to fix the measurement

Use the peak search marker

AT#TESTMODE="TM"

AT#TESTMODE="SETLTEBAND 1"

AT#TESTMODE="CH 18300"

AT#TESTMODE="TCH"

AT#TESTMODE="TXGAIN 68"

Verify on instrument side that TX max power level is about 20.3 - 25.7dBm.

AT#TESTMODE="ESC"

To return to online mode:

AT#TESTMODE="OM"

Verify that module switches to operative mode.

RX test:

LTE: Inject a modulated LTE signal with RX channel 6300 to the unit.

Recommend 4G TX test sequence is below:

Signal generator setup:

Frequency = 806MHz + 500kHz(offset)

Level = -60dBm

CW is sent (RF on, MOD off)

Offset = depends on a cable loss

AT#TESTMODE="TM"

AT#TESTMODE="SETLTEBAND 20"

AT#TESTMODE="CH 24300"

Not Subject to NDA

AT#TESTMODE="RXON"

AT#TESTMODE="EXP -75"

AT#TESTMODE="RL"

AT#TESTMODE="ESC"

To return to online mode:

AT#TESTMODE="OM"

Verify that module switches to operative mode.

Not Subject to NDA

3.15.31. AT#RXTOGGLE - Swap RX from Main to Diversity

This command swaps the receiver from the main antenna to the diversity antenna.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RXTOGGLE=<TOGGLE_enable>

Parameter:

Name	Type	Default	Description
<TOGGLE_enable>	integer	2	toggle between normal to diversity antenna

Values:

0 : set the RX to the main antenna

1 : set the RX to the diversity antenna

2 : set the RX to both the main and the diversity antennas

Please disable usage of two antennas (**AT#RXDIV=0**) before swapping antennas.

The values set by command are directly stored in NVM.

They are available at next power on.(Solution provider's Limitation.)

AT#RXTOGGLE?

Read command reports the currently selected **<TOGGLE_enable>** in the format:

Not Subject to NDA

#RXTOGGLE: <TOGGLE_enable>

AT#RXTOGGLE=?

Test command reports the supported range of values.

Not Subject to NDA

AT#RXTOGGLE?

#RXTOGGLE: 2 this means that RX is set to both the main and the diversity antennas (Default)

OK

AT#RXDIV?

#RXDIV: 1,1 this means that diversity antenna is already enabled

OK

AT#RXDIV=0,1 this disables the RX Diversity

OK

AT#RXTOGGLE=1 this means that the RX is set to the diversity antenna

OK

AT#RXDIV=1,1 Enable the diversity antenna RX

OK

AT#REBOOT reboot the module

OK

AT+COPS=0 register to the 3G network

OK

AT+CREG=1 enable network registration unsolicited result code

OK

AT+CREG? read <mode> and <stat> parameters

+CREG: 1,1

OK

Not Subject to NDA

3.15.32. AT#CBC - Battery and Charger Status

This command returns the current Battery and Charger state.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CBC

Execution command returns the current Battery and Charger state. The response is in the format:

#CBC: <ChargerState>,<BatteryVoltage>

Additional info:

- The response has its fields described below.

Name	Type	Default	Description
<ChargerState>	integer	0	Battery charger state Values: 0 : charger not connected 1 : charger connected and charging 2 : charger connected and charge completed
<BatteryVoltage>	integer	-	battery voltage in units of 10 mV: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage

Not Subject to NDA

AT#CBC=?

Test command returns the **OK** result code.

Not Subject to NDA

3.15.33. AT#STUNEANT - Set Tunable Antenna Interface

This command set for Tunable Antenna Interface.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#STUNEANT=<enable>[,<band_mask>,<ant1_cfg>[,<ant2_cfg>]]

Set command for Tunable Antenna Interface.

Specific GPIO pin is available on the host interface that can be connected to an external antenna switch.

This command can be used after setting the GPIOs from #GPIO command.

Parameters:

Name	Type	Default	Description
<enable>	integer	0	enables/disables tunable antenna operation and all GPIOs set. Values: 0 : disables (factory default) 1 : enables
<band_mask>	hex	0x00000000	This parameter can be set when **<enable>** parameter is 1. Values: 0x00000000 : No bands allowed 0x00000001 : LTE BAND1 0x00000002 : LTE BAND2 0x00000004 : LTE BAND3

Not Subject to NDA

0x00000008 : LTE BAND4

0x00000010 : LTE BAND5

0x00000020 : LTE BAND7

0x00000040 : LTE BAND8

0x00000080 : LTE BAND9

0x00000100 : LTE BAND12

0x00000200 : LTE BAND13

0x00000400 : LTE BAND14

0x00000800 : LTE BAND18

0x00001000 : LTE BAND19

0x00002000 : LTE BAND20

0x00004000 : LTE BAND25

0x00008000 : LTE BAND26

0x00010000 : LTE BAND28

0x00020000 : LTE BAND66

0x00040000 : LTE BAND71

0x00080000 : WCDMA BAND1

0x00100000 : WCDMA BAND2

0x00200000 : WCDMA BAND3

0x00400000 : WCDMA BAND4

0x00800000 : WCDMA BAND5

0x01000000 : WCDMA BAND6

0x02000000 : WCDMA BAND8

0x04000000 : WCDMA BAND19

Not Subject to NDA

0x08000000 : GSM BAND 850(B5)

0x10000000 : GSM BAND 900(B8)

0x20000000 : GSM BAND 1800(B3)

0x40000000 : GSM BAND1900(B2)

<ant1_cfg>	integer	0	This parameter can be set when **<enable>** parameter is 1. Values: 0 : GPIO is Low (default) 1 : GPIO is High
<ant2_cfg>	integer	0	This parameter can be set when **<enable>** parameter is 1. Values: 0 : GPIO is Low (default) 1 : GPIO is High

Additional info:

▶▶

Signal name	Pin	Description
ant1_cfg	ALT16	Antenna Control 0
ant2_cfg	ALT17	Antenna Control 1

- Tunable antenna pin function of GPIOs correspond to ALT16,17 function of the GPIOs, so it should also set which GPIO will used as ALT16,17 function through AT#GPIO command. Access those GPIOs through AT#GPIO command while Tunable antenna function is enabled is not recommended.
- First, GPIOs what you want to use should set through #GPIO command before #STUNEANT command setting.
In stuneant "enable" state, tunable antenna gpio cannot be set via GPIO command.

Not Subject to NDA

band_mask is supported by LE910Cx series.

1	2	3	4	5	6
LTE 1	LTE 2	LTE 3	LTE 4	LTE 5	LTE 7
7	8	9	10	11	12
LTE 8	LTE 9	LTE 12	LTE 13	LTE 14	LTE 18
13	14	15	16	17	18
LTE19	LTE 20	LTE 25	LTE 26	LTE 28	LTE 66
19	20	21	22	23	24
LTE 71	W1	W2	W3	W4	W5
25	26	27	28	29	30
W6	W8	W19	G850	G900	G1800
31					
G1900					

the setting is saved in NVM.

band mask should be entered in HEX format without "0x".

AT#STUNEANT?

Read command returns the saved value in the format:

#STUNEANT: <enable>

AT#STUNEANT=?

Test command returns the supported range of values of parameters **<enable>,<supported_band_mask>,<ant1_cfg>,<ant2_cfg>**.

Not Subject to NDA

- **Example 1.**

  AT#STUNEANT=?

  #STUNEANT: (0,1),(D6071A),(0,1),(0,1) for LE910C1/C4-NF

  OK

Variant	LTE	WCDMA	GSM	Supported band_mask
LE910Cx-NF	2,4,5,12,13, 14,66,71	2,4,5	Not support	D6071A
LE910Cx-EU	1,3,7,8,20, 28	1,3,8	3,8	32292065
LE910C1-AP	1,3,5,8,28	1,5,8	Not support	A90055
LE910C1-AP(Japan)	1,3,5,8,9,18, 19,26,28	1,5,6,8,19	Not support	78998D5
LE910C1-NA	2,4,12	1,2,4,5,8	2,3,5,8	7AD8010A
LE910Cx-LA	1,2,3,4,5,7, 28	1,2,4,5	2,3,5,8	78D9003F
LE910C1-NS	2,4,5,12,25, 26	Not support	Not support	C11A
LE910C1-SV	4,13	Not support	Not support	208
LE910C1-SA	2,4,12,14,66	Not support	Not support	2050A
LE910C1-ST	2,4,12,66,71	Not support	Not support	6010A
LE910Cx-EUX	1,3,7,8,20, 28	1,3,8	3,8	32292065
LE910C1-SVX	4,13	Not support	Not support	208
LE910C1-SAX	2,4,12,66	Not support	Not support	2010A
LE910Cx-WWX	1,2,3,4,5,7,8,9, 12,13,14,18,19, 20,25,26,28	1,2,4,5,6,8,19	2,3,5,8	7FD9FFFF

*GSM 850(B5), GSM 900(B8), GSM 1800(B3), GSM 1900(B2)

- **Example 2.**

Not Subject to NDA

AT#GPIO=2,0,17 -> Setting the ALT16 for GPIO2.

AT#STUNEANT=1 -> All supported band set GPIO2 high.

AT#STUNEANT?

#STUNEANT: 1

AT#GTUNEANT?

#GTUNEANT: 1,D6071A

AT#GPIO=2,0,0 -> Clear the Alternate GPIO setting.

AT#STUNEANT=0 -> Disable the STUNEANT setting.

AT#STUNEANT?

#STUNEANT: 0

AT#GTUNEANT?

ERROR

1. Gpio used and supported band is LTE: 2,4,5,12,13,14,66,71 WCDMA: 2,4,5, so All mask value is D6071A for LE910Cx-NF.

AT#GPIO=2,0,17 -> Setting the ALT16 for GPIO2.

AT#STUNEANT=1,2,1 -> LTE BAND2 set GPIO2 high.

#GTUNEANT:2,1

#GTUNEANT: D60718,0 -> All bands except LTE BAND2 set GPIO2 low.

(LTE 4,5,12,13,14,66,71 / WCDMA:2,4,5)

Case of change the other gpio pin.

AT#STUNEANT=0

AT#GPIO=3,0,18-> Setting the ALT17 for GPIO3.

AT#STUNEANT=1,2,1->LTE BAND2 set the GPIO3 high.

AT#GTUNEANT?

#GTUNEANT: 2,1

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#GTUNEANT: D60718,0 ->All bands except LTE BAND2 set the GPIO3 low.

(LTE 4,5,12,13,14,66,71 / WCDMA:2,4,5)

2. Gpio used and supported band is lte:2,4,5,12,13,14,66,71 wcdma:2,4,5, so All mask value is D6071A for LE910Cx-NF

AT#GPIO=2,0,17->Setting the ALT16 for GPIO2.

AT#GPIO=3,0,18->Setting the ALT17 for GPIO3.

AT#STUNEANT=1,2,1,1 -> LTE BAND2 set gpios.

AT#STUNEANT=1,8,1,0 -> LTE BAND4 set gpios.

AT#STUNEANT=1,10,0,1 -> LTE BAND5 set gpios.

AT#STUNEANT=1,D60700,0,0 -> (LTE 12,13,14,66,71 / WCDMA 2,4,5)

#GTUNEANT: 2,1,1

#GTUNEANT: 8,1,0

#GTUNEANT: 10,0,1

#GTUNEANT: D60700,0,0

Not Subject to NDA

3.15.34. AT#SKIPGCF - SKIPGCF mode enable / disable for thermal test

This command allows to set for skip the GCF mode when thermal test with Call-box and GCF SIM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SKIPGCF=<mode>

Set command enables/disables to skip GCF mode for thermal test with Call-box and GCF SIM.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable the skip GCF mode Values: 0 : Disable the skip GCF mode. (Factory Default) 1 : Enable the skip GCF mode.

Qualcomm described that Thermal management is active only when using a non-GCF SIM, i.e., a SIM that is not programmed with MCC-MNC(1-1).

The values set by command stored in NVM and this value be applied after rebooting the modem.

After setting the #SKIPGCF=1, Need UE twice reboot for thermal algorithm proper operation with GCF programmed SIM.

AT#SKIPGCF?

Not Subject to NDA

Read command reports the current stored parameter:

#SKIPGCF: <mode>

AT#SKIPGCF=?

Test command returns the supported range of value for parameter **<mode>**.

Not Subject to NDA

3.16. Mobile Broadband

3.16.1. Ethernet Control Mode (ECM)

3.16.1.1. AT#ECM - Ethernet Control Model Setup

This command sets up an Ethernet Control Model (ECM) session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ECM=<Cid>,<Did>

This command sets up an Ethernet Control Model (ECM) session.

Parameters:

Name	Type	Default	Description
<Cid>	integer	-	context id that will be used by ECM. Refer to test command to know the supported range of values
<Did>	integer	-	device id, currently limited to 0 (only one device)

Additional info:

- This command only works in ECM Mode.

- This command activates a context, so all necessary setup has to be done before it (registration, APN).

- If target PDP is not connected to WWAN , return ERROR

Not Subject to NDA

- If a PDP context is already established , return OK
- If user configuration is not in proper format, return ERROR
  - ex) ip: 192.168.225.2 , nm: 255.255.255.0 gw: 1.1.111.1
- If user try to set different network configuration comparing to current one using AT#ECMC first. Then upon executing #ECM command, the UART console will be disconnected as USB driver will be reloaded to make host device broadcast DHCP.
- For LE910C1-EUX, to enable the ECM session configuration the module must be rebooted.

AT#ECM?

Read command returns the session state in the following format:

 # ECM: <Did>,<State>
OK

Additional info:

- Here are the parameters meaning returned by the read command and not described in the previous sections.

Name	Type	Default	Description
<Did>	integer	-	Device id (only 0 is valid)
<State>	integer	0	ECM session status Values: 0 : disabled 1 : enabled

Not Subject to NDA

AT#ECM=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.16.1.2. AT#ECMC - ECM Configure

The command manages the Ethernet control Model session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ECMC=<DId>,<parId>,<par>

This command configures an Ethernet Control Model (ECM) session.

Parameters:

Name	Type	Default	Description
<DId>	integer	0	device id. Value: 0 : currently there is just one valid value
<parId>	integer	N/A	parameter id Values: 0 : custom address 1 : custom mask 2 : custom gateway 3 : custom dns 1 4 : custom dns 2 5 : device name
<par>	string	-	a valid parameter value

Additional info:

Not Subject to NDA

- This command only works in ECM mode.

- The parameters should be surrounded by quotes ex) "192.168.168.1" and the value should be in proper format.
- Validation of relationship between ip, netmask and gateway is not checked when you set. it'll be checked when you execute AT#ECM command.
- Provide a valid device name, otherwise the results could be not right.
- If the User set Custom Address only and do not set device name, then ERROR would be returned.

AT#ECMC?

Read command returns the last session configuration in the following format:

#ECMC:
<Did>,<State>,<Address>,<Address_Mask>,<Address_Gateway>,<Address_Dns1>,<Address_Dns2>,<Address_Custom>,<Address_CustomMask>,<Address_CustomGateway>,<Address_CustomDns1>,<Address_CustomDns2>,<Mac_Address>,<Device_Name>

...

OK

Additional info:

- Parameters returned by the Read command and not described in the previous sections.

Name	Type	Default	Description
<Did>	integer	0	device id

Not Subject to NDA

	Value: 0 : currently 0		
<State>	integer	N/A	State of ECM session. Values: 0 : disabled 1 : enabled
<Current_Address>	string	-	Current IP Address
<Current_Address_Mask>	string	-	Current Net Mask
<Current_Address_Gateway>	string	-	Current address gateway
<Current_Address_Dns1>	string	-	Current Primary DNS
<Current_Address_Dns2>	string	-	Current secondary DNS
<Address_Custom>	string	-	User IP Address
<Address_CustomMask>	string	-	User IP Net Mask
<Address_CustomGateway>	string	-	User IP Gateway
<Address_CustomDns1>	string	-	User Primary DNS
<Current_Address_Dns2>	string	-	Current secondary DNS
<Device_Name>	string	-	Valid Device Name

⚠ **"USER Setting"** values will be adopted when you execute AT#ECM command.

⚠ In case of CURRENT Settings, void string will be shown if the value is not set, for example: If there's no DNS value , then "CURRENT PRIMARY DNS" will be " "

Not Subject to NDA

⚠ In case of USER Settings. if user doesn't set target value, then void string will be displayed.

⚠ if current netmask is "255.255.255.0", and you set only "USER IP" address without setting "USER NETMASK", then netmask will become "255.255.255.0", and will be used in #ECM as well.

?(AT#ECMC=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.16.1.3. AT#ECMD - ECM Shutdown

This command is used to shutdown an Ethernet Control Model (ECM) session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ECMD=<Did>

Set command to shutdown an Ethernet Control Model (ECM) session.

Parameter:

Name	Type	Default	Description
<Did>	integer	N/A	Device id, currently limited to 0 (only one device) Value: 0 : Device id (currently limited to only one device)

NOTE: this command also deactivates the context.

NOTE: If ECM backhaul is not connected yet, Returns OK

NOTE: LE910C1-EUX, to make active the command the module must be rebooted.

AT#ECMD?

Read command returns the session state in the following format:

#ECM: <Did>,<State>
OK

Additional info:

Not Subject to NDA

▶▶ Parameter returned by the read command and not described in the previous sections.

Name	Type	Default	Description
<Did>	integer	-	Device id, currently limited to 0 (only one device)
<State>	integer	0	ECM Backhaul connection status Values: 0 : disabled 1 : enable

AT#ECMD=?

Test command returns the range of supported values for <**Did**>.

Not Subject to NDA

3.16.1.4. AT#RNDIS - Remote Network Driver Interface Specification setup

This command sets up Remote Network Driver Interface Specification(RNDIS) session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#RNDIS=<Cid>,<Did>

This command sets up a Remote Network Driver Interface Specification (RNDIS) session.

Parameters:

Name	Type	Default	Description
<Cid>	integer	-	Valid PDP ID
<Did>	integer	-	Device id, currently limited to 0(only one device)

- This command activates a PDP context, so all necessary setup has to be done before it (registration, APN).
- If target PDP is not connected to WWAN , return ERROR
- If a PDP context is already established , return OK
- If user configuration is not in proper format, return ERROR
  - ex) ip: 192.168.225.2 , nm: 255.255.255.0 gw: 1.1.111.1
- If user try to set different network configuration comparing to current one using AT#RNDISC first. Then upon executing #RNDIS command, the UART console will be disconnected as USB driver will be reloaded to make host device broadcast DHCP.

Not Subject to NDA

AT#RNDIS?

Read command returns the session state in the following format:

Additional info:

#RNDIS: <Did>,<State>

...

OK

Name	Type	Default	Description
<Did>	integer	0	device id Value: 0 : device id
<State>	integer	0	RNDIS backhaul connection status Values: 0 : disabled 1 : enabled

AT#RNDIS=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.16.1.5. AT#RNDISC - Remote Network Driver Interface Specification configure

This command configures Remote Network Driver Interface Specification (RNDIS) session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RNDISC=<Did>,<Parid>,<Par>

This command configures Remote Network Driver Interface Specification (RNDIS) session.

Parameters:

Name	Type	Default	Description
<Did>	integer	-	Device id, currently limited to 0 (only one device)
<Parid>	integer	N/A	Parameter id Values: 0 : customer address 1 : custom mask 2 : custom gateway 3 : custom dns 1 4 : custom dns 2 5 : device name
<Par>	string	-	a valid parameter in proper format or range

Additional info:

- This command only works in RNDIS mode.

Not Subject to NDA

- Network address should be surrounded by quotes ex) "192.168.168.1" and the value should be in proper format.
- Validation of relationship between ip, netmask and gateway is not checked when you set. it'll be checked when you execute AT#RNDIS command.
- Provide a valid device name, otherwise the results could be not right.
- If the User set Customer Address only and do not set device name, then ERROR would be returned.
- This command can only configure IPv4.

AT#RNDISC?

Read command returns the last session configuration in the following format:

Additional info:

#RNDISC:
<Did>,<State>,<Current_Address>,<Current_Address_Mask>,<Current_Address_Gateway>,<Current_Address_Dns1>,<Current_Address_Dns2>,<Address_Custom>,<Address_CustomMask>,<Address_CustomGateway>,<Address_CustomDns1>,<Address_CustomDns2>, <Device_Name>

...

OK

Name	Type	Default	Description
<Did>	integer Value:	0	Device id

Not Subject to NDA

	0 : device id		
<State>	integer	N/A	RNDIS Session Status Values: 0 : disabled 1 : enabled
<Current_Address>	string	-	Current IP Address
<Current_Address_Mask>	string	-	Current Net Mask
<Current_Address_Gateway>	string	-	Current address gateway
<Current_Address_Dns1>	string	-	Current Primary DNS
<Current_Address_Dns2>	string	-	Current secondary DNS
<Address_Custom>	string	-	User IP Address
<Address_CustomMask>	string	-	User IP Net Mask
<Address_CustomGateway>	string	-	User IP Gateway
<Address_CustomDns1>	string	-	User Primary DNS
<Address_CustomDns2>	string	-	User Secondary DNS
<Device_Name>	string	-	Valid Device Name

"USER Setting" values will be adopted when you execute AT#RNDIS command.

In case of CURRENT Settings, void string will be shown if the value is not set, for example: If there's no DNS value , then "CURRENT PRIMARY DNS" will be " "

In case of USER Settings. if user doesn't set target value, then void string will be displayed.

Not Subject to NDA

if current netmask is "255.255.255.0", and you set only "USER IP" address without setting "USER NETMASK", then netmask will become "255.255.255.0", and will be used in #RNDIS as well.

AT#RNDISC=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.16.1.6. AT#RNDISD - Remote Network Driver Interface Specification shutdown

This command is used to shutdown a Remote Network Driver Interface Specification (RNDIS) session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#RNDISD=<Did>

This command is used to shutdown a Remote Network Driver Interface Specification (RNDIS) session.

Parameter:

Name	Type	Default	Description
<Did>	integer	-	Device id, currently limited to 0 (only one device)

This command also deactivates the PDP context.

If backhaul is not connected yet, Returns OK

AT#RNDISD?

Read command returns the session state in the following format:

Additional info:

#RNDISD: <Did>,<State>

...

OK

Name	Type	Default	Description

Not Subject to NDA

<Did>	integer	-	Device id, currently limited to 0 (only one device)
<State>	integer	0	RNDIS backhaul connection status Values: 0 : disabled 1 : enabled

AT#RNDISD=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.17. IPEasy

3.17.1. AT#SGACT - PDP Context Activation

This command enables/disables the PDP context activation.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SGACT=<cid>,<stat>[,<userId>,<pwd>]

Execution command is used to activate the specified PDP context, followed by binding data application to the PS network. Also, it is used to deactivate the PDP context and unbind data application from PS network.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	PDP context identifier numeric parameter which specifies a particular PDP context definition The value of max is returned by the Test command. Value: 1÷max : specifies a particular PDP context definition (see +CGDCONT command)
<stat>	integer	N/A	activate/deactivate the PDP context specified Values:

Not Subject to NDA

	0 : deactivate the context 1 : activate the context		
<userId>	string	-	user identifier, used only if the context requires it
<pwd>	string	-	password, used only if the context requires it

Additional info:

- Execution command returns a list of IP addresses for the specified context identifiers in the format:

  If IP or IPV6 PDP context:

  #SGACT: <ipAddr>

  For DUAL STACK IPV4V6 PDP context:

  #SGACT: [<ipAddrV4>],[<ipAddrV6>]

Name	Type	Default	Description
<ipAddr>	string	-	ip address ipv4 or ipv6
<ipAddrV4>	string	-	ip address ipv4(if v4 PDP context activated)
<ipAddrV6>	string	-	ip address ipv6(if v6 PDP context activated)

context activation/deactivation returns ERROR if there is not any socket associated to it (see **AT#SCFG**).

In LTE network, default PDP context (cid 1) is activated by piggybacking on LTE attach procedure and maintained until detached from NW. This command with cid 1 is just binding or unbinding application to the default PDP context.

Not Subject to NDA

If the unsolicited result code for obtaining IP address was enabled (urcmode value) using **#SGACTCFG** command, on start-up and due to USB enumeration timing the unsolicited may not appear, user should manually use **+CGPADDR** command to see the IP address.

PDP authentication is changed by **#SGACTAUTH** and **#USERID** and **#PASSW** when activate using **#SGACT** And it's synchronizes with the **#PDPAUTH**. and you can't sync when you're deactivate.

PDP context deactivation returns an ERROR if the socket session of applications such as Socket, FTP and etc is active.

LwM2M client tries to connect server with using CID=4 PDN by default according to the ATT requirement(attm2mglbal). But if CID=4 cannot be connected, LwM2M client uses CID=1. In that case,There is problem that cannot use the data connection by #SGACT=1,1. At that time, it need to use the AT#LWM2MSkIP command or check if SIM card supports LwM2Mglobal service.

AT#SGACT?

Returns the state of all the five contexts, in the format:

#SGACT: <cid1>,<Stat1><CR><LF>

...

#SGACT: <cid max>,<Stat max>

Additional info:

parameters meaning.

Name	Type	Default	Description
<cidn>	integer	-	as **<cid>** in Set section
<statn>	integer	N/A	context status

Not Subject to NDA

Values:

0 : context deactivated

1 : context activated

AT#SGACT=?

Reports the range for the parameters **<cid>** and **<stat>.**

Not Subject to NDA

3.17.2. AT#SGACTCFG - PDP Automatic Context Activation-Reactivation

This command configures the automatic activation/reactivation of the specified PDP context

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SGACTCFG=<cid>,<retry>,[,<delay>[,<urcmode>]]

Set command is used to enable or disable the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every GPRS Attach or after a NW PDP CONTEXT deactivation if at least one IPEasy socket is configured to this context (sees **AT#SCFG**).

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	numeric parameter which specifies a particular PDP context definition The value of max is returned by the Test command.
	Value: 1÷max : specifies a particular PDP context definition		
<retry>	integer	0	specifies the maximum number of context activation attempts in case of activation failure
	Values: 0 : disable the automatic activation/reactivation of the context 1÷15 : supported range		

Not Subject to NDA

<delay>	integer	N/A	specifies the delay in seconds between an attempt and the next one
	Value:		
	180÷3600 : supported range		
<urcmode>	integer	0	URC presentation mode.
	Values:		
	0 : disable unsolicited result code		
	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		

Additional info:

- The unsolicited message is in the format:

  If IP or IPV6 PDP context:

  #SGACT: <ip_address>

  For DUAL STACK IPV4V6 PDP context:

  #SGACT: [<ipAddrV4>],[<ipAddrV6>]

  Reporting the local IP address obtained from the network.

- 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.

- **<retry>** and **<delay>** setting is global parameter saved in NVM

Not Subject to NDA

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: <cid max>,<retry5>,<delay5>,< urcmode >

Additional info:

parameters meaning.

Name	Type	Default	Description
<cidn>	integer	-	PDP context identifier
<retryn>	integer	-	specifies the maximum number of context activation attempts in case of activation failure
<delayn>	integer	-	specifies the delay in seconds between an attempt and the next one
<urcmode>	integer	-	URC presentation mode

AT#SGACTCFG=?

Test command reports supported range of values for parameters **<cid>**, **<retry>**, **<delay>** and **< urcmode >**.

Not Subject to NDA

Not Subject to NDA

3.17.3. AT#SGACTCFGEXT - Extended PDP Context Configuration

This command manages the extended configuration of context activation.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SGACTCFGEXT=<cid>,<abortAttemptEnable>[,<unused>[,<unused>[,<unused>]]]

Set command is used to enable new features related to context activation.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	PDP context identifier (see +CGDCONT command) numeric parameter which specifies a particular PDP context definition The value of max is returned by the Test command Value: 1÷max : supported range
<abortAttemptEnable>	integer	N/A	enables/disables abort during context activation attempt Values: 0 : old behavior: no abort possible while attempting context activation 1 : abort during context activation attempt is possible by sending a byte on the serial port

Not Subject to NDA

<unused>	mixed	-	unused parameter
<unused>	mixed	-	unused parameter
<unused>	mixed	-	unused parameter

Additional info:

- 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).

- 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).

- the command is not effective while the context is already open.

AT#SGACTCFGEXT?

Read command reports the state of all the five contexts, in the format:

#SGACTCFGEXT: <cid1>,< abortAttemptEnable1 >,0,0,0<CR><LF>

...

#SGACTCFGEXT: <cid max>,< abortAttemptEnable5 >,0,0,0<CR><LF>

Additional info:

Not Subject to NDA

parameters meaning.

Name	Type	Default	Description
<cidn>	integer	-	as <cid> in Set section
<abortAttemptEnableN>	integer	-	as <abortAttemptEnable> in Set section

AT#SGACTCFGEXT=?

Test command reports supported range of values for all parameters.

Not Subject to NDA

3.17.4. AT#GPRS - GPRS Context Activation

This command deactivate or activate authentication process

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	Yes	-	2

AT#GPRS=[<mode>]

Execution command deactivates/activates the GPRS context, eventually proceeding with the authentication with the parameters given with #PASSW and #USERID.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	GPRS context activation mode Values: 0 : GPRS context deactivation request 1 : GPRS context activation request

Additional info:

- In the case that the PDP context #1 has been activated, the result code:if IPV4 or IPV6 PDP context:

  +IP: <ip_address_obtained>

  OK

  For DUAL STACK IPV4V6 PDP context#1

  +IP: [<ipAddrV4>],[<ipAddrV6]

Name	Type	Default	Description

Not Subject to NDA

<ipAddrV4>	string	-	ip address ipv4(if v4 PDP context activated)
<ipAddrV6>	string	-	ip address ipv6(if v6 PDP context activated)

This command is valid only for *Context* 1.

In case of Verizon, This command is valid only for Context 3.

It is strongly recommended to use the same command (e.g. **#GPRS**) to activate the context, deactivate it and interrogate about its status.

AT#GPRS?

Read command reports the current status of the GPRS context, in the format:

#GPRS: <status>

Additional info:

parameter meaning,

Name	Type	Default	Description
<status>	integer	N/A	status of PDP context
	Values:		
	0 : GPRS context deactivated		
	1 : GPRS context activated		

Not Subject to NDA

AT#GPRS=?

Test command returns the allowed values for parameter **<mode>**.

- AT#GPRS=1

  #GPRS: 129.137.1.1

  OK

  Now GPRS Context has been activated and our IP is 129.137.1.1

  AT#GPRS=0

  OK

  Now GPRS context deactivated, IP is lost.

Not Subject to NDA

3.17.5. AT#CGPADDR - Show PDP Address

This command returns a list of PDP addresses for the specified context identifiers.

3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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>[...]]

Parameter:

Name	Type	Default	Description
<cid>	integer	N/A	specifies a particular PDP context definition (see **+CGDCONT** command). If no **<cid>** specified, the addresses for all defined contexts are returned. Value: 1÷max : the value of max is returned by the Test command

Additional info:

- parameter meaning,

Name	Type	Default	Description

Not Subject to NDA

<cid>	integer	N/A	specifies a particular PDP context definition (see **+CGDCONT** command). If no **<cid>** specified, the addresses for all defined contexts are returned. Value: 1÷5 : supported range
<PDP_addr>	string	-	identifies the terminal in an address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the **+CGDCONT** command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**;**<PDP_addr>** is omitted if none is available

AT#CGPADDR=?

Test command returns a list of defined <**cid**>s.

Not Subject to NDA

```
AT#GPRS=1
#GPRS: xxx.yyy.zzz.www

OK

AT#CGPADDR=1
#CGPADDR: 1,"xxx.yyy.zzz.www"

OK

AT#CGPADDR=?
#CGPADDR: (1)

OK

AT#CGPADDR =
#CGPADDR: 1,"10.76.2.254"
#CGPADDR: 2,""
#CGPADDR: 3,""

 OK
```


Not Subject to NDA

3.17.6. AT#SCFG - Socket Configuration

The command sets the configuration for the socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>

Set command sets the socket configuration parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier Value: 1÷conMax : supported range (conMax value is returned by test command)
<cid>	integer	N/A	PDP context identifier numeric parameter which specifies a particular PDP context definition The value of max is returned by the Test command. Value: 1÷max : specifies a particular PDP context definition
<pktSz>	integer	300	packet size to be used by the TCP/UDP/IP stack for data sending. Used for online data mode only Values: 0 : automatically chosen by the device 1÷1500 : packet size in bytes

Not Subject to NDA

<maxTo>	integer	90	exchange timeout (or socket inactivity time); if there's no data exchange within this timeout period the connection is closed Values: 0 : no timeout 1÷65535 : timeout value in seconds
<connTo>	integer	600	connection timeout; if we can't establish a connection to the remote within this timeout period, an error is raised. Value: 10÷1200 : timeout value in hundreds of milliseconds
<txTo>	integer	50	data sending timeout; data are sent even if they're less than max packet size, after this period. Used for online data mode only Values: 0 : no timeout 1÷255 : timeout value in hundreds of milliseconds 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

Not Subject to NDA

264 : set timeout value in 90 milliseconds

these values are automatically saved in NVM

AT#SCFG?

Read command returns the current socket configuration parameters values for all the six sockets, in the format:

#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1><CR><LF>

...

#SCFG: <connIdconMax>,<cidconMax>,<pktszconMax>,<maxToconMax>,<connToconMax>,<txToconMax><CR><LF>

AT#SCFG=?

Test command returns the range of supported values for all the sub parameters.

- 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

Not Subject to NDA

3.17.7. AT#SCFGEXT - Socket Configuration Extended

This command sets the socket configuration extended parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SCFGEXT=<connId>,<srMode>,<recvDataMode>,<keepalive>[,<ListenAutoRsp> [,<sendDataMode>]]

Set command sets the socket configuration extended parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	1	socket connection identifier
	Value:		
	1÷conMax :		socket connection identifier. conMax value is returned by test command
<srMode>	integer	0	SRING unsolicited mode, see Additional info section.
	Values:		
	0 :		Normal
	1 :		Data amount
	2 :		Data view
	3 :		Data view with UDP datagram information
<recvDataMode>	integer	0	Data view mode for received data in command mode (**#SRECV** or **<srMode>** = 2)
	Values:		

Not Subject to NDA

0 : Text mode

1 : Hexadecimal mode

<keepalive>	integer	0	Set the TCP Keepalive value in minutes

Values:

0 : deactivated

1÷240 : keepalive time in minutes

<ListenAutoRsp>	integer	0	set the listen auto-response mode, that affects the commands **#SL** and **#SLUDP**

Values:

0 : deactivated

1 : activated

<sendDataMode>	integer	0	Data mode for sending data in command mode (**#SSEND**)

Values:

0 : data represented as text

1 : 0ata represented as sequence of hexadecimal numbers (from 00 to FF). Each octet of the data is given as two IRA character long.

Additional info:

▶▶ These are the **SRING** formats, depending on <**srMode**> setting:

if <**srMode**> = 0 (Normal):

SRING: <connId>

Not Subject to NDA

if <srMode> = 1 (Data amount):

SRING: <connId>,<recData>

if <srMode> = 2 (Data view):

SRING: <connId>,<recData>,<data>

if <srMode> = 3 (Data view with UDP datagram information):

SRING: <sourceIP>,<sourcePort>,<connId>,<recData>,<dataLeft>,<data>

Name	Type	Default	Description
<recData>	integer	-	amount of data received on the socket connection number <connId>
<data>	mixed	-	data received displayed following <recvDataMode> value
<sourceIP>	string	-	IP address of the source of data
<sourcePort>	string	-	IP port of the source of data
<dataLeft>	integer	-	number of bytes left in the UDP datagram

Keepalive is available only on TCP connections.

For the behavior of #SL and #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:

Not Subject to NDA

#SCFGEXT: <connId$_1$>,
<srMode>,<dataMode>,<keepalive>,<ListenAutoRsp>,0<CR><LF>

. . .

#SCFGEXT:<connId$_{conMax}$>,<srMode>,<dataMode>,<keepalive>,
<ListenAutoRsp>,0<CR><LF>

AT#SCFGEXT=?

Test command returns the range of supported values for all the sub parameters.

- 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
...
...
OK
```


Not Subject to NDA

3.17.8. AT#SCFGEXT2 - Socket Configuration Extended 2

Socket Configuration Extended.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

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:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier Value: 1÷conMax : socket connection identifier value (conMax value is returned by the Test command)
<bufferStart>	integer	0	select one of the two data sending timeout methods, the first one defined "old" the second one "new". The "old" data sending timeout method is set - by default - by **#SCFG** command, which sets also the **<txTo>** data sending timeout value. With **#SCFGETXT2** command, you can set either the "old" or the "new" data sending timeout method. If the "new" method is selected, the "old" one is automatically disabled.

Not Subject to NDA

			The checking 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. Values: 0 : select "old" method: start transmission timer only first time if new data are received from the serial port 1 : select "new" method: restart transmission timer when new data is received from serial port
<abortConnAttempt>	integer	0	enable the abort of an ongoing connection attempt started by **#SD** command and before the reception of the **CONNECT** message (in online mode) or **OK** message (in command mode). Values automatically saved in NVM. Values: 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 given to the AT interface, the ERROR message will be received on the interface itself.
<unused_B>	integer	-	reserved for future use

Not Subject to NDA

<unused_C>	integer	-	reserved for future use
<noCarrierMode>	integer	0	select the **NO CARRIER** message format received when the socket is closed. Values: 0 : no additional information is attached to NO CARRIER message 1 : NO CARRIER: <connId> message 2 : NO CARRIER: <connId>, <cause> message. Refer to Additional info section

Additional info:

▶▶ <**noCarrierMode**>=2 selects the following **NO CARRIER** message format:

NO CARRIER: <connId>, <cause>

Name	Type	Default	Description
<cause>	integer	-	is the socket disconnection cause. Refer to **#SLASTCLOSURE** command to know its values and meanings.

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.

Check if new data have been received from serial port is done with a granularity directly related to <**txTo**> parameter which is set by **#SCFG** command. The maximum period is 1 sec.

Like **#SLASTCLOSURE**, in case of subsequent consecutive closure causes received, the original disconnection cause indicated.

Not Subject to NDA

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 of the six sockets. The format is:

#SCFGEXT2:<connId$_1$>,<bufferStart$_1$>,<abortConnAttempt$_1$>,0,0,<noCarrierMode$_1$>
<CR><LF>
. . .
#SCFGEXT2:<connId$_{conMax}$>,<bufferStar$_{conMax}$>,<abortConnAttempt$_{conMax}$>0,0,<noCarrierMode$_{conMax}$><CR><LF>

AT#SCFGEXT2=?

Test command returns the range of supported values for all parameters.

- Set the new transmission timer behavior for <**connId**>=1 and <**connId**>=2 sockets.

  AT#SCFGEXT2=1,1
  OK

  AT#SCFGEXT2=2,1
  OK

  Change the <**txTo**> data sending timeout of the <**connId**>=1 socket.

  AT#SCFG=1,1,300,90,600,30
  OK

Not Subject to NDA

3.17.9. AT#SCFGEXT3 - Socket Configuration Extended 3

This command sets the socket configuration extended parameters for features not included in **#SCFGEXT** command nor in **#SCFGEXT2** command.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SCFGEXT3=<connId>,<immRsp>[,<closureTypeCmdModeEnabling>[,<fastsring>,<lingerTime>[,<UDPSocketMode>[,<ssendTimeout>]]]]

Set command sets the socket configuration extended parameters for features not included in **#SCFGEXT** command nor in **#SCFGEXT2** command.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier Value: 1÷conMax : supported range (conMax value is returned by test command)
<immRsp>	integer	0	Enables **AT#SD** command mode immediate response Values: 0 : 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

Not Subject to NDA

			immediately. Then the state of the connection can be read by the AT command AT#SS
<closureTypeCmdModeEnabling>	integer	0	It has no effect and is included only for backward compatibility Values: 0 : disabled 1 : enabled
<fastsring>	integer	0	It has no effect and is included only for backward compatibility Values: 0 : disabled 1 : enabled
<lingerTime>	integer	1	Defines the time (in seconds) that the connection will not return until all queued messages for the socket have been successfully sent or the linger timeout has been reached. Values: 1 : minimum

Not Subject to NDA

			120 : maximum seconds (equals to 2 minutes)
<UDPSocketMode>	mixed	1	Defines the socket mode of operation WRT the remote socket Values: 1 : DL will accept any remote IP and PORT, UL for specified IP and port only. 2 : DL will accept any remote IP and PORT, UL changes the remote IP and PORT to the last used (received/ sent) IP and port. 3 : Connected mode, DL and UL for specified IP and port only.
<ssendTimeout>	integer	0	Timeout for #SSEND Values: 0 : no timeout 1 : immediate exit (error) in case of stack temporary suspended internally 100÷600 : timeout value in hundreds of milliseconds

Not Subject to NDA

parameter is saved in NVM

AT#SCFGEXT3?

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

#SCFGEXT3: <connId1>, <immRsp1>, <closureTypeCmdModeEnabling1>, <fastsring1>, <lingerTime1>,<UDPSocketMode1>,<ssendTimeout1><CR><LF>

...

#SCFGEXT3: <connIdconMax>, <immRspconMax>, <closureTypeCmdModeEnablingconMax>, <fastsringconMax>, <lingerTimeconMax>,<UDPSocketModeconMax>,<ssendTimeoutconMax><CR><LF>

AT#SCFGEXT3=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

3.17.10. AT#SKTRST - Socket Parameters Reset

Socket Parameters Reset

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SKTRST

Execution command resets the actual socket parameters in the NVM of the device to the default ones.

The socket parameters to reset are:

- User ID
- Password
- Packet Size
- Socket Inactivity Time-Out
- Data Sending Time-Out
- Socket Type
- Remote Port
- Remote Address
- TCP Connection Time-Out

AT#SKTRST=?

Test command returns the **OK** result code.

- AT#SKTRST

  OK

  socket parameters have been reset

Not Subject to NDA

3.17.11. AT#SD - Socket Dial

This command opens a remote connection via socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>[,<closureType>[,<lPort>[,<connMode>[,<txTime>[,<userIpType>]]]]]

Execution command opens a remote connection via socket.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier Value: 1÷conMax : supported range (conMax value is returned by test command)
<txProt>	integer	N/A	Transmission protocol. Values: 0 : TCP 1 : UDP
<rPort>	integer	N/A	Remote host port to contact. Value: 1÷65535 : remote host port number
<IPaddr>	string	-	IP address of the remote host: - any valid IP address in the format: "xxx.xxx.xxx.xxx"

Not Subject to NDA

			- any host name to be solved with a DNS query - any valid IPv6 address in the format: xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx or xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx. xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx
<closureType>	integer	0	socket closure behaviour for TCP Values: 0 : local host closes immediately when remote host has closed 255 : local host closes after an escape sequence (+++) 254 : Receive indication that remote sent FIN/RST during reading the buffer
<lPort>	integer	N/A	UDP connections local port Value: 1÷65535 : UDP local port number
<connMode>	integer	0	Connection mode. Values: 0 : online mode connection 1 : command mode connection
<txTime>	integer	0	adjusting a time interval for series of UDP data packets will be uploaded. Values: 0 : Time interval is not requested 1÷1000 : Time interval in milliseconds

Not Subject to NDA

<userIpType>	integer	0	ip type for socket to open Values: 0 : no ip type chosen 1 : ipv4 2 : ipv6

- **<userSockType>** this parameter only valid when <ipaddr> is domain name and dual stack connection is open by (#SGACT).
- **when <userSockType> is "no ip type chosen"** ipv6 will be requested firstly. When ipv6 DNS server doesn't support so ipv4 will be requested.
- **<closureType>** parameter is valid for TCP connections only and has no effect (if used) for UDP connections.
- **<lPort>** parameter is valid for UDP connections only and has no effect (if used) for TCP connections.
- 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>**.
- 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**.
- if there are input data arrived through a connected socket and not yet read because the module entered **command mode** before reading them (after an escape sequence or after **#SD** has been issued with **<connMode>** set to

Not Subject to NDA

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**.

<txTime> parameter is valid for UDP connections only and has no effect (if used) for TCP connections. For slow servers it is recommended to adjust the time interval for uploading series of data packets in order to do not lose data. The following data packet will be sent after the previous data packet's time interval has been expired.

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 open additional **online mode connection** only after suspending the first socket connection (socket stays open) using the escape sequence (**+++**).

To check the indication of the FIN/RST received use the command AT#SI.

AT#SD=?

Test command reports the range of values for all the parameters.

- *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
```


Not Subject to NDA

3.17.12. AT#SH - Socket Shutdown

The set command closes a socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SH=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier to be closed

Value:

1÷conMax : socket connection identifier. conMax value is returned by test command

Socket cannot be closed in states "resolving DNS" and "connecting", see **#SS** command.

AT#SH=?

Test command reports the range for parameter <**connId**>

Not Subject to NDA

3.17.13. AT#SL - Socket Listen

The command opens/closes socket listening.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SL=<connId>,<listenState>,<listenPort>[,<lingerT>]

Set command opens/closes a socket listening for an incoming TCP connection on a specified port.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier Value: 1÷6 : socket connection identifier
<listenState>	integer	N/A	listening action Values: 0 : close socket listening 1 : start socket listening
<listenPort>	integer	N/A	local listening port Value: 1÷65535 : local listening port value
<lingerT>	integer	N/A	linger time Values: 0 : immediate closure after remote closure

Not Subject to NDA

255	:	local host closes only after an escape sequence (+++)

If successful, command returns a final result code **OK**. If the ListenAutoRsp flag has not been set through the command **#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 **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**.

If the socket is closed by the network the following URC is received:

#SKTL: ABORTED

AT#SL?

Read command returns all the actual listening TCP sockets.

AT#SL=?

Test command returns the range of supported values of the parameters.

Not Subject to NDA

Open a socket listening for TCP on port 3500.

```
AT#SL=1,1,3500
OK
```


Not Subject to NDA

3.17.14. AT#SA - Socket Accept

Execution command accepts an incoming socket connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SA=<connId>[,<connMode>]

Execution command accepts an incoming socket connection after an URC

SRING: <connId>

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier. Value: 1÷max : Socket connection identifier value (max is returned by the Test command)
<connMode>	integer	0	Connection mode, as for command **#SD**. Values: 0 : online mode connection 1 : command mode connection

The **SRING** URC has to be a consequence of a **#SL** issue.

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.

Not Subject to NDA

AT#SA=?

Test command reports the range of values for all the parameters.

Not Subject to NDA

3.17.15. AT#SLUDP - Socket Listen UDP

This command opens/closes a socket listening for an incoming UDP connection on a specified port.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT#SLUDP=<connId>,<listenState>,<listenPort>

Execution command opens/closes a socket listening for an incoming UDP connection on a specified port.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
	Value:		
	1÷conMax :		socket connection identifier. conMax value is returned by test command
<listenState>	integer	0	indicates the action that will be performed
	Values:		
	0 :		closes socket listening
	1 :		starts socket listening
<listenPort>	integer	1	local listening port
	Value:		
	1÷65535 :		available port numbers

Not Subject to NDA

If the ListenAutoRsp flag has not been set through the command **#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

when closing the listening socket <**listenPort**> is a don't care parameter

AT#SLUDP?

Read command returns all the actual listening UDP sockets.

AT#SLUDP=?

Test command returns the range of supported values for all the sub parameters.

Not Subject to NDA

Next command opens a socket listening for UDP on port 3500.

```
AT#SLUDP=1,1,3500
OK
```


Not Subject to NDA

3.17.16. AT#USERID - Authentication User ID

This command sets the user identification string.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#USERID=[<user>]

Set command sets the user identification string to be used during the authentication step.

Parameter:

Name	Type	Default	Description
<user>	string	-	it is the authentication User Id; the max length for this value is the output of Test command, **AT#USERID=?** (factory default is the empty string "").

AT#USERID?

Read command reports the current user identification string, in the format:

#USERID: <user>

AT#USERID=?

Test command returns the maximum allowed length of the string parameter <**user**>.

Not Subject to NDA

- AT#USERID="myName"
  OK

  AT#USERID?
  #USERID: "myName"

  OK

Not Subject to NDA

3.17.17. AT#SLASTCLOSURE - Detect the Cause of a Socket Disconnection

The command detects the cause of a socket disconnection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SLASTCLOSURE=<connId>

Execution command reports the socket disconnection cause.

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier

Value:

1÷conMax : socket connection identifier. conMax value is returned by test command

Additional info:

The execution command reports the disconnection cause of the selected socket. The format of the returned message is:

#SLASTCLOSURE: <connId>,<cause>

Name	Type	Default	Description
<cause>	hex	0	socket disconnection cause.

Values:

0 : not available (socket has not yet been closed)

Not Subject to NDA

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 other 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)

Any time socket is re-opened, last disconnection cause is reset. Command report 0 (not available).

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.

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)

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.

In case of UDP, cause 2 indicates abnormal (local) disconnection. Cause 3 and 4 are still possible.
(Cause 1 is obviously never possible)

Not Subject to NDA

In case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data (**#SRECV** or **SRING** mode 2), it is indicated cause 1 for both possible FIN and RST from remote.

AT#SLASTCLOSURE=?

Test command reports the supported range for parameter <**connId**>

Not Subject to NDA

3.17.18. AT#SI - Socket Info

This command is used to get socket information.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SI[=<connId>]

Execution command returns information about all sockets data traffic.

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
	Value:		
	1÷conMax	:	supported range (conMax value is returned by test command)

Additional info:

The response format is:

#SI: <connId>,<sent>,<received>,<buff_in>,<ack_waiting>[,<cause>]

Name	Type	Default	Description
<connId>	integer	-	socket connection identifier
<sent>	integer	-	total amount (in bytes) of sent data since the last time the socket connection identified by **<connId>** has been opened
<received>	integer	-	total amount (in bytes) of received data since the last time the socket

Not Subject to NDA

			connection identified by **<connId>** has been opened
<buff_in>	integer	-	total amount (in bytes) of data just arrived through the socket connection identified by **<connId>** and currently buffered, not yet read
<ack_waiting>	integer	-	total amount (in bytes) of sent and not yet acknowledged data since the last time the socket connection identified by **<connId>** has been opened
<cause>	integer	-	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 other 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)

Not yet acknowledged data are available only for TCP connections.

The value **<ack_waiting>** is always 0 for UDP connections.

Not Subject to NDA

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: <connIdconMax>,<sentconMax>,<received**conMax**>,<buff_in**conMax**>,<ack_waiting**conMax**>

Only if <closureType> is set to 254 and <closureTypeCmdModeEnabling> is set to 1, AT#SI response format will be:

#SI: <connId>,<sent>,<received>,<buff_in>,<ack_waiting>,<cause>

AT#SI=?

Test command reports the range for parameter **<connId>**.

Not Subject to NDA

- AT#SI

  #SI: 1,123,400,10,50

  #SI: 2,0,100,0,0

  #SI: 3,589,100,10,100

  #SI: 4,0,0,0,0

  #SI: 5,0,0,0,0

  #SI: 6,0,98,60,0

  ...

  OK

  Sockets 1,2,3,6 are opened with some data traffic.

  For example, socket 1 has 123 bytes sent, 400 bytes received, 10 bytes 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

Not Subject to NDA

3.17.19. AT#PADCMD - PAD Command Features

This command sets features of the pending data flush to socket, opened with **#SD** command.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PADCMD=<mode>

Set command for features of the pending data flush to socket, opened with **#SD** command.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	enable/disable forwarding Values: 0 : Bit 1: disable forwarding 1 : Bit 1: enable forwarding

Forwarding depends on character defined by **#PADFWD**.

Other bits are reserved.

AT#PADCMD?

Read command reports the currently selected <**mode**> in the format:

#PADCMD: mode

AT#PADCMD=?

Not Subject to NDA

Test command reports the supported range of values for parameter <mode>.

Not Subject to NDA

3.17.20. AT#PADFWD - PAD Forward Character

PAD forward character

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PADFWD=<char>[,<mode>]

Set command sets the char that immediately flushes pending data to socket opened by AT**#SD** command

Parameters:

Name	Type	Default	Description
<char>	integer	1	specifies the ascii code of the char used to flush data Value: 0÷255 : ascii code of the char used to flush data
<mode>	integer	0	flush mode Values: 0 : normal mode 1 : reserved

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>

Not Subject to NDA

AT#PADFWD=?

Test command reports the supported range of values for parameters <**char**> and <**mode**>

Not Subject to NDA

3.17.21. AT#E2SLRI - Socket Listen Ring Indicator

This command enables the Ring Indicator pin response to a Socket Listen connect.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Common profile	No	-	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:

Name	Type	Default	Description
<n>	integer	0	RI enabling

Values:

0 : RI disabled for Socket Listen connect

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=?

Not Subject to NDA

Test command returns the allowed values for parameter <n>.

Not Subject to NDA

3.17.22. AT#ICMP - Ping Support

Set command enables/disables the ICMP Ping support.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#ICMP=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	1	ICMP mode selection.

Values:

0 : disable ICMP Ping support

1 : enable firewalled ICMP Ping support: the module is sending a proper ECHO_REPLY only to a subset of IP Addresses pinging it; this subset of IP Addresses has been previously specified through #FRWL command.

2 : enable free ICMP Ping support; the module is sending 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=?

Not Subject to NDA

Test command reports the supported range of values for the <**mode**> parameter.

Not Subject to NDA

3.17.23. AT#PING - Send PING Request

This command is used to send Ping Echo Request.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT#PING=<IPaddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>[,<pdpId>]]]]]

Execution command is used to send Ping Echo Request messages and to receive the corresponding Echo Reply. Before sending PING Request the PDP context must be activated by **#SGACT** command.

Once the single Echo Reply message is received, a string like that is displayed:

#PING: <replyId>,<Ip Address>,<replyTime>,<ttl>

Parameters:

Name	Type	Default	Description
<IPaddr>	string	-	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>	integer	4	the number of Ping Echo Request to send Value: 1÷64 : Ping Echo Request number

Not Subject to NDA

<len>	integer	32	the length of Ping Echo Request message Value: 32÷1460 : Ping Echo Request length
<timeout>	integer	50	the timeout, in 100 ms units, waiting a single Echo Reply Value: 1÷600 : timeout, in 100 ms units
<ttl>	integer	128	time to live Value: 1÷255 : time to live
<pdpId>	integer	-	PDP context identifier 1..max - numeric parameter which specifies a particular PDP context definition **(default See #PROTOCOLCFG)** The value of max is returned by the Test command.

Additional info:

▶▶ <**pdpId**> default value.

The default value of this parameter depends on the software customization as shown in the following table.

Software customization	<pdpId> default value
Verizon	3
All other	1

Unsolicited fields:

Not Subject to NDA

Name	Type	Description
<replyId>	integer	Echo Reply number
<IpAddress>	string	IP address of the remote host
<replyTime>	integer	time, in 100 ms units, required to receive the response
<ttl>	integer	time to live of the Echo Reply message

- When the Echo Request timeout expires (no reply received on time) the response will contain <**replyTime**> set to 600 and <**ttl**> set to 255.
- To receive the corresponding Echo Reply is not required to enable separately **#ICMP**
- The format of IPv6 address isn't represented according to +CGPIAF setting
- If it doesn't use the pdpId, it will be tried PING by default value (See # PROTOCOLCFG)

AT#PING=?

Test command reports the supported range of values for the **#PING** command parameters.

Not Subject to NDA

- 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

Not Subject to NDA

3.17.24. AT#QDNS - Query DNS

The command executes a DNS query

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#QDNS[=<host name>]

Execution command executes a DNS query to solve the host name into an IP address.

Parameter:

Name	Type	Default	Description
<host name>	string	-	Host name string

Additional info:

- If the DNS query is successful then the IP address will be reported in the result code:

  #QDNS: <host name>,<IP address>[,<userIpType>]

Name	Type	Default	Description
<IP address>	string	-	this parameter is in the format: **xxx.xxx.xxx.xxx**
<userIpType>	integer	N/A	In dual stack case the user can choose the ip type to get IP address. According to this parameter DNS request will be sent
	Values:		

Not Subject to NDA

1 : IPv4

2 : IPv6

- the command has to activate the GPRS context if it not previously activated. In this case, the context deactivated after the DNS query.
- **<userIpType>** is only usable when **AT+CGDCONT** is ipv4v6.
- In case of Verizon, This command is valid only for Context 3.
- This command requires that the authentication parameters are correctly set and that the GPRS network is present.
- **When <userSockType> is "no ip type chosen"** ipv6 will be requested firstly. When ipv6 DNS server doesn't support so ipv4 will be requested.

AT#QDNS=?

#QDNS: <host name>,<userIpType>

Not Subject to NDA

3.17.25. AT#NTP - Calculate and Update Date and Time with NTP

Calculate and Update Data and Time with NTP

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#NTP=<name>[,<port>[,<update>[,<timeout>[,<tz>]]]]

This set command permits to calculate and update date and time through NTP protocol sending a request to a NTP server and then returns an intermediate response having the following format:

#NTP: "yy/MM/dd,hh:mm:ss+zz"

Parameters:

Name	Type	Default	Description
<name>	string	-	address of the NTP server This parameter can be either: any valid IP address in the format: "xxx.xxx.xxx.xxx" or "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" any host name to be solved with a DNS query
<port>	integer	123	NTP server port to contact Only default value can be selected since nonofficial ports are not supported. Interface to provide compatibility with ME910. Value: 1÷65535 : Port of the time server
<update>	integer	0	enable/disable system time update.

Not Subject to NDA

	Values: 0 : disable 1 : enable		
<timeout>	integer	1	waiting timeout for server responses in seconds Value: 1÷10 : Range of Inquiry timeout in seconds
<tz>	integer	0	Time Zone: indicates the difference, expressed in quarter of an hour, between the local time and GMT. -47 - 48 : in 15 minutes Value: -47÷48 : Time Zone

LE910Cx Linux products do not allow to set any port except for default port 123.

#SGACT must be called to activate the PDP context before calling #NTP command.

AT#NTP=?

Test command reports the supported range of values for parameter **<name>, <port>, <update>, <timeout>** and **<tz>.**

Not Subject to NDA

3.17.26. AT#NTPCFG - Configure NTP Parameters

This command allows to configure additional parameters to be used for NTP operations.

[1] Standard RFC5905

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#NTPCFG=<cid>[,<authType>[,<keyId>,<keysFilePath>]]

Set command allows to configure additional parameters to be used for NTP operations.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	Context id used to perform NTP operations. Refer to test command to know the supported range of values. Values: 1÷16 : LE910Cx ThreadX: context id for NTP operations 1÷6 : LE910Cx Linux: context id for NTP operations
<authType>	integer	0	Authentication type to be used with NTP server Values: 0 : do not authenticate server 1 : use symmetric key to authenticate server (see standard [1]), using <keyId> and

Not Subject to NDA

			<keysFilePath> to retrieve the required parameters
<keyId>	integer	-	if **<authType>** is 1, it provides the key Id to authenticate the server.
<keysFilePath>	string	-	if **<authType>** is 1, it provides the absolute path of the file where the server keys can be found. Only MD5 keys are supported.

The file containing the keys can be loaded in the module filesystem using **#M2MWRITE** command.

The key content is loaded from the file only when **#NTP** is issued.

AT#NTPCFG?

Read command reports the parameters current values in the format:

#NTPCFG: <cid>,<authType>

AT#NTPCFG=?

Test command reports the available range of **<cid>**, **<authType>** and **<keyId>** parameters values.

Set **<cid>**=3
AT#NTPCFG=3
OK

Set **<cid>**=1, symmetric key mode, **<keyId>**=1 and load the keys from the provided file
AT#NTPCFG=1,1,1,"/mod/server_keys.txt"
OK

Not Subject to NDA

3.17.27. AT#PROTOCOLCFG - Configure Protocol Parameters

This command configures the parameters needed to specific protocols.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PROTOCOLCFG=<protocol>,<cid>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>]]]

Set command defines the parameters needed to specific protocols.

Parameters:

Name	Type	Default	Description
<protocol>	string	N/A	protocol to be configured
	Values:		
	"FTP" : FTP protocol		
	"SMTP" : SMTP protocol		
	"PING" : PING service (ICMP protocol)		
	"SSL" : SSL protocol		
<cid>	integer	N/A	cid of the PDP context to be used for the specified protocol
	Value:		
	1÷max : identifier (max is returned by the test command)		
<UNUSED_1>	mixed	-	Reserved 1
<UNUSED_2>	mixed	-	Reserved 2
<UNUSED_3>	mixed	-	Reserved 3

Not Subject to NDA

For VZW products, default **<cid>** will be 3. The others will have 1 as default.

AT#PROTOCOLCFG?

Read command returns the current settings in the format:

#PROTOCOLCFG:"FTP",<cid>,<UNUSED_1>,<UNUSED_2>,<UNUSED_3><CR><LF>
#PROTOCOLCFG:"SMTP",<cid>,<UNUSED_1>,<UNUSED_2>,<UNUSED_3><CR><LF>
#PROTOCOLCFG:"PING",<cid>,<UNUSED_1>,<UNUSED_2>,<UNUSED_3><CR><LF>
#PROTOCOLCFG:"SSL",<cid>,<UNUSED_1>,<UNUSED_2>,<UNUSED_3><CR><LF>

the list could be different between a product and the other.

AT#PROTOCOLCFG=?

Test command returns values supported as a compound value.

Not Subject to NDA

3.17.28. AT#GDATAVOL - PS Data Volume

The command resets data counters or reports data counts of the PS sessions.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#GDATAVOL=[<mode>]

Execution command reports, for every active PDP context, the amount of data the last PS session received and transmitted, or it will report the total amount of data received and transmitted during all past PS sessions, since last reset.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	resets or reads data counters.

Values:

0 : resets the PS data counter for the all the available PDP contexts (1-16)

1 : reports the last PS session data counter for the all the set PDP contexts (i.e. all the PDP contexts with APN parameter set using +CGDCONT). Refer to Additional info section to see the format.

2 : reports the total PS data counter, since last reset, for the all the set PDP contexts (i.e. all the PDP context with APN parameter set using +CGDCONT). Refer to Additional info section to see the format.

Additional info:

Not Subject to NDA

▶▶ When <mode>=1, the command returns the following last data counts:

The message format is:

#GDATAVOL: <cid$_n$>,<tot$_n$>,<sent$_n$>,<received$_n$>[<CR><LF>
...
#GDATAVOL: <cid$_m$>,<tot$_m$>,<sent$_m$>,<received$_m$>[...]]

Each message line shows the data related to the n-th, m-th, and so on <cid>.

Name	Type	Default	Description
<cid>	integer	N/A	contexts identifiers Value: 0÷16 : context identifiers
<totn>	integer	-	number of bytes either received or transmitted in the last PS session for <cid$_n$> PDP context;
<sentn>	integer	-	number of bytes transmitted in the last PS session for <cid$_n$> PDP context;
<receivedn>	integer	-	number of bytes received in the last PS session for <cid$_n$> PDP context;

▶▶ When <mode>=2, the command returns the following total data counts, since last reset executed by AT#GDATAVOL=0

The message format is:

Not Subject to NDA

#GDATAVOL: <cid$_n$>,<tot$_n$>,<sent$_n$>,<received$_n$>[<CR><LF>
...
#GDATAVOL: <cid$_m$>,<tot$_m$>,<sent$_m$>,<received$_m$>[...]]

Each message line shows the data related to the n-th, m-th, and so on <cid>.

Name	Type	Default	Description
<totn>	integer	-	number of bytes either received or transmitted in every PS session since last reset, for **<cid$_n$>** PDP context.
<sentn>	integer	-	number of bytes transmitted, in every PS session since last reset, for **<cid$_n$>** PDP context
<receivedn>	integer	-	number of bytes received, in every PS session since last reset, for **<cid$_n$>** PDP context

Last PS session counters not saved in NVM so they are loosen at power off.

Total PS session counters saved on NVM.

AT#GDATAVOL=?

Test command returns the supported range of the **<mode>** parameter values.

Not Subject to NDA

3.17.29. AT#PASSW - Authentication Password

This command sets the user password string.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT#PASSW=[<pwd>]

Set command sets the user password string to be used during the authentication step.

Parameter:

Name	Type	Default	Description
<pwd>	string	-	it's the authentication password; the max length for this value is the output of Test command, **AT#PASSW=?** (Factory default is the empty string "").

AT#PASSW=?

Test command returns the maximum allowed length of the string parameter <**pwd**>.

- *Set the password "myPassord"*
  AT#PASSW="myPassword"
  OK

Not Subject to NDA

3.17.30. AT#SGACTAUTH - PDP Context Authentication Type

This command sets the authentication type for IP Easy

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<type>	integer	1	authentication type for IP Easy Values: 0 : no authentication 1 : PAP authentication 2 : CHAP authentication

the parameter is not saved in NVM.

as per the Telstra requirement, the default value for the Telstra is "0 - no authentication".

AT#SGACTAUTH?

Read command reports the current IP Easy authentication type, in the format:

Not Subject to NDA

#SGACTAUTH: <type>

AT#SGACTAUTH=?

Test command returns the range of supported values for parameter **<type>**.

Not Subject to NDA

3.17.31. AT#PKTSZ - Packet Size

Set the TCP/UDP/IP packet size.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#PKTSZ=[<size>]

Set command sets the default packet size used by the TCP/UDP/IP stack for data sending. Used for online data mode only.

Parameter:

Name	Type	Default	Description
<size>	integer	300	packet size in bytes
	Values:		
	0	:	automatically chosen by the device
	1÷1500	:	packet size in bytes

AT#PKTSZ?

Read command reports the current packet size value.

After issuing command **AT#PKTSZ=0**, the read command reports the value automatically chosen by the device.

AT#PKTSZ=?

Test command returns the supported values of parameter **<size>**.

Not Subject to NDA

- AT#PKTSZ=100
  OK

  AT#PKTSZ?
  #PKTSZ: 100

  OK

  AT#PKTSZ=0
  OK

  AT#PKTSZ?
  #PKTSZ: 300

  OK

  value automatically chosen by device

Not Subject to NDA

3.17.32. AT#DSTO - Data Sending Time-Out

This command sets the maximum time to await before sending a packet whose size in less than the default one.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	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. Used for online data mode only.

Parameter:

Name	Type	Default	Description
<tout>	integer	50	packet sending time-out in 100ms units

Values:

0 : no time-out, wait forever for packets to be completed before send

1÷255 : hundreds of ms

in order to avoid low performance issues, it is suggested to set the data sending time-out to a value greater than 5

this time-out applies to data whose size is less than packet size and whose sending would have been delayed for an undefined time until new data to be sent had been received and full packet size reached

AT#DSTO?

Read command reports the current data sending time-out value.

Not Subject to NDA

AT#DSTO=?

Test command returns the allowed values for the parameter **<tout>**.

- **AT#DSTO=10** *->1 sec. time-out*
  OK

  AT#DSTO?
  #DSTO: 10

  OK

Not Subject to NDA

3.17.33. AT#SKTCT - Socket TCP Connection Time-Out

This command sets the TCP connection timeout to wait the first **CONNECT** message sent by the TCP peer.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<tout>	integer	600	TCP first **CONNECT** answer time-out in 100ms units Value: 10÷1200 : hundreds of ms

this time-out applies only to the time that the TCP stack waits for the **CONNECT** answer to its connection request.

The time for activate the GPRS and resolving the name with the DNS query (if the peer was specified by name and not by address) is not counted in this time-out.

AT#SKTCT?

Read command reports the current TCP connection time-out.

AT#SKTCT=?

Not Subject to NDA

Test command returns the allowed values for parameter **<tout>**.

- AT#SKTCT=600
  OK
  socket first connection answer time-out has been set to 60 s.

Not Subject to NDA

3.17.34. AT#SKTOP - Socket Open

This command activates the context number 1, proceeds with the authentication with the user ID and password previously set by #USERID and #PASSW commands, and opens a socket connection with the host specified in the #SKTSET command.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SKTOP

Execution command activates the context number 1, proceeds with the authentication with the user ID and password previously set by #USERID and #PASSW commands, and opens a socket connection with the host specified in the #SKTSET command. Eventually, before opening the socket connection, it issues automatically a DNS query to solve the IP address of the host name.

If the connection succeeds a CONNECT indication is sent, otherwise a NO CARRIER indication is sent.

This command is obsolete.

It's suggested to use the couple #SGACT and #SO instead of it.

AT#SKTOP=?

Test command returns the OK result code.

- AT#SKTOP

  ..GPRS context activation, authentication and socket open..

  CONNECT

Not Subject to NDA

3.17.35. AT#SKTSET - Socket Definition

This command sets the socket parameters values.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SKTSET=[<socketType>,<remotePort>,<remoteAddr>,[<closureType>],[<localPort>],[<userIpType>]]

Set command sets the socket parameters values.

Parameters:

Name	Type	Default	Description
<socketType>	integer	0	socket protocol type Values: 0 : TCP 1 : UDP
<remotePort>	integer	3333	remote host port to be opened Value: 1÷65535 : port number
<remoteAddr>	string	""	any valid IP address in the format: xxx.xxx.xxx.xxx - any valid IPv6 address in the format: - xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx or xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx - any host name to be solved with a DNS query in the format: <**host name**>

Not Subject to NDA

			Value: "" : remote host address
<closureType>	integer	0	socket closure behaviour for TCP Values: 0 : local host closes immediately when remote host has closed 255 : local host closes after an escape sequence (+++)
<localPort>	integer	N/A	local host port to be used on UDP socket Value: 1÷65535 : port number
<userIpType>	integer	0	ip type for socket to open Values: 0 : no ip type chosen 1 : IPv4 2 : IPv6

<closure type> parameter is valid only for TCP socket type.
For UDP sockets will be unused.

<local port> parameter is valid only for UDP socket type.
For TCP sockets will be unused.

The resolution of the host name is over when opening the socket.

Not Subject to NDA

Therefore, if an invalid host name given to the **#SKTSET** command an error message issued.

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.

Issuing command **#QDNS** will overwrite **<remote addr>** setting.

AT#SKTSET?

Read command reports the socket parameters values, in the format:

AT#SKTSET: <socket type>,<remote port>,<remote addr>,<closure type>,<local port>,<userIpType>

AT#SKTSET=?

Test command returns the allowed values for the parameters.

- **AT#SKTSET=0,1024,"www.telit.net"**

  OK

Not Subject to NDA

3.17.36. AT#SRECV - Socket Receive Data in Command Mode

The command permits the user to read data arrived through a connected socket when the module is in command mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<connId>	integer	NA	socket connection identifier Value: 1÷conMax : socket connection identifier. conMax value is returned by test command
<maxByte>	integer	NA	max number of bytes to read Value: 1÷1500 : max number of bytes to read
<UDPInfo>	integer	0	enables/disables the visualization of UDP datagram information. Values: 0 : UDP information disabled 1 : UDP information enabled, see Additional info section.

Not Subject to NDA

Additional info:

- If <UDPInfo> is set to 1 (AT#SRECV=<connId>,<maxBytes>,1), the command returns a message having the following format:

  #SRECV: <remoteIP>,<remotePort><connId>,<recData>,<dataLeft>

Name	Type	Default	Description
<remoteIP>	string	-	remote ip address
<remotePort>	string	-	remote port address
<recData>	integer	-	received data
<dataLeft>	integer	-	remaining bytes in the datagram.

Issuing #SRECV when there is no buffered data raises an error.

AT#SRECV=?

Test command returns the range of supported values for parameters <connId> <maxByte> and <UDPInfo>.

Not Subject to NDA

3.17.37. AT#ST - Socket Type

Socket Type

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#ST[=<connId>]

Set command reports the current type of the socket (TCP/UDP) and its direction (Dialer/Listener)

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier

Value:

1÷conMAX : socket connection identifier. conMax value is returned by test command

Additional info:

The response format is:

#ST: <connId>,<type>,<direction>

Name	Type	Default	Description
<type>	integer	N/A	socket type

Values:

0 : No socket

1 : TCP socket

Not Subject to NDA

	2 : UDP socket		
<direction>	integer	N/A	direction of the socket Values: 0 : None 1 : Dialer 2 : Listener

▶▶ Issuing **#ST** command without <**connId**> socket identifier, it returns information about type of all sockets. For each socket, the format of the returned message is:

#ST: <connId$_n$>,<type$_n$>,<direction$_n$><CR><LF>

AT#ST=?

Test command reports the range for parameter **<connId>**.

Not Subject to NDA

Examples for single socket and for all sockets

- For single socket

  AT#ST=3
  #ST: 3,2,1

  Socket 3 is an UDP dialer

- for all socket

  AT#ST
  #ST: 1,0,0
  #ST: 2,0,0
  #ST: 3,2,1
  #ST: 4,2,2
  #ST: 5,1,1

  ...

  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

Not Subject to NDA

3.17.38. AT#SKTL - Socket Listen

Command opens/closes the socket listening for connection requests.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SKTL=[<mode>[,<socket type>[,<input port>[,<closure type>]]]]

Execution command opens/closes the socket listening for connection requests.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	socket mode Values: 0 : closes socket listening 1 : starts socket listening
<socket type>	integer	N/A	socket protocol type Values: 0 : TCP protocol 1 : UDP protocol
<input port>	integer	N/A	local host input port to be listened Value: 1÷65535 : port number
<closure type>	integer	0	socket closure behaviour for TCP

Not Subject to NDA

Values:

0	:	local host closes immediately when remote host has closed
255	:	local host closes after an escape sequence (+++)

Additional info:

- 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>

Name	Type	Default	Description
<remote addr>	string	-	host address of the remote machine that contacted the device

- When the connection is established the **CONNECT** indication is given and the modem goes into data transfer mode.

- On connection close or when context is closed with **#GPRS=0** the socket is closed and no listen is anymore active.

- If the context is closed by the network while in listening, the socket is closed, no listen is anymore active and an unsolicited code is reported:

  #SKTL: ABORTED

Not Subject to NDA

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

AT#SKTL?

Read command returns the current socket listening **status** and the last settings of parameters **<socket type>**,**<input port>** and **<closure type>**, in the format:

#SKTL: <status>,<socket type>,<input port>,<closure type>

Additional info:

parameter meaning,

Name	Type	Default	Description
<status>	integer	N/A	socket listening status Values: 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>**.

Not Subject to NDA

- *Activate GPRS*

  AT#GPRS=1

  #GPRS: ###.###.###.###

  OK

  Start listening

  AT#SKTL=1,0,1024

  OK

  or

  AT#SKTL=1,0,1024,255

  OK

  Receive connection requests

  +CONN FROM: 192.164.2.1

  CONNECT

  exchange data with the remote host

  send escape sequence

  +++

  NO CARRIER

  Now listen is not anymore active

  to stop listening

  AT#SKTL=0,0,1024, 255

  OK

Not Subject to NDA

3.17.39. AT#SSENDUDP - Send UDP Data to a Specific Remote Host

This command allows to send data over UDP to a specific remote host.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSENDUDP=<connId>,<remoteIP>,<remotePort>

Set command allows, 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 module receives data from this or another host, it is able to send data to it.

Like command **#SSEND**, the device responds with **">"** prompt and waits for the data to send.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier Value: 1÷conMax : supported range. conMax value is returned by test command
<remoteIP>	string	-	IP address of the remote host in dotted decimal notation, string type: "xxx.xxx.xxx.xxx"
<remotePort>	integer	N/A	remote host port Value: 1÷65535 : supported range

Not Subject to NDA

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).

if successive resume of the socket to online mode Is performed (**#SO**), connection with first remote host is restored as it was before.

the maximum number of bytes to send is 1500

AT#SSENDUDP=?

Test command reports the supported range of values for parameters **<connId>, <remoteIP>** and **<remotePort>**.

Not Subject to NDA

- *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

Not Subject to NDA

OK

SRING: 1 *// UDP data from a remote host available*

AT#SI=1
#SI: 1,22,23,24,0 *// 24 bytes to read*

OK

AT#SRECV=1,24
#SRECV:1,24
message from second host

OK

AT#SS=1
#SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2>

OK

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

OK

Not Subject to NDA

3.17.40. AT#SSENDUDPEXT - Send UDP Data to a Specific Remote Host EXTENDED

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)

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	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:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier Value: 1÷conMax : supported range. conMax value is returned by test command
<bytestosend>	integer	N/A	bytes to be sent Value: 1÷1500 : supported range
<remoteIP>	string	-	IP address of the remote host in dotted decimal notation ("xxx.xxx.xxx.xxx")

Not Subject to NDA

<remotePort>	integer	N/A	remote host port Value: 1÷65535 : supported range

AT#SSENDUDPEXT=?

Test command reports the supported range of values for parameters **<connId>,<bytestosend>,<remoteIP>** and **<remotePort>.**

Not Subject to NDA

3.17.41. AT#BASE64 - Base64 Encoding/Decoding of Socket Sent/Received Data

This command is used to enable or disable base64 encoding and decoding data of a socket.

RFC 2045 - MIME
RFC 3548

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#BASE64=<connId>,<enc>,<dec>[,<unused_B>[,<unused_C>]]

Set command enables base64 encoding and decoding of data sent/received to/from the socket in online or in command mode.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier Value: 1÷max : socket connection identifier value (max value is returned by the Test command)
<enc>	integer	0	selects the encoding standard. The data received from serial port are base64 encoded according to the **<enc>** parameter and forwarded to the **<connId>** socket. Values: 0 : no encoding of data received from serial port. 1 : base64 encoding compliant to RFC 2045 - MIME standard. As indicated from RFC2045 the encoded

Not Subject to NDA

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 : base64 encoding compliant to RFC 3548 standard. As indicated from RFC3548 CRLF have not to be added.

<dec>	integer	0	selects the decoding standard. The data received from the **<connId>** socket, are decoded according to the **<dec>** parameter and forwarded to the serial port.

Values:

0 : no decoding of data received from socket <connId>

1 : base64 decoding compliant to RFC 2045 - MIME standard. 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 : base64 decoding compliant to RFC 3548 standard. 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.

<unused_B>	integer	-	reserved for future use
<unused_C>	integer	-	reserved for future use

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 it is necessary to set **AT#SKIPESC=1**.

Not Subject to NDA

To use #BASE64 in command mode, if data to send exceed maximum value for #SSENDEXT command, they must be divided in multiple parts. These parts must be a multiple of 57 bytes, except for the last one, to distinguish EOF condition (Base64 encoding rules). For the same reason if **#SRECV** command is used by the application to receive data, a multiple of 78 bytes must be considered.

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.

AT#BASE64?

Read command returns the current <enc>/<dec> settings for all the six sockets. The format is:

#BASE64:<connId$_1$><enc$_1$>,<dec$_1$>,0,0<CR><LF>

. . .

#BASE64:<connId$_{max}$>,<enc$_{max}$>,<dec**$_{max}$**>,0,0<CR><LF>

AT#BASE64=?

Test command returns the range of supported values of all parameters.

Not Subject to NDA

- Skip the escape sequence, its transmission is not enabled
  AT#SKIPESC=1
  OK

  Open a remote connection in online mode
  AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>
  CONNECT
  data sent without modifications (default)
  .....
  +++ (suspension)
  OK

  Encode data coming from serial port.
  AT#BASE64=<connId>,1,0
  OK

  Resume suspended socket
  AT#SO=<connId>
  CONNECT
  data received from serial port are base64 encoded and sent to the socket
  .....
  +++ (suspension)
  OK

  Decode data coming from socket.
  AT#BASE64=<connId>,0,1
  OK

  Resume suspended socket
  AT#SO=<connId>
  CONNECT
  data received from socket are base64 decoded and sent to the serial port
  .....
  +++ (suspension)
  OK

Not Subject to NDA

3.17.42. AT#SO - Socket Restore

Execution command resumes the direct interface to a socket connection which has been suspended by the escape sequence.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SO=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier

Value:

1÷conMax : socket connection identifier. conMax value is returned by test command

AT#SO=?

Test command reports the range of values for **<connId>** parameter

Not Subject to NDA

3.17.43. AT#SS - Socket Status

Execution command reports the current sockets status.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SS

Execution command reports the current sockets status using the following message format:

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>

[<connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>[...]]

Additional info:

- Parameters meaning.

Name	Type	Default	Description
<connId>	integer	-	socket connection identifier
<state>	integer	0	actual state of the socket

Values:

0 : socket closed

1 : socket with an active data transfer connection

2 : socket suspended

3 : socket suspended with pending data

4 : socket listening

Not Subject to NDA

5 : socket with an incoming connection. Waiting for the user accept or shutdown command

6 : socket in opening process. The socket is not in Closed state but still not in Active or Suspended or Suspended with pending data state

<locIP>	string	-	IP address associated by the context activation to the socket
<locPort>	integer	-	two meanings: 22. the listening port if we put the socket in listen mode 23. the local port for the connection if we use the socket to connect to a remote machine
<remIP>	string	-	when we are connected to a remote machine this is the remote IP address
<remPort>	string	-	it is the port we are connected to on the remote machine

AT#SS=?

Test command reports the range for **<connId>** parameter.

Not Subject to NDA

- Get information about all sockets.

  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.

Not Subject to NDA

3.17.44. AT#DNS - Manual DNS Selection

This command manually set primary and secondary DNS servers.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#DNS=<cid>,<primary>,<secondary>

Set command allows to manually set primary and secondary DNS servers for a PDP context defined by **+CGDCONT.**

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	numeric parameter which specifies a particular PDP context definition The value of max is returned by the Test command. Value: 1÷max : specifies a particular PDP context definition
<primary>	string	-	**Ipv4- manual primary DNS server**, string type, in the format "**xxx.xxx.xxx.xxx**" used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0") **Ipv6- manual primary DNS server**, string type, in the format "**xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx**" used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0". Ipv6 can also be in HEX format: "**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**"

Not Subject to NDA

<secondary>	string	-	**Ipv4- manual primary DNS server**, string type, in the format "**xxx.xxx.xxx.xxx**" used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0") **Ipv6- manual primary DNS server**, string type, in the format "**xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx**" used for the specified cid; we're using this value instead of the **primary DNS server** come from the network (default is "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0"). Ipv6 can also be in HEX format: "**xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx**"

- if **<primary> is "0.0.0.0"** and **<secondary> is not "0.0.0.0"**, then issuing **AT#DNS=...** raises an error.
- if **<primary> is "0.0.0.0"** were using the **primary DNS server** come from the network as consequence of a context activation.
- if **<primary> is not "0.0.0.0"** and **<secondary> is "0.0.0.0"**, then were using only the **manual primary DNS server.**
- the context identified by **<cid>** has to be previously defined, elsewhere issuing **AT#DNS=...** raises an error.
- 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>]]

Not Subject to NDA

In case +cgdcont determined as ipv4v6 the format is

[#DNS: <cid>,<primary ip4>,<primary ip6>,<secondary ip4>,<secondary ip6>[<CR><LF>

#DNS: <cid>,<primary ip4>,<primary ip6>,<secondary ip4>,<secondary ip6>]]

AT#DNS=?

Test command reports the supported range of values for the **<cid>** parameter only, in the format:

#DNS: (1-5),,

Not Subject to NDA

3.17.45. AT#CACHEDNS - DNS Response Caching

This command is related to DNS and DNS response caching.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#CACHEDNS=[<mode>]

Set command enables caching a mapping of domain names to IP addresses, as does a resolver library.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables caching
	Values:		
	0 : caching disabled; it cleans the cache too		
	1 : caching enabled		

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.

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.

It is recommended to clean the cache, if command **+CCLK** has been issued while the DNS Response Caching was enabled.

AT#CACHEDNS?

Not Subject to NDA

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)

Additional info:

- Response parameters

Name	Type	Default	Description
<hostn>	string	-	host name
<IPaddr>	string	-	IP address in the format "xxx.xxx.xxx.xxx"

Not Subject to NDA

3.17.46. AT#SSEND - Send Data in Command Mode

This command is used to send data through a connected socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSEND=<connId>

Execution command permits, while the module is in **command mode,** to send data through a connected socket.

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
	Value:		
	1÷conMax	:	supported range. conMax value is returned by test command

Additional info:

- 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.

- the maximum number of bytes to send is 1500.

- it's possible to use **#SSEND** only if the connection was opened by **#SD**, else the ME is raising an error.

Not Subject to NDA

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 reports the range for parameter **<connId>.**

- *Send data through socket number 2.*

```
AT#SSEND=2
>Test<CTRL-Z>

OK
```


Not Subject to NDA

3.17.47. AT#SSENDEXT - Send Data in Command Mode extended

This command allows to send data through a connected socket including all possible octets (from 0x00 to 0xFF).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSENDEXT=<connId>,<bytestosend>

Set 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:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
	Value:		
	1÷conMax : supported range. conMax value is returned by test command		
<bytestosend>	integer	N/A	number of bytes to be sent
	Value:		
	1÷1500 : Please refer to test command for range. Refer to additional info for more detail.		

Additional info:

- **<bytestosend>** - number of bytes to be sent :

  The device responds to the command with the prompt '**>**' **<greater_than><space>** and waits for the data to send.

Not Subject to NDA

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.

it's possible to use **#SSENDEXT** only if the connection was opened by **#SD**, else the ME is raising an error.

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>**.

Not Subject to NDA

- *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.

Not Subject to NDA

3.17.48. AT#FRWL - Firewall Setup

This command controls the internal firewall settings.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FRWL=[<action>[,<ip_addr>[,<net_mask>]]]

Set command controls the internal firewall settings

Parameters:

Name	Type	Default	Description
<action>	integer	0	command action Values: 0 : remove selected chain 1 : add an ACCEPT chain 2 : remove all chains (DROP everything); <ip_addr> and <net_mask> have no meaning in this case.
<ip_addr>	string	-	remote address to be added into the ACCEPT chain; it can be any valid IP address in the format: xxx.xxx.xxx.xxx
<net_mask>	string	-	mask to be applied on the **<ip_addr>**; it can be any valid IP address mask in the format: xxx.xxx.xxx.xxx

Additional info:

Firewall criterion

The firewall applies for incoming (listening) connections only. Its general policy is DROP, therefore all packets that are not included into an ACCEPT chain rule will be silently discarded.

Not Subject to NDA

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 criterion is matched, then the packet is accepted and the rule scan is finished; if criteria are 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>.

- 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
  ```


Not Subject to NDA

Not Subject to NDA

3.17.49. AT#SKTD - Socket Dial

This command opens a socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SKTD=[<socketType>[,<remotePort>[,<remoteAddr>[,<closureType>[,<localPort>[,<userIpType>]]]]]]

Set command opens the socket towards the peer specified in the parameters.

Parameters:

Name	Type	Default	Description
<socketType>	integer	0	socket protocol type Values: 0 : TCP 1 : UDP
<remotePort>	integer	3333	remote host port to be opened Value: 1÷65535 : port number
<remoteAddr>	string	-	address of the remote host, string type. This parameter can be either: - any valid IP address in the format: **xxx.xxx.xxx.xxx** - any valid IPv6 address in the format: xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx or xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx

Not Subject to NDA

			- any host name to be solved with a DNS query
<closureType>	integer	0	socket closure behaviour for TCP Values: 0 : local host closes immediately when remote host has closed 255 : local host closes after an escape sequence (+++)
<localPort>	integer	N/A	local host port to be used on UDP socket Value: 1÷65535 : port number
<userIpType>	integer	0	ip type for socket to open Values: 0 : no ip type chosen 1 : IPv4 2 : IPv6

- **<closure type>** parameter is valid only for TCP socket type, for UDP sockets left unused.
- **<local port>** parameter is valid only for UDP socket type, for TCP sockets left unused.
- 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.
- the command to be successful requests that:

Not Subject to NDA

- 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

If all parameters omitted then the behaviour of Set command is the same as Read command.

The main difference between this command and #SKTOP is that this command does not interact with the GPRS context status, leaving it ON or OFF according to the #GPRS setting, therefore when the connection made with #SKTD is closed the context (and hence the local IP address) is maintained.

AT#SKTD?

Read command reports the socket dial parameters values, in the format:

AT#SKTD: <socket type>,<remote port>,<remote addr>,<closure type>,<local port>,<userIpType>

AT#SKTD=?

Test command returns the allowed values for the parameters.

Not Subject to NDA

- 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

Not Subject to NDA

3.17.50. AT#SKTSAV - Socket Parameters Save

This command stores the current socket parameters in the NVM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SKTSAV

Execution command stores the following socket parameters in the NVM:

24. User ID
25. Password
26. Packet Size
27. Socket Inactivity Time-Out
28. Data Sending Time-Out
29. Socket Type (UDP/TCP)
30. Remote Port
31. Remote Address
32. TCP Connection Time-Out

If some parameters have not been previously specified then a default value will be stored.

AT#SKTSAV=?

Test command returns **OK** result code.

- **AT#SKTSAV**

  OK

  socket parameters have been saved in NVM

Not Subject to NDA

3.17.51. AT#SKTTO - Socket Inactivity Time-Out

The command sets the timeout on no data exchanging on the socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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 and deactivating the GPRS context.

Parameter:

Name	Type	Default	Description
<tout>	integer	90	socket inactivity time-out in seconds units
	Values:		
	0	:	no time-out
	1÷65535	:	time-out in seconds

this time-out applies when no data exchanged in the socket for a long time and therefore the socket connection automatically closed and the GPRS context deactivated.

AT#SKTTO?

Read command reports the current "socket inactivity time-out value".

AT#SKTTO=?

Test command returns the allowed values for parameter **<tout>**.

Not Subject to NDA

- AT#SKTTO=30

  OK

  ->(30 sec. time-out)

  AT#SKTTO?

  #SKTTO: 30

  OK

Not Subject to NDA

3.17.52. AT#NWDNS - DNS from Network

The command allows to get the primary and secondary DNS addresses for selected GSM or PDP context identifiers

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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.

Parameter:

Name	Type	Default	Description
<cid>	integer	N/A	numeric parameter which specifies a particular PDP context definition The value of max is returned by the test command.

Value:

1÷max : specifies a particular PDP context definition (see +CGDCONT command).

Additional info:

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>

Not Subject to NDA

#NWDNS: <cid>,<PDNSaddress>,<SDNSaddress> [...]]

Name	Type	Default	Description
<cid>	integer	-	context identifier
<PDNSaddress>	string	-	primary 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.
<SDNSaddress>	string	-	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.

if no **<cid>** is specified, the DNS addresses for all defined contexts are returned.

issuing the command with more than 6 parameters raises an error.

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> [...]]

Not Subject to NDA

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.

Not Subject to NDA

3.17.53. AT#TCPREASS - TCP Reassembly

This command sets enables/disables the TCP Reassembly feature.

In TCP/IP, packets can be fragmented according to the specification, so it is necessary to reassemble the fragmented packet in the TCP/IP stack layer.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#TCPREASS=<n>

Set command enables/disables the TCP reassembly feature, in order to handle fragmented TCP packets.

Parameter:

Name	Type	Default	Description
<n>	integer	1	Enable TCP reassembly feature. Value: 1 : Enable TCP reassembly feature

Additional info:

- Disable TCP reassembly feature is not supported.

AT#TCPREASS?

Read command returns whether the TCP reassembly feature is enabled or not, in the format:

#TCPREASS:<n>

Not Subject to NDA

AT#TCPREASS=?

Test command returns the supported range of values for parameter **<n>**

Not Subject to NDA

3.17.54. AT#TCPMAXDAT - Maximum TCP Payload Size

This command sets the maximum TCP Payload Size.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#TCPMAXDAT=<size>

Set command allows setting the maximum TCP payload size in TCP header options.

Parameter:

Name	Type	Default	Description
<size>	integer	0	Maximum TCP payload size accepted in one single TCP/IP datagram. It is sent in TCP header options in SYN packet.
	Values:		
	0	:	the maximum TCP payload size is automatically handled by module
	496÷1420	:	maximum TCP payload size

AT#TCPMAXDAT?

Read command reports the current maximum TCP payload size, in the format.

#TCPMAXDAT:<size>

AT#TCPMAXDAT=?

Not Subject to NDA

Test command reports the supported range of values for parameter **<size>**

Not Subject to NDA

3.17.55. AT#TCPMAXWIN - Set Maximum TCP Window Size

This command sets Configure the TCP window size.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#TCPMAXWIN=[<winSize>[,<scalefactor>]]

This command permits to configure the TCP window size.

Parameters:

Name	Type	Default	Description
<winSize>	integer	0	TCP maximum window size
			Values: 0 : TCP window size is handled automatically by the module 536÷65535 : TCP window size value
<scalefactor>	integer	0	TCP scale factor
			Value: 0÷8 : TCP scale factor value

Additional info:

- command has to be set before opening socket connection (**#SD, #SL/SA, #FTPOPEN/GET/PUT...**) to take effect.

Not Subject to NDA

▶▶ It permits to slow down TCP when application wants to retrieve data slowly (for instance: cmd mode), to avoid early RST from server.

Some networks, such as Firstnet, may require a different TCP scale factor value. Otherwise it recommend to keep the default value.

AT#TCPMAXWIN?

Read command reports the currently selected **<winSize>,<scalefactor>** in the format:

#TCPMAXWIN:<winSize>,<scalefactor>

AT#TCPMAXWIN=?

Test command reports the supported range of values for parameter **<winSize>,<scalefactor>.**

Not Subject to NDA

3.17.56. AT#SIOWATERMARK - Configure SIO Tx Watermark Size

This command sets Configure the buffer size of SIO Tx Watermark.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SIOWATERMARK=<Low watermark size>,<High watermark size>,<Max watermark size>

Set command permits to configure the buffer size of SIO Tx Watermark.

Parameters:

Name	Type	Default	Description
<Low watermark size>	integer	50000	Set the Low buffer size of SIO Watermark Value: 1000÷50000 : Range Value
<High watermark size>	integer	75000	Set the High buffer size of SIO Watermark Value: 2000÷75000 : Range Value
<Max watermark size>	integer	108000	Set the Max buffer size of SIO Watermark Value: 10000÷108000 : Range Value

command has to be set before opening socket connection **(#SD)** to take effect.

Not Subject to NDA

If you use UART(lower then 115200). You may need to use this command.

Slow UART in LTE RAT cause the network to be disconnected.(relating to TCP_WINDOW_SIZE_FULL)

The high watermark shall be 1000 more than the low watermark.

The max watermark shall be 8000 more than the high watermark.

AT#SIOWATERMARK?

Read command returns the current parameter settings.

#SIOWATERMARK: <low watermark>,<high watermark>,<max watermark>

AT#SIOWATERMARK=?

Test command reports the supported range of parameters values.

Not Subject to NDA

3.18. FTPEasy

3.18.1. AT#FTPAPP - FTP Append

This command is used to append data to an already existing file via FTP during an FTP session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPAPP=<fileName>[,<connMode>]

Set 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.

Parameters:

Name	Type	Default	Description
<fileName>	string	-	the file name
<connMode>	integer	0	the connection mode Values: 0 : online mode 1 : command mode

If **<connMode>** is set to 1, the data connection is opened, the device remains in command mode and the **OK** result code is displayed (instead of **CONNECT**).

Use the escape sequence **+++** to close the data connection.

Not Subject to NDA

The command causes an **ERROR** result code 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**)

Additional info:

Parameter meaning.

Name	Type	Default	Description
<length>	integer	-	is the maximum length of **<fileName>**

Not Subject to NDA

3.18.2. AT#FTPAPPEXT - FTP Append Extended

The command sends data on a FTP data port while the module is in command mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<bytestosend>	integer	N/A	number of bytes to be sent
	Value:		
	1÷1500 : number of bytes		
<eof>	integer	0	data port closure
	Values:		
	0 : normal sending of data chunk		
	1 : close data port after sending data chunk		

Additional info:

- 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

Not Subject to NDA

Name	Type	Default	Description
<sentbytes>	integer	-	the number of sent bytes

<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**>.

Not Subject to NDA

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)

Not Subject to NDA

3.18.3. AT#FTPCLOSE - FTP Close Command

The command purpose is to close the previously open FTP connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPCLOSE

Execution command closes an FTP connection.

AT#FTPCLOSE=?

Test command returns the **OK** result code.

Not Subject to NDA

3.18.4. AT#FTPCWD - FTP Change Working Directory

Command to change the working directory on FTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPCWD=[<dirname>]

Execution command, issued during an FTP connection, changes the working directory on FTP server.

Parameter:

Name	Type	Default	Description
<dirname>	string	-	Name of the new working directory.

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.

Not Subject to NDA

3.18.5. AT#FTPDELE - FTP Delete

This command, issued during a FTP connection, allows to delete a file from the remote working directory.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPDELE=[<filename>]

Execution command, issued during a FTP connection, deletes a file from the remote working directory.

Parameter:

Name	Type	Default	Description
<filename>	string	-	Name of the file that must be deleted

This command returns an **ERROR** result code if no FTP connection has been opened yet.

This command returns an **ERROR** result code in case of delayed server response.

If this is the case, the **#FTPMSG** response is temporarily empty; a later check of the **#FTPMSG** response will show the server response.

AT#FTPDELE=?

Test command returns **OK** result code.

Not Subject to NDA

3.18.6. AT#FTPFSIZE - Get File Size from FTP Server

This command returns the size of a file located on a FTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPFSIZE=<filename>

Execution command, issued during an FTP connection, permits to get the size of a file located on a FTP server. The response format is:

#FTPFSIZE: <size>

Parameter:

Name	Type	Default	Description
<filename>	string	-	the name of the file that you want to know the size

Additional info:

- Parameter:

Name	Type	Default	Description
<size>	integer	-	dimension in bytes of the file located on the FTP server

AT#FTPTYPE=0 command must be issued before **#FTPFSIZE** command, to set file transfer type to binary mode.

Not Subject to NDA

AT#FTPFSIZE=?

Test command returns **OK** result code.

Not Subject to NDA

3.18.7. AT#FTPGET - FTP Get Command

This command executes the FTP Get function during an FTP connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#FTPGET=[<filename>]

Execution command opens a data connection and starts getting a file from the FTP server. If the data connection succeeds a **CONNECT** indication is sent and the file is received on the serial port.

Parameter:

Name	Type	Default	Description
<filename>	string	-	file name to get from server.

The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet.

Command closure should always be handled by application. To avoid download stall situations a timeout should be implemented by the application.

AT#FTPGET=?

Test command returns the **OK** result code.

Not Subject to NDA

3.18.8. AT#FTPGETPKT - FTP Get in Command Mode

FTP gets in command mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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, we remain in command mode and we see the result code **OK**.
Retrieval from FTP server of <**fileName**> is started, but data are only buffered in the module.
It is possible to read data afterwards issuing **#FTPRECV** command.

Parameters:

Name	Type	Default	Description
<fileName>	string	-	file name. Maximum length: 200 characters.
<viewMode>	integer	0	choose the view mode Values: 0 : text format 1 : hexadecimal format

The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet.

Command closure should always be handled by application. To avoid download stall situations a timeout should be implemented by the application.

Not Subject to NDA

AT#FTPGETPKT?

Read command reports current download state for <**fileName**> with <**viewMode**> chosen, in the format:

#FTPGETPKT: <remotefile>,<viewMode>,<eof>

Additional info:

- The following parameter signals the state of the file transmission.

Name	Type	Default	Description
<eof>	integer	N/A	End of file
	Values:		
	0 : file currently being transferred		
	1 : complete file has been transferred to FTP client		

AT#FTPGETPKT=?

Test command returns **OK** result code.

Not Subject to NDA

3.18.9. AT#FTPMSG - FTP Read Message

This command returns the last response received from the FTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPMSG

Execution command returns the last response received from the server during an FTP connection.

AT#FTPMSG=?

Test command returns the **OK** result code.

Not Subject to NDA

3.18.10. AT#FTPOPEN - FTP Connection Opening

This execution command opens an FTP connection toward the FTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPOPEN=[<server:port>,<username>,<password>[,<mode>]]

Execution command opens an FTP connection toward the FTP server.

Parameters:

Name	Type	Default	Description
<server:port>	string	-	address and port of FTP server (factory default port 21), in the format: "ipv4" / "ipv4:port" "ipv6" / "[ipv6]" / "[ipv6]:port" "dynamic_name" / "dynamic_name:port"
<username>	string	-	authentication user identification for FTP
<password>	string	-	authentication password for FTP
<mode>	integer	0	active or passive mode Values: 0 : active mode 1 : passive mode

In FTP Open case, the solution dependency limits the maximum time out to 1200 (120 seconds). The **FTPTO** value that exceed 1200 is considered as 1200.

Not Subject to NDA

Before opening FTP connection the GPRS must been activated with **AT#GPRS=1** or **AT#SGACT.**

AT#FTPOPEN=?

Test command returns the **OK** result code

Not Subject to NDA

3.18.11. AT#FTPPUT - FTP Send File

This command sends a file to the FTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	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.

Parameters:

Name	Type	Default	Description
<filename>	string	-	name of the file (maximum length 200 characters)
<connMode>	integer	0	select online or command mode: If online mode is selected (default) and the data connection succeeds, a **CONNECT** indication is sent; afterward a **NO CARRIER** indication is sent when the socket is closed. If command mode is selected and the data connection succeeds, we remain in command mode and we see the result code **OK** (instead of **CONNECT**). Values: 0 : online mode 1 : command mode

Use the escape sequence **+++** to close the data connection.

Not Subject to NDA

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**>.

Additional info:

The format is:

#FTPPUT: <length>, (list of supported **<connMode>s**)

Name	Type	Default	Description
<length>	integer	-	maximum length of <**filename**>

Not Subject to NDA

3.18.12. AT#FTPPWD - FTP Print Working Directory

This command, issued during an FTP connection, shows the current working directory on FTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPPWD

Execution command, issued during an FTP connection, shows the current working directory on FTP server.

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.

Not Subject to NDA

3.18.13. AT#FTPRECV - Receive Data in Command Mode

The command permits the user to read a given amount of data already transferred via FTP from a remote file.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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.

Parameter:

Name	Type	Default	Description
<blockSize>	integer	N/A	maximum number of bytes to read
	Value:		
	1÷3000	:	maximum number of bytes to read

it's necessary to have previously opened FTP data port and started download and buffering of remote file through **#FTPGETPKT** command.

issuing **#FTPRECV** when there's no FTP data port opened raises an error.

data port will stay opened if socket is temporary waiting to receive data (**#FTPRECV** returns 0 and **#FTPGETPTK** gives an EOF 0 indication).

Not Subject to NDA

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 supported values for parameter <**blocksize**>.

Not Subject to NDA

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 * 888888888888888888

OK

AT#FTPRECV=200

#FTPRECV:200

88888 *

Text row number 9 * 999999999999999999999999 *

Text row number 10 * AAAAAAAAAAAAAAAAAAAAAAAAA* Text row number 11 * BBBBBBBBBBBBBBBBBBBBBBBBB *

Text row number 12 * CCCCCCCCCCCCCCC

OK

NOTE: to check when you have received complete file it's possible to use AT#FTPGETPKT read command:

AT#FTPGETPKT?

Not Subject to NDA

#FTPGETPKT:sample.txt,0,1

OK

(you will get <eof> set to 1)

Not Subject to NDA

3.18.14. AT#FTPREST - Set Restart Position for FTP GET

This command sets the restart position.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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:

Name	Type	Default	Description
<restartposition>	integer	-	position in byte of restarting for successive #FTPGET (or #FTPGETPKT)

It's necessary to issue #FTPTYPE=0 before successive #FTPGET (or #FTPGETPKT) to set binary file transfer type.

Setting **<restartposition>** has affect on successive FTP download.

After successive successfully initiated #FTPGET (or #FTPGETPKT) command, **<restartposition>** is automatically reset.

Value set for **<restartposition>** has affect on next data transfer (data port opened by #FTPGET or #FTPGETPKT).

Then **<restartposition>** value is automatically assigned to 0 for next download.

AT#FTPREST?

Not Subject to NDA

Read command returns the current **<restartposition>**

#FTPREST:<restartposition>

AT#FTPREST=?

Test command returns the OK result code.

Not Subject to NDA

3.18.15. AT#FTPTO - FTP Time Out

Set the FTP time out.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPTO=[<tout>]

Set command sets the time out used when opening either the FTP control channel or the FTP traffic channel.

Parameter:

Name	Type	Default	Description
<tout>	integer	100	time out in 100 milliseconds units Value: 100÷5000 : hundreds of milliseconds

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

Not Subject to NDA

3.18.16. AT#FTPTYPE - FTP Type

This command sets the FTP file transfer type.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#FTPTYPE=[<type>]

Set command, issued during a FTP connection, sets the file transfer type.

Parameter:

Name	Type	Default	Description
<type>	integer	N/A	file transfer type
	Values: 0 : binary 1 : ASCII		

The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

AT#FTPTYPE?

Read command returns the current file transfer type, in the format:

#FTPTYPE: <type>

AT#FTPTYPE=?

Test command returns the range of available values for parameter **<type>**:

Not Subject to NDA

#FTPTYPE: (0,1)

Not Subject to NDA

3.18.17. AT#FTPLIST - FTP List

This command is used during a FTP connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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	Type	Default	Description
<name>	string	-	is the name of the directory or file

The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

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.

Not Subject to NDA

3.18.18. AT#FTPCFG - FTP Configuration

This command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#FTPCFG=<tout>,<IPPignoring>[,<FTPSEn>[,<FTPext>]]

Sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

Parameters:

Name	Type	Default	Description
<tout>	integer	100	time out in 100 milliseconds units
Value:			
100÷5000 : hundreds of ms			
<IPPignoring>	integer	N/A	enable or disable IP private ignoring
Values:			
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			

Not Subject to NDA

	private IPV4 address the client doesn't consider this and connects with server using the IP address used in AT#FTPOPEN		
<FTPSEn>	integer	0	enable or disable FTPS security
Values: 0 : disable FTPS security: all FTP commands will perform plain FTP connections 1 : enable FTPS security			
<FTPext>	integer	0	FTP extension
Values: 0 : always use EPRT and EPSV commands 1 : if both module and server ipv4 use PORT and PASV commands Option added to pass-through firewall that is unaware of the extended FTP commands for FTPPUT, FTPLIST, FTPAPP, FTPGET			

if parameter **<tout>** is omitted the behavior of Set command is the same as Read command.

AT#FTPCFG?

Read command reports the currently selected parameters in the format:

AT#FTPCFG=<tout>,<IPPignoring>,<FTPSEn>,<FTPext>

Not Subject to NDA

AT#FTPCFG=?

Test command reports the supported range of values for parameter(s).

Not Subject to NDA

3.19. SMTP

3.19.1. AT#ESMTP - E-mail SMTP Server

This command allows to set the SMTP server address for e-mail sending.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#ESMTP=<smtp>

Set command sets the SMTP server address, used for sending e-mails. SMTP server can be specified as IP address or as nick name.

Parameter:

Name	Type	Default	Description
<smtp>	string	-	SMTP server address. This parameter can be either: 33. any valid IP address in the format: "**xxx.xxx.xxx.xxx**" 34. any host name to be solved with a DNS query in the format: **<host name>** (factory default is the empty string "").

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 the command will refuse to send the e-mail.

AT#ESMTP?

Read Command reports the current SMTP server address, in the format:

#ESMTP: <smtp>

Not Subject to NDA

AT#ESMTP=?

Test command returns the max length for the parameter **<smtp>**.

Example of SMTP server format name:

```
AT#ESMTP="smtp.mydomain.com"
OK
```


Not Subject to NDA

3.19.2. AT#APPSKTCFG - Configure Socket Parameters

This command sets the parameters needed to socket services (FTP, SMTP, HTTP).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#APPSKTCFG=<connTo>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>[,<UNUSED_4>]]]]

Set command sets the parameters needed to socket services (FTP, SMTP, HTTP)

Parameters:

Name	Type	Default	Description
<connTo>	integer	0	connection timeout. If a connection can not be established to the remote host within this period, an error is raised. Values: 0 : internal stack timeout value 10÷1200 : timeout value in hundreds of milliseconds
<UNUSED_1>	integer	-	reserved for future use
<UNUSED_2>	integer	-	reserved for future use
<UNUSED_3>	integer	-	reserved for future use
<UNUSED_4>	integer	-	reserved for future use

values are automatically saved in NVM.

AT#APPSKTCFG?

Not Subject to NDA

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

Not Subject to NDA

3.19.3. AT#SEMAIL - E-mail Sending With GPRS Context Activation

This command activates a GPRS context and sends an e-mail message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SEMAIL=[<da>,<subj>]

Execution command activates a GPRS context, if not previously activated by **#EMAILACT**, and sends an e-mail message. The GPRS context is deactivated when the e-mail is sent.

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.

Parameters:

Name	Type	Default	Description
<da>	string	-	destination address
<subj>	string	-	subject of the message (maximum length 100 characters).

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.

This command is obsolete. It's suggested to use the couple **#EMAILACT** and **#EMAILD** instead of it.

Not Subject to NDA

When SMTP over SSL is enabled, this command will not activate a GPRS context. Instead, use **#EMAILACT** before.

AT#SEMAIL=?

Test command returns the **OK** result code.

- **AT#SEMAIL="me@myaddress.com","subject of the mail"**
  >message body... *This is the text of the mail message...*
  CTRL-Z
  ..wait..

  OK

  Message has been sent.

Not Subject to NDA

3.19.4. AT#EMAILACT - E-mail GPRS Context Activation

This command deactivates/activates the GPRS context.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#EMAILACT=[<mode>]

Execution command deactivates/activates the GPRS context, eventually proceeding with the authentication with the parameters given with **#PASSW** and **#USERID**.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	GPRS context activation mode Values: 0 : GPRS context deactivation request 1 : GPRS context activation request

AT#EMAILACT?

Read command reports the current status of the GPRS context for the e-mail, in the format:

#EMAILACT: <status>

Additional info:

- Response format meanings

Not Subject to NDA

Name	Type	Default	Description
<status>	integer	N/A	GPRS status Values: 0 : GPRS context deactivated 1 : GPRS context activated

AT#EMAILACT=?

Test command returns the allowed values for parameter **<mode>.**

- **AT#EMAILACT=1**

  OK

  Now GPRS Context has been activated

  AT#EMAILACT=0

  OK

  Now GPRS context has been deactivated.

Not Subject to NDA

3.19.5. AT#SMTPCFG - Configure SMTP Parameters

Configure SMTP parameters

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SMTPCFG=<ssl_enabled>[,<port>[,<mode>[,<UNUSED_1>[,<UNUSED_2>[,<UNUSED_3>]]]]]

Sets the parameters needed to the SMTP connection

Parameters:

Name	Type	Default	Description
<ssl_enabled>	integer	0	Numeric parameter indicating if the SSL encryption is enabled Values: 0 : SSL encryption disabled 1 : SSL encryption enabled
<port>	string	25	SMTP port to contact Value: 1÷65535 : SMTP ports to contact
<mode>	integer	0	SMTP start session command Values: 0 : SMTP start session command HELO 1 : SMTP start session command EHLO
<UNUSED_1>	integer	-	for future purposes
<UNUSED_2>	integer	-	for future purposes

Not Subject to NDA

some servers support an obsolete implementation of SMTPS on port 465.

The module only supports the standard implementation of SMTP over SSL/TLS described in RFC 3207.

So do not use port 465 on servers with an obsolete implementation of SMTPS: the module will not work properly.

Use instead port 25 or port 587.

<mode> not implemented and should be 0.

AT#SMTPCFG?

Read command returns the current settings in the format:

#SMTPCFG: <ssl_enabled>,<port>,<mode>,0,0,0<CR><LF>

AT#SMTPCFG=?

Test command returns the supported range of parameters **<ssl_enabled>**, **<port>** and **<mode>** in the format:

#SMTPCFG: (list of supported <ssl_enabled>s),(list of supported <port>s),(list of supported <mode>s),(0),(0),(0)

Not Subject to NDA

3.19.6. AT#EADDR - E-mail Sender Address

This command sets the sender address string to be used for sending the e-mail.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#EADDR=[<eAddr>]

Parameter:

Name	Type	Default	Description
<eAddr>	string	""	sender address. This parameter can be set to any string with any length up to the one reported by the test command. Value: "" : default value

AT#EADDR?

Read command reports the current sender address, in the format:

#EADDR: <eAddr>

AT#EADDR=?

Test command returns the maximum allowed length of the string parameter **<eAddr>**.

Not Subject to NDA

The examples describe how to set and get the sender e-mail address.

- Set the sender e-mail address.

  AT#EADDR="me@email.box.com"

  OK

- Get sender e-mail address.

  AT#EADDR?

  #EADDR: "me@email.box.com"

  OK

Not Subject to NDA

3.19.7. AT#ERST - E-mail Parameters Reset

This execution command resets the e-mail parameters to the "factory default" configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#ERST

The e-mail parameters to reset are:

35. E-mail User Name
36. E-mail Password
37. E-mail Sender Address
38. E-mail SMTP server

AT#ERST=?

Test command returns the **OK** result code.

Not Subject to NDA

3.19.8. AT#EMAILMSG - SMTP Read Message

The command returns the last response from SMTP server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT#EMAILMSG

Execution command returns the last response from SMTP server.

AT#EMAILMSG=?

Test command returns the **OK** result code.

Not Subject to NDA

3.19.9. AT#EUSER - E-mail Authentication User Name

This command sets the user identification string to be used during the SMTP authentication step.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Other	No	-	2

AT#EUSER=[<eUser>]

Parameter:

Name	Type	Default	Description
<eUser>	string	""	string containing the e-mail authentication User ID Value: "" : factory default

If no authentication is required then the **<eUser>** parameter must be the empty string "".

AT#EUSER?

Read command returns the value of the current user identification string **<e-user>**, in the format:

#EUSER: <eUser>

AT#EUSER=?

Test command returns the maximum allowed length of the string parameter **<eUser>**

Not Subject to NDA

```
AT#EUSER="myE-Name"
OK

AT#EUSER?
#EUSER: "myE-Name"
OK
```


Not Subject to NDA

3.19.10. AT#ESAV - E-mail Parameters Save

This execution command stores the e-mail parameters in the NVM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#ESAV

The e-mail parameters that are stored are:

39. E-mail User Name
40. E-mail Password
41. E-mail Sender Address
42. E-mail SMTP server

AT#ESAV=?

Test command returns the **OK** result code.

If a parameter value has not been previously specified using the e-mail parameters setting commands, like **#EADDR**, then a default value will be taken.

Not Subject to NDA

3.19.11. AT#EMAILPDPCFG - Configure Email PDP Cid

This command gets configure email PDP cid

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#EMAILPDPCFG=<cid>

This command sets the cid that used for email PDP Context

Parameter:

Name	Type	Default	Description
<cid>	integer	-	Numeric parameter indicating the PDP Context Identifier Range: (1-max). Default: 1(in VZW products default is 3) The value of max is returned by the Test command

AT#EMAILPDPCFG?

Read command returns the current used cid in the format:

AT#EMAILPDPCFG?
#EMAILPDPCFG: 1

OK

AT#EMAILPDPCFG=?

Test command reports the supported range of values for parameter **<cid>.**

Not Subject to NDA

AT#EMAILPDPCFG=?

#EMAILPDPCFG: (1-max)

OK

Not Subject to NDA

3.19.12. AT#EPASSW - E-mail Authentication Password

This command sets the password string to be used during the authentication step of the SMTP.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#EPASSW=[<ePwd>]

Parameter:

Name	Type	Default	Description
<ePwd>	string	""	e-mail authentication password that can have any string value up to max length reported by test command Value: "" : factory default

If no authentication is required then the **<ePwd>** parameter shall be empty "".

AT#EPASSW=?

Test command returns the maximum allowed length of the string parameter **<ePwd>**.

```
AT#EPASSW="myPassword"
OK
```


Not Subject to NDA

3.19.13. AT#EMAILD - E-mail Sending

This command sends an e-mail message.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#EMAILD=[<da>,<subj>]

A PDP context has already been activated with **AT#SGACT**=1,1 or **AT#EMAILACT**=1 or **AT#GPRS**=1.

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.

Parameters:

Name	Type	Default	Description
<da>	string	-	destination address (maximum length 100 characters).
<subj>	string	-	subject of the message (maximum length 100 characters).

If the length of one of the string type parameters exceeds the maximum length, then module returns an error indication.

Care must be taken to ensure that during the command execution, no other commands are issued: to avoid malfunctions it is suggested to wait for the **OK** or **ERROR** / **+CMS ERROR:<err>** response before issuing further commands.

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maximum size for message body is 12KB. trying to send more data will cause the surplus to be discarded and lost.

In case of Verizon Network Operator, **AT#SGACT=3,1** or **AT#EMAILACT=1** or **AT#GPRS=1**.

AT#EMAILD=?

Test command returns **OK** result code.

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.

Not Subject to NDA

3.20. HTTP

3.20.1. AT#HTTPCFG - Configure HTTP Parameters

This command sets the parameters needed to the HTTP connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout>[,<cid>[,<unused1>[,<unused2>]]]]]]]]]]

Sets the parameters needed to the HTTP connection

Parameters:

Name	Type	Default	Description
<prof_id>	integer Value: 0÷2 :	N/A	indicating the profile identifier Profile identifier
<server_address>	string	-	IP address of the HTTP server. This parameter can be either: 43. any valid IP address in the format: "**xxx.xxx.xxx.xxx**" 44. any valid IPv6 address in one of the following format: "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" 45. any host name to be solved with a DNS query. Default: "" for first and second profile

Not Subject to NDA

			"m2mlocate.telit.com" for third profile
<server_port>	integer	N/A	indicating the TCP remote port of the HTTP server to connect to. default: 80 for first and second profile; 9978 for third profile. Value: 1÷65535 : TCP remote port of the HTTP server to connect to
<auth_type>	integer	0	indicating the HTTP authentication type. Values: 0 : no authentication 1 : basic authentication
<username>	string	-	indicating authentication user identification string for HTTP.
<password>	string	-	indicating authentication password for HTTP.
<ssl_enabled>	integer	0	indicating if the SSL encryption is enabled. Values: 0 : SSL encryption disabled 1 : SSL encryption enabled
<timeout>	integer	120	indicating the time interval in seconds to wait for receiving data from HTTP server. Value: 1÷65535 : time interval in seconds to wait for receiving data from HTTP server.

Not Subject to NDA

<cid>	integer	N/A	indicating the PDP Context Identifier. Value: 0÷max : where the value of max is returned by the Test Command

- an ERROR is issued if **<UNUSED_1>** and **<UNUSED_2>** parameters are set with a value different from 0.
- a special form of the Set command, **#HTTPCFG=<prof_id>**, causes the values for profile number **<prof_id>** to reset to default values.
- For VZW products, default **<cid>** will be 3. The others will have 1 as default.
- only one profile can use the SSL encryption.
- HTTP AT command is supported the connection for IPv6 Server.
- For WLAN, <UNUSED_1> is considered as <ssl_verify>, to enable or disable CA certificate validation.

  <UNUSED_1> parameter can be set to 0 or 1.

  <UNUSED_2> parameter can be set only to 0.
- HTTP AT command is supported the connection for IPv6 Server.

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>,0,0<CR><LF>[<CR><LF>

#HTTPCFG:<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,0,0<CR><LF>

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#HTTPCFG:<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,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 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)

Additional info:

- parameter meaning,

Name	Type	Default	Description
<s_length>	integer	-	indicating the maximum length of parameter **<server_address>**.
<u_length>	integer	-	indicating the maximum length of parameter **<username>**.
<p_length>	integer	-	value indicating the maximum length of parameter **<password>.**

Not Subject to NDA

3.20.2. AT#HTTPSND - Send HTTP POST or PUT request

This command performs a POST or PUT request to HTTP server and starts sending data to the server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#HTTPSND=<prof_id>,<command>,<resource>,<data_len>[,<post_param>[,<extra_header_line>]]

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:

Name	Type	Default	Description
<prof_id>	integer	N/A	indicating the profile identifier Value: 0÷2 : profile identifier
<command>	integer	N/A	indicating the command requested Values: 0 : POST command 1 : PUT command
<resource>	string	-	indicating the HTTP resource (uri), object of the request
<data_len>	integer	-	indicating the data length to input in Bytes

Not Subject to NDA

<post_param>	mixed	N/A	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
	Values:		
	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	-	indicating optional HTTP header line. If sending ends successfully, the response is **OK**; otherwise an error code is reported.

Additional info:

- 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>

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Name	Type	Default	Description
<prof_id>	integer	-	profile identifier
<http_status_code>	integer	-	status code, as received from the server (see RFC 2616)
<content_type>	string	-	reporting the **"Content-Type"** header line, as received from the server (see RFC 2616)
<data_size>	integer	-	amount of data received from the server. If the server doesn't report the **"Content-Length:"** header line, the parameter value is 0.

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>

Additional info:

- parameters meaning,

Not Subject to NDA

Name	Type	Default	Description
<r_length>	integer	-	indicating the maximum length of parameter **<resource>.**
<p_length>	integer	-	indicating the maximum length of parameter **<post_param>.**
<m_length>	integer	-	indicating the maximum length of parameter **<extra_header_line>**

Not Subject to NDA

3.20.3. AT#HTTPRCV - Receive HTTP Server Data

This command permits the user to read data from HTTP server in response to a previous HTTP module request.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<prof_id>	integer	N/A	profile identifier
	Value:		
	0÷2 :	profile identifier	
<maxByte>	integer	0	max number of bytes to read at a time
	Values:		
	0 :	means infinite size	
	64÷1500 :	supported range	

if **<maxByte>** is unspecified, server data will be transferred all in once.

Not Subject to NDA

If the data are not present or the #HTTPRING <http_status_code> parameter has value 0, an error code is reported.

AT#HTTPRCV=?

Test command reports the supported range of values for <prof_id> parameter in the format:

#HTTPRCV: (list of supported <prof_id>s)

Not Subject to NDA

3.20.4. AT#HTTPQRY - Send HTTP GET, HEAD or DELETE Request

This command performs a GET, HEAD or DELETE request to HTTP server.

Standard RFC 2616

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#HTTPQRY=<prof_id>,<command>,<resource>[,<extra_header_line>]

Parameters:

Name	Type	Default	Description
<prof_id>	integer	N/A	profile identifier Value: 0÷2 : identifier values
<command>	integer	N/A	identifies command requested to HTTP server Values: 0 : GET 1 : HEAD 2 : DELETE
<resource>	string	-	is the HTTP resource (URI), object of the request
<extra_header_line>	string	-	is the optional HTTP header line

Additional info:

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- 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>

  If there are no data from server or the server does not answer within the time interval specified in <**timeout**> parameter of **#HTTPCFG** command, then the URC **#HTTPRING** **<http_status_code>** parameter has value 0.

Name	Type	Default	Description
<http_status_code>	string	-	is the status code, as received from the server, see RFC 2616
<content_type>	string	-	reports the "Content-Type" header line, as received from the server, see RFC 2616
<data_size>	string	-	is the byte amount of data received from the server. If the server does not report the "Content-Length:" header line, the parameter value is 0.

- To set more than one HTTP header line in parameter **<extra_header_line>**, they have to be separated by ">>"

  Example:

  AT#HTTPQRY=0,0, "myURI","Content-Type: xyz>>Authorization: something"

Not Subject to NDA

If sending ends successfully, the response is **OK**; otherwise an error code is reported.

The HTTP request header sent with **#HTTPQRY** always contains the "Connection: close" line, and it cannot be removed.

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>**

Additional info:

- Meaning of **<..._length>** parameters:

Name	Type	Default	Description
<r_length>	integer	-	maximum length of parameter <**resource**>.
<m_length>	integer	-	maximum length of parameter <**extra_header_line**>.

Not Subject to NDA

3.21. SSL

3.21.1. AT#SSLCFG - Configure General Parameters of a SSL Socket

This command configures SSL connection parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLCFG=<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>[,<sslSRingMode>[,<noCarrierMode>[,<skipHostMismatch>[,<UNUSED_4>]]]]

Set command allows configuring SSL connection parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
	Value:		
	1 : Until now SSL block manages only one socket		
<cid>	integer	-	PDP context identifier, see **+CGDCONT** command.
<pktSz>	integer	0	packet size to be used by the SSL/TCP/IP stack for data sending
	Values:		
	0 : select automatically default value (300)		
	1÷1500 : number of bytes		
<maxTo>	integer	90	exchange timeout or socket inactivity timeout. In online mode, if there's no data

Not Subject to NDA

			exchange within this timeout period, the connection is closed. Values: 0 : no timeout 1÷65535 : timeout in seconds
<defTo>	integer	100	timeout that will be used by default whenever the corresponding parameter of each command is not set. Value: 10÷5000 : timeout in tenth of seconds
<txTo>	integer	50	data sending timeout. In online mode, after this period data are sent also if they're less than max packet size. Values: 0 : no timeout 1÷255 : timeout value in hundreds of milliseconds
<sslSRingMode>	integer	0	sslSRing unsolicited mode Values: 0 : SSLSRING disabled 1 : SSLSRING enabled in the format 2 : SSLSRING enabled in the format
<noCarrierMode>	integer	0	permits to choose NO CARRIER indication format when the secure socket is closed.

Not Subject to NDA

Values:

0 : NO CARRIER (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> (refer to additional info)

<skipHostMismatch>	integer	1	ignores Host Mismatch alert

Values:

0 : Do not ignore

1 : Ignore

<UNUSED_4>	integer	-	Reserved 4

Additional info:

- **<sslSRingMode>** - sslSRing unsolicited mode:

  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

  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

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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:

  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.

these parameters cannot be changed if the secure socket is connected.

AT#SSLCFG?

Read command reports the currently selected parameters in the format:

#SSLCFG: <SSId1>,<cid>,<pktSz>,<maxTo>,<defTo><txTo>,<sslSRingMode>,<noCarrierMode>,<skipHostMismatch>,0

Not Subject to NDA

AT#SSLCFG=?

Test command returns the range of supported values for all the parameters.

#SSLCFG: (1),(1-16),(0-1500),(0-65535),(10-5000),(0-255),(0-2),(0-2),(0-1),(0)

Not Subject to NDA

3.21.2. AT#SSLSECCFG - Configure Security Parameters of a SSL Socket

Configure security parameters of a SSL socket

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLSECCFG=<SSId>, <CipherSuite>, <auth_mode> [,<cert_format>]

This command allows configuring SSL connection parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier Value: 1 : Until now only one SSL socket is available
<CipherSuite>	integer	0	cipher suite, In case of LE910C1-EUX/LE910C1-SAX/LE910C1-SVX/LE910Cx-WWX, refer to NOTE for supported CipherSuite. Values: 0 : cipher suite is chosen by remote server 1 : TLS_RSA_WITH_3DES_EDE_CBC_SHA 2 : TLS_RSA_WITH_AES_128_CBC_SHA 3 : TLS_RSA_WITH_AES_128_CBC_SHA256 4 : TLS_RSA_WITH_AES_256_CBC_SHA 5 : TLS_RSA_WITH_AES_256_CBC_SHA256 6 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA

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	7 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA 8 : TLS_DHE_RSA_WITH_3DES_EDE_CBC_SHA 9 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA256 10 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA256		
<auth_mode>	integer	0	authentication mode Values: 0 : SSL Verify None 1 : manage server authentication 2 : manage server and client authentication if requested by the remote server
<cert_format>	integer	1	It selects the format of the certificate to be stored via **#SSLSECDATA** command Values: 0 : DER format 1 : PEM format

it is supposed that the module is just powered on and the **AT#SSLSECCFG** command is entered without **<cert_format>** parameter, the default format is PEM. In this case the **AT#SSLSECCFG**? read command doesn't return the setting of the format in order to meet retro compatibility with other families. Now, let's assume that **AT#SSLSECCFG** command is entered again, but using the **<cert_format>** parameter for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the **<cert_format>** is omitted, the **AT#SSLSECCFG**? read command reports the parameter value entered the last time.

Server CAcertificate has to be stored through **AT#SSLSECDATA.**

Not Subject to NDA

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.

Supported CipherSuite for LE910C1-EUX/LE910C1-SAX/LE910C1-SVX/LE910Cx-WWX -

0 - unknown

1 - TLS_RSA_WITH_AES_128_CBC_SHA

2 - TLS_RSA_WITH_AES_128_CBC_SHA256

3 - TLS_RSA_WITH_AES_256_CBC_SHA

4 - TLS_RSA_WITH_AES_256_CBC_SHA256

5 - TLS_DHE_RSA_WITH_AES_128_CBC_SHA

6 - TLS_DHE_RSA_WITH_AES_256_CBC_SHA

7 - TLS_DHE_RSA_WITH_AES_128_CBC_SHA256

8 - TLS_DHE_RSA_WITH_AES_256_CBC_SHA256

AT#SSLSECCFG?

Read command reports the currently selected parameters in the format:

#SSLSECCFG: <SSId>,<CipherSuite>,<auth_mode>[,<cert_format>]

AT#SSLSECCFG=?

Test command returns the range of supported values for all the parameters.

#SSLSECCFG: (1),(0-10),(0-2),(0,1)

In case of LE910C1-EUX/LE910C1-SAX/LE910C1-SVX/LE910Cx-WWX,

#SSLSECCFG: (1),(0-8),(0-2),(0,1)

Not Subject to NDA

Not Subject to NDA

3.21.3. AT#SSLEN - Enable a SSL Socket

This command activates/deactivates a socket secured by SSL.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLEN=<SSId>,<Enable>

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier Value: 1 : only one socket is available
<Enable>	integer	0	activate/deactivate secure socket Values: 0 : deactivate 1 : activate

If the unique available secure socket is not activated, all the commands - belonging to the SSL set (example: **#SSLSECDATA**, **#SSL...**, etc.) and different from test commands - return an error message. **#SSLS** command is an exception, it can be issued also if the socket is deactivated.

If the unique available secure socket is connected, it cannot be deactivated issuing **AT#SSLEN=1,0**.

AT#SSLEN?

Not Subject to NDA

Read command reports the current status of secure socket in the format:

#SSLEN: <SSId>,<Enable>
OK

AT#SSLEN=?

Test command returns the range of supported values for all the parameters:

#SSLEN: (1),(0,1)

Not Subject to NDA

3.21.4. AT#SSLH - Close a SSL Socket

This command allows closing the SSL connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSLH=<SSId>[,<ClosureType>]

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier Value: 1 : only one socket is available
<ClosureType>	integer	0	type of socket closure. Value: 0 : only value 0 is supported

If secure socket has not be enabled through **#SSLEN** command, only test command can be used.

AT#SSLH=?

Test command returns the range of supported values for all the parameters:

#SSLH: (1),(0)

Not Subject to NDA

3.21.5. AT#SSLSEND - Send Data through a SSL Socket

This command allows sending data through a secure socket

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSLSEND=<SSId>[,<Timeout>]

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

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
	Value:		
	1 : Until now SSL block manage only one socket.		
<Timeout>	integer	100	Socket send timeout
	Value:		
	10÷5000 : hundreds of ms		

the maximum number of bytes to send is 1023; trying to send more data will cause the surplus to be discarded and lost.

if secure socket is not enabled using **AT#SSLEN** only test requests can be made.

Not Subject to NDA

- if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used.
- Before sending data through the SSL connection it has to be established using **AT#SSLD**.

AT#SSLSEND=?

Test command returns the range of supported values for all the parameters:

#SSLSEND: (1),(10-5000)

Not Subject to NDA

3.21.6. AT#SSLRECV - Read Data from a SSL Socket

This command reads data from a SSL socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSLRECV=<SSId>,<MaxNumByte>[,<Timeout>]

Set command allows to receive data, arrived through a connected secure socket. Data has been buffered and not read yet.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	secure socket identifier
	Value:		
	1 : until now only one SSL socket is supported		
<MaxNumByte>	integer	N/A	maximum number of bytes to read
	Value:		
	1÷1000 : maximum number of bytes to read		
<Timeout>	integer	100	time-out in 100 ms units
	Value:		
	1÷5000 : hundreds of ms		

Additional info:

- If data are received, the device responds:

Not Subject to NDA

```
#SSLRECV: NumByteRead
...(Data read)...

OK
```

▶▶ If no data are received, the device responds:

```
#SSLRECV: 0
TIMEOUT

OK
```

▶▶ If the remote host closes the connection, the device responds:

```
#SSLRECV: 0
DISCONNECTED

OK
```

If secure socket is not enabled using **AT#SSLEN**, only test requests can be made.

If timeout is not set for SSL connection, the default timeout value, set through **AT#SSLCFG**, is used.

Before receiving data from the SSL connection, it has to be established using **AT#SSLD**.

Not Subject to NDA

AT#SSLRECV=?

The test command returns the ranges of the parameters values in the form:

#SSLRECV: (1),(1-1000),(1-5000)

Not Subject to NDA

3.21.7. AT#SSLS - Report the Status of a SSL Socket

This command reports the status of secure sockets.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSLS=<SSId>

The command reports the status of secure sockets. The response message of the command can have the following formats:

if secure socket is connected, the format is:
#SSLS: <SSId>,<ConnectionStatus>,<CipherSuite>

otherwise:
#SSLS: <SSId>,<ConnectionStatus>

The response messages parameters are described in the Additional info section.

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier. Value: 1 : only one SSL socket is supported

Additional info:

List of the meaning of the response message parameters.

Name	Type	Default	Description
<CipherSuite>	integer	0	Cipher Suite identifier

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			In case of LE910C1-EUX/LE910C1-SAX/LE910C1-SVX/LE910Cx-WWX, refer to Note.
			Values: 0 : Chiper Suite is chosen by remote Server 1 : TLS_RSA_WITH_3DES_EDE_CBC_SHA 2 : TLS_RSA_WITH_AES_128_CBC_SHA 3 : TLS_RSA_WITH_AES_128_CBC_SHA256 4 : TLS_RSA_WITH_AES_256_CBC_SHA 5 : TLS_RSA_WITH_AES_256_CBC_SHA256 6 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA 7 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA 8 : TLS_DHE_RSA_WITH_3DES_EDE_CBC_SHA 9 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA256 10 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
<ConnectionStatus>	integer	N/A	Connection Status identifier Values: 0 : socket disabled 1 : connection closed 2 : connection open

This command can be issued even if the **<SSId>** is not enabled.

Supported CipherSuites for LE910C1-EUX/LE910C1-SAX/LE910C1-SVX/LE910Cx-WWX -

Not Subject to NDA

0 - unknown

1 - TLS_RSA_WITH_AES_128_CBC_SHA

2 - TLS_RSA_WITH_AES_128_CBC_SHA256

3 - TLS_RSA_WITH_AES_256_CBC_SHA

4 - TLS_RSA_WITH_AES_256_CBC_SHA256

5 - TLS_DHE_RSA_WITH_AES_128_CBC_SHA

6 - TLS_DHE_RSA_WITH_AES_256_CBC_SHA

7 - TLS_DHE_RSA_WITH_AES_128_CBC_SHA256

8 - TLS_DHE_RSA_WITH_AES_256_CBC_SHA256

AT#SSLS=?

Test command returns the ranges of the parameters values in format:

#SSLS: (1)

Not Subject to NDA

3.21.8. AT#SSLI - Secure Socket Info

This command is used to get information about secure socket data traffic.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLI[=<SSId>]

Execution command is used to get information about secure socket data traffic.
The response is in the format:

#SSLI:
<SSId>,<DataSent>,<DataRecv>,<PendingData>,<TCPConnWaitingAck>

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
	Value:		
	1 : only one SSL socket is available		

Additional info:

- Parameters returned by the response message and not described in the previous sections.

Name	Type	Default	Description
<DataSent>	integer	-	total amount (in bytes) of data sent to the TLS/SSL connection since the beginning of the connection itself (obviously: not yet

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			encoded into TLS/SSL record)
<DataRecv>	integer	-	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>	integer	-	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>	integer	N/A	indication of the underlying TCP socket condition, if there are TCP/IP packets sent but not yet acknowledged or not Values: 0 : no TCP/IP packets sent waiting for ack 1 : TCP/IP packets sent waiting for ack

AT#SSLI=?

Test command returns the range of supported values for all the parameters.

Not Subject to NDA

#SSLI: (1)

Not Subject to NDA

3.21.9. AT#SSLSECDATA - Manage the Security Data

The command stores, reads, and deletes security data (Certificate, CA certificate, private key) in / from NVM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLSECDATA=<SSId>,<Action>,<DataType>[,<Size>[,<Password>]]

This command allows to store, delete and read security data.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier. Value: 1 : Until now SSL block manages only one socket.
<Action>	integer	N/A	Action to do Values: 0 : delete data from NVM 1 : store data in NVM 2 : read data from NVM
<DataType>	integer	N/A	security data type Values: 0 : certificate 1 : CA certificate 2 : RSA Private key
<Size>	integer	N/A	Size of security data to be stored

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Values:

1÷4096 : for Certificate and RSA Private key

1÷12228 : for CA certificate

<Password>	string	-	it allows to read RSA key when it valids. The max length of this value is 10. Only 1~9/a~z/A~Z characters are allowed. Default is the empty string "".

Additional info:

- 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.

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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

<size> parameter is mandatory if the **<write>** action is issued, but it has to be omitted for **<delete>** or **<read>** actions are issued.

if secure socket is not enabled using **AT#SSLEN** only test requests can be made.

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- If socket is connected an error code is reported.
- in case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid **#SSLSECDATA** command.
- Once the **<Password>** saved, changing password is not allowed. To reset **<password>**, it can use **AT#SSLSECDATA=1,0,2.**
- Maximum **<size>** for Certificate/ RSA Private key is 4096 bytes. Only CA Certificate can support up to 12228 bytes in case of PEM format.

  If CA Certificate has a format to DER, it can be limited as 4096 bytes too.

  The CA certificate chain can store 1 Root CA and up to 2 Intermediate CA and it is saved in NVM memory.
- This module can be supported PKCS 1 type of RSA Private key.

AT#SSLSECDATA?

Read command reports what security data are stored in the format:

#SSLSECDATA: <SSId>,<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),(1-4096),(10)

#SSLSECDATA: (1),(0-2),(1),(1-12228),(10)

Not Subject to NDA

3.21.10. AT#SSLSECCFG2 - Configure Additional Parameters of a SSL Socket

This command allows configuring additional SSL security parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLSECCFG2=<SSId>,<version>[,<unused_A>[,<unused_B>[,<unused_C>[,<unused_D>]]]]

This command allows configuring additional SSL security parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	N/A	Secure Socket Identifier Value: 1 : Until now SSL block manage only one socket
<version>	integer	2	SSL/TLS protocol version Values: 0 : protocol version TLSv1.0 1 : protocol version TLSv1.1 2 : protocol version TLSv1.2
<unused_A>	integer	-	Reserved A
<unused_B>	integer	-	Reserved B
<unused_C>	integer	-	Reserved C
<unused_D>	integer	-	Reserved D

Not Subject to NDA

If secure socket has not be enabled through **#SSLEN** command, only test command can be used.

AT#SSLSECCFG2?

Read command reports the currently selected parameters in the format:

#SSLSECCFG2: <SSId>,<version>,0,0,0,0

AT#SSLSECCFG2=?

Test command reports the range of supported values for all the Parameters

#SSLSECCFG2: (1),(0-2),(0),(0),(0),(0)

Not Subject to NDA

3.21.11. AT#SSLSECDATAEXT - Manage the security data extended

Manage the security data extended

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#SSLSECDATAEXT=<SSId>,<Action>,<DataType>,<Index>[,<Size>]

This command allows to store, delete , read and select security data(CA certificate) into NVM.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
	Value:		
	1 : Until now SSL block manages only one socket.		
<Action>	integer	N/A	Action to do
	Values:		
	0 : Delete data from NVM		
	1 : Store data into NVM		
	2 : Read data from NVM		
	3 : Select data from NVM		
<DataType>	integer	N/A	Type of Data
	Value:		
	1 : CA Certificate		
<Index>	integer	N/A	Order to be saved
	Value:		

Not Subject to NDA

		1÷3 : Supported index range	
<Size>	integer	N/A	Size of security data to be stored Value: 1÷4096 : Supported data length

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.

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>,<Index>** parameters is shown in the following format:

#SSLSECDATAEXT: <connId>,<DataType>,<Index>

<DATA>

OK

Not Subject to NDA

If <**DataType**>, <**Index**> data has not been stored (or it has been deleted) the response has the following format:

#SSLSECDATAEXT: <connId>,<DataType>,<Index>

No data stored

OK

<size> parameter is mandatory if the **<write>** action is issued, but it has to be omitted for **<delete>** or **<read>** or **<select>** actions are issued.

if secure socket is not enabled using **AT#SSLEN** only test requests can be made.

If socket is connected an error code is reported.

Maximum supported number of CA certificate is up to 3.

To use for H/S procedure, you need to choose <Action> to 3("Select data from NVM).

No chained CA certificates are supported.

AT#SSLSECDATAEXT?

Read command reports what security data are stored in the format:

#SSLSECDATAEXT: <SSId>,<SelectedIndex>,<CAcert1Set>,< CAcert2Set >,< CAcert3Set >

< SelectedIndex >,< CAcert1Set >, < CAcert2Set >, < CAcert3Set > are 1 if related data are stored into NVM otherwise 0.

AT#SSLSECDATAEXT=?

Not Subject to NDA

Test command returns the range of supported values for all the parameters:

#SSLSECDATAEXT: (1),(0-3),(1),(1-3),(1-4096)

Not Subject to NDA

3.21.12. AT#SSLD - Open a SSL Socket to a Remote Server

This command opens a remote connection via socket secured through SSL.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier Value: 1 : Until now only one SSL socket is available
<rPort>	integer	1	Remote TCP port to contact Value: 1÷65535 : TCP port number
<IPAddress>	string	-	address of SSL server. This parameter can be either:

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			- any valid IP address in the format: "xxx.xxx.xxx.xxx" any host name to be solved with a DNS query - any valid IPv6 address in the format: "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" or "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx"
<ClosureType>	integer	0	Closure type Value: 0 : only value 0 supported
<connMode>	integer	1	connection mode Values: 0 : online mode connection 1 : command mode connection
<Timeout>	integer	100	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. Value: 10÷5000 : hundreds of ms

if secure socket is not enabled using **AT#SSLEN** only test requests can be made.

if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used.

Not Subject to NDA

- 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
- 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**.
- 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**.
- Before opening a SSL connection the GPRS context must have been activated by **AT#SGACT=x,1**.
- Before opening a SSL connection, make sure to have stored the needed secure data (CA certificate), using **AT#SSLSECDATA**.
- in case of CA Certificate already stored(for instance: SUPL), it could be possible to avoid **#SSLSECDATA** command.
- This module can be supported from at least 2048 bits of Server certificate for Public key length.

AT#SSLD=?

Test command returns the range of supported values for all the parameters:

#SSLD: (1),(1-65535),,(0),(0,1),(10-5000)

Not Subject to NDA

3.21.13. AT#SSLO - Restore a SSL Socket after a +++

This command restores a SSL connection (online mode) suspended by an escape sequence (**+++**).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSLO=<SSId>

This command restores 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>=1**).

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
	Value:		
	1 : only one socket is available.		

If secure socket has not be enabled through **#SSLEN** command, only test command can be used.

Before opening a SSL connection, the PDP context must have been activated by **AT#SGACT=X,1**.

If an error occurs during reconnection the socket cannot be reconnected, then a new connection has to be done.

AT#SSLO=?

Not Subject to NDA

Test command returns the range of supported values for all the parameters:

#SSL0: (1)

Not Subject to NDA

3.21.14. AT#SSLSENDEXT - Send Data through a SSL Socket in Command Mode

This command allows sending data through a secure socket.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#SSLSENDEXT=<SSId>,<bytestosend>[,<Timeout>]

This command allows sending data through a secure socket.

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.

Parameters:

Name	Type	Default	Description
<SSId>	integer	N/A	Secure Socket Identifier Value: 1 : Until now SSL block manage only one socket.
<bytestosend>	string	-	number of bytes to be sent. Please refer to test command for range
<Timeout>	integer	100	time-out in 100 ms units. Value: 10÷5000 : hundreds of ms.

Not Subject to NDA

If secure socket is not enabled using **#SSLEN** only test requests can be made.

if timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used.

Before sending data through the SSL connection it hasto be established using **#SSLD**.

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

#SSLSENDEXT: (1),(1-1024),(10-5000)

Not Subject to NDA

3.22. Easy Scan

3.22.1. AT#CSURV - Network Survey

The command allows to perform a network survey through band channels.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURV[= [<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel <s> to channel <e>. Issuing **AT#CSURV<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

After a while, a list of network survey information text lines, one for each received BCCH-carrier, is reported.
The format of the ending string depends on the last **#CSURVF** setting.

If **AT#CSURVF=0** or **1** the message body ends with the string:
Network survey ended

If **AT#CSURVF=2** the message body ends with the string:
Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

where:
<NoARFCN> is the number of scanned frequencies
<NoBCCH> is the number of found BCCh

The network survey information text lines parameters are described in the Additional info sections.

Parameters:

Not Subject to NDA

Name	Type	Default	Description
<s>	integer	-	starting channel
<e>	integer	-	ending channel

Additional info:

- 2G Network survey information text lines:

(For BCCH-Carrier)
arfcn: <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[<arfcn64>]] [numChannels: <numChannels> array: [<ba1> ..[<ba32>]] [pbcch: <pbcch> [nom: <nom> rac: <rac> spgc: <spgc> pat: <pat> nco: <nco> t3168: <t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh: <pcMeasCh>]]]
<CR><LF><CR><LF><CR><LF>

(For non BCCH-Carrier)
arfcn: <arfcn> rxLev: <rxLev>

Name	Type	Default	Description
<arfcn>	integer	-	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel).
<bsic>	integer	-	base station identification code; if **#CSURVF** last setting is 0, **<bsic>** is a decimal number, else it is a 2-digits octal number.
<rxLev>	integer	-	decimal number; it is the reception level (in dBm).

Not Subject to NDA

<ber>	integer	-	decimal number; it is the bit error rate (in %).
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code.
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code.
<lac>	mixed	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number.
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number.
<cellStatus>	string	N/A	string type; it is the cell status Values: 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

Not Subject to NDA

			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>	integer	-	number of valid channels in the Cell Channel Description.
<arfcnn>	integer	-	arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**)
<numChannels>	integer	-	decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last **#CSURVEXT** setting: If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx power, reselection offset, t3212 timer and so on.
<ban>	integer	-	decimal number; it is the arfcn of a valid channel in

Not Subject to NDA

			the BA list (*n* is in the range 1..<numChannels>); the output of this information for non-serving cells depends on last #CSURVEXT setting: If #CSURVEXT=0 this information is displayed only for serving cell. If #CSURVEXT=1 or 2 this information is displayed also for every valid scanned BCCH carrier. If #CSURVEXT=3 this information is displayed more information like tx power, reselection offset, t3212 timer and so on. (The following informations will be printed only if GPRS is supported in the cell)
<pbcch>	integer	N/A	packet broadcast control channel. Values: 0 : pbcch not activated on the cell 1 : pbcch activated on the cell
<nom>	integer	-	network operation mode
<rac>	integer	-	routing area code
<spgc>	integer	N/A	SPLIT_PG_CYCLE support. Values: 0 : SPLIT_PG_CYCLE is not supported on CCCH on this cell

Not Subject to NDA

			1 : SPLIT_PG_CYCLE is supported on CCCH on this cell
<pat>	integer	-	priority access threshold
<nco>	integer	-	network control order
<t3168>	integer	-	timer 3168
<t3192>	integer	-	timer 3192
<drxmax>	integer	-	discontinuous reception max time (in seconds)
<ctrlAck>	integer	-	packed control ack
<bsCVmax>	integer	-	blocked sequence countdown max value
<alpha>	integer	-	alpha parameter for power control
<pcMeasCh>	integer	N/A	type of channel which shall be used for downlink measurements for power control. Values: 0 : BCCH 1 : PDCH

▶▶ 3G Network survey information text lines:

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>

Name	Type	Default	Description

Not Subject to NDA

<uarfcn>	integer	-	The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number.
<rxLev>	integer	-	decimal number; it is the reception level (in dBm).
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code.
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code.
<scrcode>	integer	-	decimal number; it is the scrambling code.
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number.
<lac>	mixed	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number.
<cellStatus>	string	N/A	string type; it is the cell status Values: 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.

Not Subject to NDA

		CELL_LOW_LEVEL :	the cell <rxLev> is low.
		CELL_OTHER :	none of the above (e.g. exclusion timer running, no BCCH available, etc.).
<rscp>	integer	-	decimal number; it is the received signal code power (in dBm)
<ecio>	integer	-	decimal number; it is the chip energy per total wideband power (in dBm)

▶▶ 4G Network survey information text lines:

Currently work only if module camped on LTE cell.

For serving cell:

earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> cellId: <cellId> tac: <tac> phyCellId: <pci> cellStatus: <cellStatus> rsrp: <rsrp> rsrq: <rsrq> bw:<bandwidth>

For neighbor cell:

earfcn: <earfcn> rxLev: <rxLev> phyCellId: <pci> cellStatus: <cellStatus> rsrp: <rsrp> rsrq: <rsrq>

Name	Type	Default	Description
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code

Not Subject to NDA

<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 8-digits hexadecimal number
<tac>	mixed	-	Tracking Area Code. if **#CSURVF** last setting is 0, **<tac>** is a decimal number, else it is a 4-digits hexadecimal number
<pci>	mixed	-	physical cell identifier; if **#CSURVF** last setting is 0, **<pci>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	string	N/A	it is the cell status.

Values:

CELL_SUITABLE	:	C0 is a suitable cell.
CELL_LOW_PRIORITY	:	the cell is low priority based on the received system information.
CELL_FORBIDDEN	:	the cell is forbidden.
CELL_BARRED	:	the cell is barred based on the received system information.
CELL_LOW_LEVEL	:	the cell <rxLev> is low.
CELL_OTHER	:	none of the above e.g. exclusion timer running, no BCCH available... etc

Not Subject to NDA

<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<bandwidth>	integer	-	E-UTRA bandwidth of serving cell

The bandwidth, **<bandwidth>**, of LTE neighbor cells(intra/inter) cannot be appeared.

The value of **<cellId>** for LTE serving cell is replaced to cell identifier.

<pci> is added with name of phyCellId and the cellId name for neighbor cells were replaced to phyCellId.

The CELL_LOW_PRIORITY of **<cellStatus>** for LTE is not supported.

The command is executed within max. 3 minute.

Not Subject to NDA

(GSM)

at#csurv

Network survey started...

arfcn: 48 bsic: 24 rxLev: -52 ber: 0.00 mcc: 610 mnc: 1 lac: 33281 cellId: 3648 cellStatus: CELL_SUITABLE numArfcn: 2 arfcn: 30 48 numChannels: 5 array: 14 19 22 48 82

arfcn: 14 rxLev: 8

Network survey ended

OK

(WCDMA)

at#csurv

Network survey started ...

uarfcn: 10737 rxLev: -55 mcc: 450 mnc: 05 scr code: 224 cellId: 63808804 lac: 8673 cellStatus: CELL_SUITABLE rscp: -59 ecio: -4.5

uarfcn: 10836 rxLev: -68 mcc: 450 mnc: 08 scr code: 1488 cellId: 14909569 lac: 7170 cellStatus: CELL_FORBIDDEN rscp: -70 ecio: -2.5

Network survey ended

OK

(LTE)

at#csurv

Not Subject to NDA

Network survey started ...

earfcn: 2500 rxLev: -89 mcc: 450 mnc: 05 cellId: 448779 tac: 12556 phyCellId: 273 cellStatus: CELL_SUITABLE rsrp: -120 rsrq: -12 bw: 10

earfcn: 2500 rxLev: -97 phyCellId: 64 cellStatus: CELL_LOW_LEVEL rsrp: -122 rsrq: -14

earfcn: 1350 rxLev: -88 phyCellId: 64 cellStatus: CELL_SUITABLE rsrp: -111 rsrq: -14

uarfcn: 10737 rxLev: -90 mcc: 450 mnc: 05 scr code: 224 cellId: 63808804 lac: 8673 cellStatus: CELL_SUITABLE rscp: -91 ecio: -5.0

uarfcn: 10836 rxLev: -98 mcc: 450 mnc: 08 scr code: 1488 cellId: 14909569 lac: 7170 cellStatus: CELL_FORBIDDEN rscp: -101 ecio: -7.0

uarfcn: 10836 rxLev: -105 mcc: 450 mnc: 08 scr code: 5008 cellId: 14909573 lac: 7170 cellStatus: CELL_FORBIDDEN rscp: -108 ecio: -16.0

Network survey ended

OK

Not Subject to NDA

3.22.2. AT#CSURVF - Network Survey Format

The command configures the numbers format used in the messages related to the surveying of the network bands channels.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CSURVF=[<format>]

Set command configures the numbers format in each information text line of the network survey message (Easy Scan ®).

Parameter:

Name	Type	Default	Description
<format>	integer	0	format of the numbers in each network survey information text line

Values:

0 : Decimal

1 : Hexadecimal values, no text

2 : the output ends with the specific string

Additional info:

- When **<format>** is 0 or 1, the output ends with the string:

  Network survey ended

- When **<format>** is 2, the output ends with the string:

  Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

Not Subject to NDA

Where:
<NoARFCN> - number of scanned frequencies
<NoBCCH> - number of found BCCh

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**>.

Not Subject to NDA

3.22.3. AT#CSURVNLF - Network Survey CR LF Removing

This command enables/disables the automatic **<CR><LF>** removing from each network survey information text line.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CSURVNLF=[<value>]

Parameter:

Name	Type	Default	Description
<value>	integer	0	enables/disables the automatic **<CR><LF>** removing from each network survey information text line

Values:

0 : disables <CR><LF> removing; they will be present in the information text line

1 : enables <CR><LF> removing from information text line

AT#CSURVNLF?

Read command reports whether the automatic **<CR><LF>** removing from each network survey information text line is currently enabled or not, in the format:

<value>

AT#CSURVNLF=?

Test command reports the range of values for parameter **<value>**.

Not Subject to NDA

3.22.4. AT#MCSGS - Manual Closed Subscriber Group Search

This command used to request Manual CSG Search.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MCSGS

Execution command used to request Manual CSG Search.

If CSG search launched successfully returns **OK**.

- if module registered on VPLMN return error: "operation not supported"
- if previous powerup/periodic/manual CSG search didn't finished yet return error: "wrong state"
- if used inappropriate SIM or file EFCSGL empty return error: "SIM wrong"
- periodic CSG search run every 125 min (or 125 min after last successful manual CSG search)

AT#MCSGS?

Read command reports the state of CSG search and CSG registration.

Additional info:

- **#MCSGS:<CSG_search_state>,<CSG_registration_state>**

Name	Type	Default	Description
<CSG_search_state>	integer	N/A	

Not Subject to NDA

		Values: 0 : No active CSG search 1 : power-up CSG search 2 : periodic CSG search 3 : manual CSG search
<CSG_registration_state>	integer	N/A Values: 0 : inactive CSG registration 1 : active CSG registration

Not Subject to NDA

3.22.5. AT#CSURVEXT - Extended Network Survey

This command enables/disables extended network survey.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#CSURVEXT[=<value>]

Parameter:

Name	Type	Default	Description
<value>	integer	0	enables/disables the automatic <CR><LF> removing from each network survey information text line

Values:

0 : disables extended network survey

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 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

Not Subject to NDA

#CSURVEXT configuration has effect on 2G cells only.

AT#CSURVEXT?

Read command reports whether automatic <CR><LF> removing is currently enabled or not, in the format:

<value>

AT#CSURVEXT=?

Test command reports the range of values for dummy parameter <**value**>.

Not Subject to NDA

3.22.6. AT#CSURVC - Network Survey (Numeric Format)

This command allows to perform a network survey through band channels with output in numeric format.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVC[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVC<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

After a while, a list of network survey information text lines, one for each received BCCH-carrier, is reported.
The format of the ending string depends on the last **#CSURVF** setting.

If **AT#CSURVF=0** or **1** the message body ends with the string:
Network survey ended

If **AT#CSURVF=2** the message body ends with the string:
Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

where:
<NoARFCN> is the number of scanned frequencies
<NoBCCH> is the number of found BCCh

The network survey information text lines parameters are described in the Additional info sections.

Parameters:

Name	Type	Default	Description

Not Subject to NDA

<s>	integer	-	starting channel
<e>	integer	-	ending channel

Additional info:

▶▶2G Network survey information text lines:

(For BCCH-Carrier)

arfcn: <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[<arfcn64>]] [numChannels: <numChannels> array: [<ba1> ..[<ba32>]] [pbcch: <pbcch> [nom: <nom> rac: <rac> spgc: <spgc> pat: <pat> nco: <nco> t3168: <t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh: <pcMeasCh>]]]
<CR><LF><CR><LF><CR><LF>

(For non BCCH-Carrier)
arfcn: <arfcn> rxLev: <rxLev>

Name	Type	Default	Description
<arfcn>	integer	-	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel).
<bsic>	integer	-	base station identification code; if **#CSURVF** last setting is 0, **<bsic>** is a decimal number, else it is a 2-digits octal number.
<rxLev>	integer	-	decimal number; it is the receiption level (in dBm).
<ber>	integer	-	decimal number; it is the bit error rate (in %).
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code.

Not Subject to NDA

<mnc>	hex	-	hexadecimal 2-digits/3-digits number; it is the mobile network code.
<lac>	mixed	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number.
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, <**cellId**> is a decimal number, else it is a 4-digits hexadecimal number
<cellStat>	string	N/A	string type; it is the cell status Values: 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>	integer	-	number of valid channels in the Cell Channel Description.
<arfcnn>	integer	-	arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**)
<numChannels>	integer	-	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:

Not Subject to NDA

			If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx power, reselection offset, t3212 timer and so on.
<ban>	integer	-	decimal number; it is the arfcn of a valid channel in the BA list (*n* is in the range **1..<numChannels>**); the output of this information for non-serving cells depends on last **#CSURVEXT** setting: Iif **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx power, reselection offset, t3212 timer and so on. (The following informations will be printed only if GPRS is supported in the cell)
<pbcch>	integer	N/A	packet broadcast control channel. Values: 0 : pbcch not activated on the cell 1 : pbcch activated on the cell
<nom>	integer	-	network operation mode
<rac>	integer	-	routing area code

Not Subject to NDA

<spgc>	integer	N/A	SPLIT_PG_CYCLE support Values: 0 : SPLIT_PG_CYCLE is not supported on CCCH on this cell 1 : SPLIT_PG_CYCLE is supported on CCCH on this cell
<pat>	integer	-	priority access threshold
<nco>	integer	-	network control order.
<t3168>	integer	-	timer 3168
<t3192>	integer	-	timer 3192
<drxmax>	integer	-	discontinuous reception max time (in seconds)
<ctrlAck>	integer	-	packed control ack.
<bsCVmax>	integer	-	blocked sequence countdown max value.
<alpha>	integer	-	alpha parameter for power control.
<pcMeasCh>	integer	N/A	type of channel which shall be used for downlink measurements for power control. Values: 0 : BCCH 1 : PDCH

▶▶3G Network survey information text lines:

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

Not Subject to NDA

Name	Type	Default	Description
<uarfcn>	integer	-	the cell carrier frequency designated by UTRA Absolute Radio Frequency Channel Number
<rxLev>	integer	-	decimal number; it is the receiption level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2-digits/3-digits number; it is the mobile network code
<scrcode>	integer	-	decimal number; it is the scrambling code
<cellId>	integer	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 8-digits hexadecimal number
<lac>	integer	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStat>	string	N/A	string type; it is the cell status Values: 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).

Not Subject to NDA

			5 : none of the above (e.g. exclusion timer running, no BCCH available,etc.) (CELL_OTHER).
<rscp>	integer	-	decimal number; it is the RSCP level (in dBm)
<ecio>	integer	-	decimal number; it is the EC/IO ratio level (in dB)

▶▶4G Network survey information text lines:

Currently work only if module camped on LTE cell.

For serving cell:

<earfcn>,<rxLev>,<mcc>,<mnc>,<cellId>,<tac>,<pci>,<cellStatus>,<rsrp>,<rsrq>,<bandwidth>

For neighbor cell:

<earfcn>,<rxLev>,<pci>,<cellStatus>,<rsrp>,<rsrq>

Name	Type	Default	Description
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 8-digits hexadecimal number

Not Subject to NDA

<tac>	mixed	-	Tracking Area Code. if **#CSURVF** last setting is 0, **<tac>** is a decimal number, else it is a 4-digits hexadecimal number
<pci>	mixed	-	physical cell identifier; if **#CSURVF** last setting is 0, **<pci>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	integer	N/A	it is the cell status Values: 0 : C0 is a suitable cell (CELL_SUITABLE). 1 : the cell is low priority based on the received system information (CELL_LOW_PRIORITY). 2 : the cell is forbidden (CELL_FORBIDDEN). 3 : the cell is barred based on the received system information (CELL_BARRED). 4 : the cell <rxLev> is low (CELL_LOW_LEVEL). 5 : none of the above e.g. exclusion timer running, no BCCH available...etc.. (CELL_OTHER).
<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<bandwidth>	integer	-	E-UTRA bandwidth of serving cell

The bandwidth, **<bandwidth>**, of LTE neighbor cells(intra/inter) cannot be appeared.

The value of **<cellId>** for LTE serving cell is replaced to cell identifier.

<pci> is added with name of phyCellId and the cellId name for neighbor cells were replaced to phyCellId.

Not Subject to NDA

- The CELL_LOW_PRIORITY of **<cellStatus>** for LTE is not supported.
- The command is executed within max. 3 minute.
- The information provided by **#CSURVC** is the same as that provided by **#CSURV**. The difference is that the output of **#CSURVC** is in numeric format only.

at#csurvc

Network survey started ...

2500,-92,450,05,448779,12556,273,4,-122,-10,10

2500,-99,64,4,-122,-13

1350,-85,64,0,-110,-15

10737,-91,450,05,224,63808804,8673,4,-92,-5.0

10836,-104,450,08,1488,14909569,7170,2,-104,-9.0

Network survey ended

OK

Not Subject to NDA

3.22.7. AT#CSURVW - Network Survey with only WCDMA

The command allows to perform a network survey through band channels with only WCDMA.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	180 s	2

AT#CSURVW[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVW<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of information, one for each received carrier, is reported.

The **#CSURVW** 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

Parameters:

Not Subject to NDA

Name	Type	Default	Description
<s>	integer	-	starting channel
<e>	integer	-	ending channel

Additional info:

- **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>

Name	Type	Default	Description
<uarfcn>	integer	-	The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<scrcode>	integer	-	decimal number; it is the scrambling code
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number
<lac>	mixed	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number

Not Subject to NDA

<cellStatus>	string	N/A	string type; it is the cell status Values: 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.)
<rscp>	integer	-	decimal number; it is the received signal code power (in dBm)
<ecio>	integer	-	decimal number; it is the chip energy per total wideband power (in dBm)

The command is executed within max 3 minutes.

Not Subject to NDA

3.22.8. AT#CSURVUC - Network Survey of User Defined Channels (Numeric Format)

This command allows performing a quick survey through the given channels.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVUC=[<ch1>[,...[,<chN>]]]

Set command allows performing a quick survey through the given channels. The range of available channels depends on the last **#BND** issue.

The result format is like command **#CSURVC**.

In 4G (partly implemented)

Currently work only if module camped on LTE cell.

Parameter:

Name	Type	Default	Description
<ch1>...<chN>	integer	-	channel number (ARFCN (in case of 2G), UARFCN (in case of 3G), EARFCN (in case of 4G)) Max value of N is 10.

the <chn> must be selected in same RAT.

The command is executed within max. 2 minute.

The information provided by **#CSURVUC** is the same as that provided by **#CSURVU**. The difference is that the output of **#CSURVUC** is in numeric format only.

Not Subject to NDA

at#csurvuc=275

Network survey started ...

275,-65,450,05,7321443,12556,99,0,-97,-12,15

Network survey ended

OK

Not Subject to NDA

3.22.9. AT#CSURVU - Network Survey of User Defined Channels

This command allows performing a quick survey through the given channels.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVU=[<ch1>[,...[,<chN>]]]

Set command allows performing a quick survey through the given channels. The range of available channels depends on the last **#BND** issue.

The result format is like command **#CSURV**.

In 4G (partly implemented)

Currently work only if module camped on LTE cell.

Parameter:

Name	Type	Default	Description
<ch1>...<chN>	integer	-	channel number (ARFCN (in case of 2G), UARFCN (in case of 3G), EARFCN (in case of 4G)) Max value of N is 10.

the <chn> must be selected in same RAT.

The command is executed within max. 2 minute.

Not Subject to NDA

at#csurvu=2500

Network survey started ...

earfcn: 2500 rxLev: -50 mcc: 450 mnc: 05 cellId: 7323679 tac: 12556 phyCellId: 64 cellStatus: CELL_SUITABLE rsrp: -82 rsrq: -14 bw: 10

earfcn: 2500 rxLev: -56 phyCellId: 99 cellStatus: CELL_SUITABLE rsrp: -82 rsrq: -16

Network survey ended

OK

Not Subject to NDA

3.22.10. AT#CSURVBC - BCCH Network Survey (Numeric Format)

This command performs a quick network survey.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVBC=[<n>]

Set command performs a quick network survey through **M** (maximum number of available frequencies depending on last selected band and RAT) channels. The survey stops as soon as **<n>** BCCH carriers are found.

The result is given in numeric format and is like command **#CSURVC**.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	number of desired BCCH carriers Value: 1÷M : M is the maximum.

AT#CSURVBC=?

Test command reports the range of values for parameter **<n>** in the format:

(1-M)

where **M** is the maximum.

If it is in no service or LTE RAT service, it returns OK.

Not Subject to NDA

3.22.11. AT#CSURVP - PLMN Network Survey

This command performs a quick network survey through channels.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVP=<plmn>

Set command performs a quick network survey through channels.

The survey stops as soon as a BCCH carriers belonging to the selected PLMN is found.

The result format is like command **#CSURV**.

Parameter:

Name	Type	Default	Description
<plmn>	integer	N/A	the desired PLMN in numeric format.
	Value:		
	plmn : PLMN		

AT#CSURVP=?

Test command returns OK.

Not Subject to NDA

3.22.12. AT#CSURVB - BCCH Network Survey

This command performs a quick network survey.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVB=[<n>]

Set command performs a quick network survey through M (maximum number of available frequencies depending on last selected band and RAT) channels. The survey stops as soon as **<n>** BCCH carriers are found.

The result format is like command **#CSURV**.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	number of desired BCCH carriers
	Value:		
	1÷M :	M is the maximum.	

AT#CSURVB=?

Test command reports the range of values for parameter **<n>** in the format:

(1-M)

where **M** is the maximum.

If it is in no service or LTE RAT service, it returns OK.

Not Subject to NDA

3.22.13. AT#CSURVPC - PLMN Network Survey (Numeric Format)

This command performs a quick network survey through channels.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	-	2

AT#CSURVPC=<plmn>

Set command performs a quick network survey through channels.

The survey stops as soon as a BCCH carriers belonging to the selected PLMN is found.

The result is given in numeric format and is like command **#CSURVC**.

Parameter:

Name	Type	Default	Description
<plmn>	integer Value: plmn : PLMN	N/A	the desired PLMN in numeric format.

AT#CSURVPC=?

Test command returns OK.

Not Subject to NDA

3.22.14. AT#CSURVL - Network Survey with only LTE

The command allows to perform a network survey through band channels with only LTE.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	180 s	2

AT#CSURVL[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVL<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of information, one for each received carrier, is reported.

The **#CSURVL** 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

Parameters:

Name	Type	Default	Description

Not Subject to NDA

<s>	integer	-	starting channel
<e>	integer	-	ending channel

Additional info:

- Currently work only if module camped on LTE cell.

  For serving cell or other carrier cells:

  earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> cellId: <cellId> tac: <tac> phyCellId: <pci> cellStatus: <cellStatus> rsrp: <rsrp> rsrq: <rsrq> bw: <bandwidth>

  For neighbor cell:

  earfcn: <earfcn> rxLev: <rxLev> phyCellId: <pci> cellStatus: <cellStatus> rsrp: <rsrp> rsrq: <rsrq>

Name	Type	Default	Description
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 8-digits hexadecimal number
<tac>	mixed	-	Tracking Area Code. if **#CSURVF** last setting is 0, **<tac>** is a decimal number, else it is a 4-digits hexadecimal number
<pci>	mixed	-	physical cell identifier; if **#CSURVF** last setting is 0, **<pci>**

Not Subject to NDA

			is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	string	N/A	it is the cell status Values: CELL_SUITABLE : C0 is a suitable cell CELL_LOW_PRIORITY : the cell is low priority based on the received system information CELL_FORBIDDEN : the cell is forbidden CELL_BARRED : the cell is barred based on the received system information CELL_LOW_LEVEL : the cell <rxLev> is low CELL_OTHER : none of the above e.g. exclusion timer running, no BCCH available...etc
<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<bandwidth>	integer	-	E-UTRA bandwidth of serving cell

The value of **<bandwidth>** for LTE neighbor cells(intra/inter) of same PLMN cannot be appeared.

The CELL_LOW_PRIORITY of **<cellStatus>** for LTE is not supported.

The command is executed within max 3 minutes.

Not Subject to NDA

Not Subject to NDA

3.22.15. AT#CSURVCL - Network Survey with only LTE (Numeric Format)

The command allows to perform a network survey through band channels with only LTE.(Numeric Format)

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	180 s	2

AT#CSURVCL[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVCL<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of information, one for each received carrier, is reported.

The **#CSURVCL** 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

Parameters:

Name	Type	Default	Description
<s>	integer	-	starting channel

Not Subject to NDA

<e>	integer	-	ending channel

Additional info:

For serving cell or other carrier cells:

<earfcn>,<rxLev>,<mcc>,<mnc>,<cellId>,<tac>,<pci>,<cellStatus>,<rsrp>,<rsrq>,<bandwidth>

For neighbor cell:

<earfcn>,<rxLev>,<pci>,<cellStatus>,<rsrp>,<rsrq>

Name	Type	Default	Description
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 8-digits hexadecimal number
<tac>	mixed	-	Tracking Area Code. if **#CSURVF** last setting is 0, **<tac>** is a decimal number, else it is a 4-digits hexadecimal number
<pci>	mixed	-	physical cell identifier; if **#CSURVF** last setting is 0, **<pci>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	integer	N/A	it is the cell status Values: 0 : C0 is a suitable cell (CELL_SUITABLE).

Not Subject to NDA

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).

<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<bandwidth>	integer	-	E-UTRA bandwidth of serving cell

The value of **<bandwidth>** for LTE neighbor cells(intra/inter) of same PLMN cannot be appeared.

The CELL_LOW_PRIORITY of **<cellStatus>** for LTE is not supported.

The command is executed within max 3 minutes.

The information provided by **#CSURVCL** is the same as that provided by **#CSURVL**. The difference is that the output of **#CSURVCL** is in numeric format only.

Not Subject to NDA

3.22.16. AT#CSURVCW - Network Survey with only WCDMA (Numeric Format)

The command allows to perform a network survey through band channels with only WCDMA (Numeric Format).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	180 s	2

AT#CSURVCW[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVCW<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of information, one for each received carrier, is reported.

The **#CSURVCW** 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

Parameters:

Name	Type	Default	Description
<s>	integer	-	starting channel

Not Subject to NDA

<e>	integer	-	ending channel

Additional info:

▶▶ **<uarfcn>,<rxLev>,<mcc>,<mnc>,<scrcode>,<cellId>,<lac>,<cellStatus>,<rscp>,<ecio>**

<CR><LF><CR><LF><CR><LF>

Name	Type	Default	Description
<uarfcn>	integer	-	The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<scrcode>	integer	-	decimal number; it is the scrambling code
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number
<lac>	mixed	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	integer	0	decimal number; it is the cell status Values: 0 : the cell is a suitable cell (CELL_SUITABLE) 1 : the cell is low priority based on the received system information (CELL_LOW_PRIORITY)

Not Subject to NDA

			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)
<rscp>	integer	-	decimal number; it is the received signal code power (in dBm)
<ecio>	integer	-	decimal number; it is the chip energy per total wideband power (in dBm)

The command is executed within max 3 minutes.

The information provided by **#CSURVCW** is the same as that provided by **#CSURVW**. The difference is that the output of **#CSURVCW** is in numeric format only.

Not Subject to NDA

3.22.17. AT#CSURVG - Network Survey with only GSM

The command allows to perform a network survey through band channels with only GSM.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	180 s	2

AT#CSURVG[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVG<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of information, one for each received carrier, is reported.

The **#CSURVG** 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

Parameters:

Not Subject to NDA

Name	Type	Default	Description
<s>	integer	-	starting channel
<e>	string	-	ending channel

Additional info:

- (For BCCH-Carrier)

  arfcn: <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc> lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn: [<arfcn1> ..[<arfcn64>]] [numChannels: <numChannels> array: [<ba1> ..[<ba32>]] [pbcch: <pbcch> [nom: <nom> rac: <rac> spgc: <spgc> pat: <pat> nco: <nco> t3168: <t3168> t3192: <t3192> drxmax: <drxmax> ctrlAck: <ctrlAck> bsCVmax: <bsCVmax> alpha: <alpha> pcMeasCh: <pcMeasCh>]]]

  <CR><LF><CR><LF><CR><LF>

  (For non BCCH-Carrier)
  arfcn: <arfcn> rxLev: <rxLev>

Name	Type	Default	Description
<arfcn>	integer	-	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel)
<bsic>	integer	-	base station identification code; if **#CSURVF** last setting is 0, **<bsic>** is a decimal number, else it is a 2-digits octal number
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<ber>	integer	-	decimal number; it is the bit error rate (in %)

Not Subject to NDA

<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<lac>	mixed	-	location area code; if **#CSURVF** last setting is 0, **<lac>** is a decimal number, else it is a 4-digits hexadecimal number
<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	string	N/A	string type; it is the cell status Values: 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

Not Subject to NDA

			CELL_LOW_LEVEL : the cell <rxLev> is low CELL_OTHER : none of the above (e.g. exclusion timer running, no BCCH available, etc.)
<numArfcn>	integer	-	number of valid channels in the Cell Channel Description
<arfcnn>	integer	-	arfcn of a valid channel in the Cell Channel Description (*n* is in the range 1..**<numArfcn>**)
<numChannels>	integer	-	decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last **#CSURVEXT** setting: If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx power, reselection offset, t3212 timer and so on.
<ban>	integer	-	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

Not Subject to NDA

			non-serving cells depends on last **#CSURVEXT** setting: If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx power, reselection offset, t3212 timer and so on. (The following informations will be printed only if GPRS is supported in the cell)
<pbcch>	integer	0	packet broadcast control channel Values: 0 : pbcch not activated on the cell 1 : pbcch activated on the cell
<nom>	integer	-	network operation mode
<rac>	integer	-	routing area code
<spgc>	integer	N/A	SPLIT_PG_CYCLE support Values: 0 : SPLIT_PG_CYCLE is not supported on CCCH on this cell 1 : SPLIT_PG_CYCLE is supported on CCCH on this cell

Not Subject to NDA

<pat>	integer	-	priority access threshold
<nco>	integer	-	network control order
<t3168>	integer	-	timer 3168
<t3192>	integer	-	timer 3192
<drxmax>	integer	-	discontinuous reception max time (in seconds)
<ctrlAck>	integer	-	packed control ack
<bsCVmax>	integer	-	blocked sequence countdown max value
<alpha>	integer	-	alpha parameter for power control
<pcMeasCh>	integer	N/A	type of channel which shall be used for downlink measurements for power control Values: 0 : BCCH 1 : PDCH

The command is executed within max 3 minutes.

Not Subject to NDA

3.22.18. AT#CSURVCG - Network Survey with only GSM (Numeric Format)

The command allows to perform a network survey through band channels with only GSM (Numeric Format).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	Yes	180 s	2

AT#CSURVCG[=[<s>,<e>]]

Execution command allows to perform a quick survey through channels belonging to the band selected by last **#BND** command issue, starting from channel **<s>** to channel **<e>**. Issuing **AT#CSURVCG<CR>**, a full band scan is performed.

After issuing the command the device responds with the string:

Network survey started...

and, after a while, a list of information, one for each received carrier, is reported.

The **#CSURVCG** 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

Parameters:

Name	Type	Default	Description
<s>	integer	-	starting channel

Not Subject to NDA

<e>	integer	-	ending channel

Additional info:

▶▶(For BCCH-Carrier)

<arfcn>,<bsic>,<rxLev>,<ber>,<mcc>,<mnc>,<lac>,<cellId>, <cellStatus>,<numArfcn>[,<arfcn1> ..[<arfcn64>]] [,<numChannels>[,<ba1> ..[<ba32>]][,<pbcch>[,<nom>,<rac>,<spgc> <pat> <nco> <t3168> <t3192> <drxmax> <ctrlAck> <bsCVmax>,<alpha>,<pcMeasCh>]]]

<CR><LF><CR><LF><CR><LF>

(For non BCCH-Carrier)

arfcn: <arfcn> rxLev: <rxLev>

Name	Type	Default	Description
<arfcn>	integer	-	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel)
<bsic>	integer	-	base station identification code; if #CSURVF last setting is 0, <bsic> is a decimal number, else it is a 2-digits octal number
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<ber>	integer	-	decimal number; it is the bit error rate (in %)
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2/3 digits number; it is the mobile network code
<lac>	mixed	-	location area code; if #CSURVF last setting is 0, <lac> is a decimal number, else it is a 4-digits hexadecimal number

Not Subject to NDA

<cellId>	mixed	-	cell identifier; if **#CSURVF** last setting is 0, **<cellId>** is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	integer	0	decimal number; it is the cell status Values: 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>	integer	-	number of valid channels in the Cell Channel Description
<arfcnn>	integer	-	arfcn of a valid channel in the Cell Channel Description (*n* is in the range **1..<numArfcn>**)
<numChannels>	integer	-	decimal number; it is the number of valid channels in the BCCH Allocation list; the output of this information for non-serving cells depends on last **#CSURVEXT** setting: If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx

Not Subject to NDA

			power, reselection offset, t3212 timer and so on.
<ban>	integer	-	decimal number; it is the arfcn of a valid channel in the BA list (*n* is in the range **1..<numChannels>**); the output of this information for non-serving cells depends on last **#CSURVEXT** setting: If **#CSURVEXT=0** this information is displayed only for serving cell. If **#CSURVEXT=1** or **2** this information is displayed also for every valid scanned BCCH carrier. If **#CSURVEXT=3** this information is displayed more information like tx power, reselection offset, t3212 timer and so on. (The following informations will be printed only if GPRS is supported in the cell)
<pbcch>	integer	N/A	packet broadcast control channel Values: 0 : pbcch not activated on the cell 1 : pbcch activated on the cell
<nom>	integer	-	network operation mode
<rac>	integer	-	routing area code
<spgc>	integer	N/A	SPLIT_PG_CYCLE support Values: 0 : SPLIT_PG_CYCLE is not supported on CCCH on this cell 1 : SPLIT_PG_CYCLE is supported on CCCH on this cell

Not Subject to NDA

<pat>	integer	-	priority access threshold
<nco>	integer	-	network control order
<t3168>	integer	-	timer 3168
<t3192>	integer	-	timer 3192
<drxmax>	integer	-	discontinuous reception max time (in seconds)
<ctrlAck>	integer	-	packed control ack
<bsCVmax>	integer	-	blocked sequence countdown max value
<alpha>	integer	-	alpha parameter for power control
<pcMeasCh>	integer	N/A	type of channel which shall be used for downlink measurements for power control Values: 0 : BCCH 1 : PDCH

The command is executed within max 3 minutes.

The information provided by **#CSURVCG** is the same as that provided by **#CSURVG**. The difference is that the output of **#CSURVCG** is in numeric format only.

Not Subject to NDA

3.23. AT Run

3.23.1. AT#SMSATRUN - Enable SMS Run AT Service

This command enables/disables the SMS AT RUN service.

Telit Running AT Commands Remotely Application Note, 80000NT10029a

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SMSATRUN=<mod>

Set command enables/disables the SMS AT RUN service.

Parameter:

Name	Type	Default	Description
<mod>	integer	0	enables/disables the SMS AT RUN service Values: 0 : Service Disabled 1 : Service Enabled

When the service is active on a specific AT instance (see **#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.

AT#SMSATRUN?

Not Subject to NDA

Read command returns the current settings of <**mode**> and the value of <**stat**> in the format:

#SMSATRUN: <mod>,<stat>

Additional info:

- Parameters returned by the Read command and not described in the previous sections.

Name	Type	Default	Description
<stat>	string	0	service status
	Values: 0 : not active 1 : active		

AT#SMSATRUN=?

Test command returns the supported values of parameter <**mod**>.

By default, the SMS ATRUN service is disabled. It can be activated either by the command **#SMSATRUN** or receiving a special SMS that can be sent from a Telit server.

Not Subject to NDA

3.23.2. AT#SMSATRUNCFG - Set SMS Run AT Service Parameters

This command configures the SMS AT RUN service.

Telit Running AT Commands Remotely Application Note, 80000NT10029a

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SMSATRUNCFG=<instance>[,<urcmod>[,<timeout>]]

Set command configures the SMS AT RUN service.

Parameters:

Name	Type	Default	Description
<instance>	integer	3	AT instance that will be used by the service to run the AT Command Value: 1÷3 : AT instance
<urcmod>	integer	1	enable/disable unsolicited. Values: 0 : disable unsolicited message 1 : enable an unsolicited message when an AT command is requested via SMS
<timeout>	integer	5	It defines in minutes the maximum time for a command execution. If timeout expires the module will be rebooted. Value: 1÷60 : Range in minutes

Not Subject to NDA

Unsolicited field:

Name	Type	Description
<text>	string	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.

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.

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 vice versa.

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.

Not Subject to NDA

3.23.3. AT#SMSATWL - SMS AT Run White List

This command adds, deletes, prints an element of the white list.

Telit Running AT Commands Remotely Application Note, 80000NT10029a

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#SMSATWL=<action>,<index>[,<entryType>[,<string>]]

Set command manages the whitelist.

Parameters:

Name	Type	Default	Description
<action>	integer	0	identifies the action on the white list. Values: 0 : add an element to the white list 1 : delete an element from the white list 2 : print and element of the white list
<index>	integer	N/A	index of the white list Value: 1÷8 : index values
<entryType>	integer	N/A	type of entry Values: 0 : phone number 1 : password

Not Subject to NDA

<string>	string	-	string parameter enclosed between double quotes containing 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.

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 users having the Service Provider identified by 349 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 parameters <**action**>, <**index**> and <**entryType**>.

The command will return **ERROR** if executed using **SMSATRUN** digest mode or **TCPATRUN** server mode.

Not Subject to NDA

3.23.4. AT#TCPATRUNCFG - Set TCP AT Run Service Parameters

This command configures the TCP AT RUN service Parameters.

Telit Running AT Commands Remotely Application Note, 80000NT10029a

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#TCPATRUNCFG=<connId>,<instance>,<tcpPort>,<tcpHostPort>,<tcpHost>[,<urcmod> [,<timeout>[,<authMode>[,<retryCnt>[,<retryDelay>]]]]]

Set command configures the TCP AT RUN service.

Parameters:

Name	Type	Default	Description
<connId>	integer	1	socket connection identifier Value: 1÷conMax : Socket connection identifier. conMax value is returned by test command.
<instance>	integer	2	AT instance that will be used by the service to run the AT Command Value: 1÷3 : AT instance
<tcpPort>	integer	1024	TCP Listen port for the connection to the service in server mode Value: 1÷65535 : TCP Listen port

Not Subject to NDA

<tcpHostPort>	integer	1024	TCP remote port of the Host to connect to, in client mode Value: 1÷65535 : Tcp remote port
<tcpHost>	string	-	IP address of the Host. The parameter can be either: 46. any valid IP address in the format: "xxx.xxx.xxx.xxx" 47. any host name to be solved with a DNS query 48. "" is default value
<urcmod>	integer	1	enables/disables URC messages (Refer to additional info for more detail) Values: 0 : disable unsolicited messages 1 : enable an unsolicited message when the TCP socket is connected or disconnect
<timeout>	string	5	Define in minutes the maximum time for a command execution. If timeout expires the module will be rebooted Value: 1÷5 : minutes of maximum time for a command execution
<authMode>	integer	0	determines the authentication procedure in server mode Values: 0 : When connection is up, username and password (in this order and each of them

Not Subject to NDA

			followed by a Carriage Return) must 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 successful" will close authentication phase.
<retryCnt>	integer	0	in client mode, at boot or after a socket disconnection, this parameter represents the number of attempts that are made to re-connect to the Host. Value: 0÷5 : the number of attempts
<retryDelay>	integer	2	in client mode, delay between one attempt and the other Value: 1÷3600 : delay in minutes

Unsolicited field:

Name	Type	Description
<urcmod>	integer	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.

Not Subject to NDA

- if username and/or password are not allowed (see **AT#TCPATRUNAUTH**) the connection will close immediately.
- the current settings are stored in NVM.
- to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command).
- 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

Not Subject to NDA

3.23.5. AT#TCPATRUNFRWL - TCP AT Run Firewall List

This command controls the internal firewall settings for the TCPATRUN connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#TCPATRUNFRWL=<action>,<ip_addr>,<net_mask>

Set command controls the internal firewall settings for the TCPATRUN connection.

Parameters:

Name	Type	Default	Description
<action>	integer	N/A	command action Values: 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>	string	-	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>	string	-	mask to be applied on the <ip_addr>. Refer to additional info for more detail.

Additional info:

- **<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.

Not Subject to NDA

Firewall general policy is DROP, therefore all packets that are not included into an ACCEPT chain rule will be silently discarded.

When a packet comes from the IP address incoming_IP, the firewall chain rules will be scanned for matching with the following criteria:

incoming_IP & <net_mask> = <ip_addr> & <net_mask>

If a criterion is matched, then the packet is accepted and the rule scan is finished; if a criterion is not matched for any chain the packet is silently dropped.

A maximum of 5 firewalls can be present at same time in the List.

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**>.

Not Subject to NDA

3.23.6. AT#TCPATRUNAUTH - TCP AT Run Authentication Parameters List

This command manages the authentication parameters for the TCPATRUN connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#TCPATRUNAUTH=<action>,<userid>,<passw>

Execution command controls the authentication parameters for the TCPATRUN connection.

Parameters:

Name	Type	Default	Description
<action>	integer	N/A	command action Values: 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>	string	-	username to be added into the **ACCEPT** chain. The maximum parameter permitted length is 50 characters.
<passw>	string	-	password of the user on the **<userid>**. The maximum parameter permitted length is 50 characters.

A maximum of 3 entries (password and userid) can be present at same time in the list.

Not Subject to NDA

AT#TCPATRUNAUTH?

Read command reports the list of all **ACCEPT** chain rules, registered in the Authentication Parameters settings, in the format:

#TCPATRUNAUTH: <userid>,<passw>
#TCPATRUNAUTH: <userid>,<passw>
...

OK

AT#TCPATRUNAUTH=?

Test command returns the allowed values for parameter **<action>**.

Not Subject to NDA

3.23.7. AT#TCPATRUND - TCP AT Run in Dial (Client) Mode

The command enables/disables the TCPATRUN service in client mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#TCPATRUND=<mod>

Set command enables/disables the TCPATRUN service in client mode. When this service is enabled, the module tries to open a connection to the Host (the Host is specified in **#TCPATRUNCFG**).

Parameter:

Name	Type	Default	Description
<mod>	integer	0	TCPATRUN service mode. Values: 0 : Service disabled 1 : Service enabled

to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command).

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.**

while the TCP Run AT service executes a command that takes long time to get the response, a new command will be pending until the module has finished sending all of its response result code.

Not Subject to NDA

AT#TCPATRUND?

Read command returns the current settings of <**mode**> and the value of <**stat**> in the format:

#TCPATRUND: <**mod**>,<**stat**>

Additional info:

- <**stat**> parameter description

Name	Type	Default	Description
<stat>	integer	N/A	connection status.

Values:

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.

Not Subject to NDA

3.23.8. AT#TCPATRUNCLOSE - Closes TCP Run AT Socket

Execution command that closes TCPATRUN connection

Telit Running AT Commands Remotely Application Note, 80000NT10029a

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#TCPATRUNCLOSE

Closes the socket used by TCPATRUN connection.

TCPATRUN status is still enabled after this command, so the service re-starts automatically.

AT#TCPATRUNCLOSE=?

Test command returns **OK**

Not Subject to NDA

3.23.9. AT#TCPATCMDSEQ - TCP AT Run Command Sequence

This command enables/disables, for TCP Run AT service, a feature that allows giving more than one AT command without waiting for responses.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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”, “at#semail”**)

Parameter:

Name	Type	Default	Description
<mod>	integer	0	current mode for TCP Run AT feature for multiple commands Values: 0 : service disabled 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.

Not Subject to NDA

Not Subject to NDA

3.23.10. AT#TCPATCONSER - TCP AT Run Service on Serial Port

This command sets the TCP Run AT in transparent mode, in order to have direct access to the serial port specified.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#TCPATCONSER=<port>,<rate>

Set command sets the TCP Run AT in transparent mode, in order to have direct access to the serial port specified. Data will be transferred directly, without being elaborated, between the TCP Run AT service and the serial port specified.

Parameters:

Name	Type	Default	Description
<port>	integer	0	identifies the serial port Values: 0 : UART 1 : USB1 2 : USB2
<rate>	string	-	baud rate for data transfer. Allowed values are 300,1200, 2400,4800,9600,19200,38400,57600,115200.

Additional info:

- **< port >**

  Not all of these ports will be available at the same time.

  The port available will be displayed by the test command.

Not Subject to NDA

- the command has to be issued from the TCP ATRUN instance.
- 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.
- to exit from online mode and close the connection, the escape sequence (+++) has to be sent on the TCP ATRUN instance.

  The escape sequence needs to be sent in one single packet.

  The use of Telnet for Windows sending every single byte in a TCP packet is not appropriate to perform this connection.

AT#TCPATCONSER=?

Test command returns the supported values for the **TCPATCONSER** parameters.

Not Subject to NDA

3.23.11. AT#ATRUNDELAY - Set the Delay on Run AT Command Execution

It has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#ATRUNDELAY=<srv>,<delay>

It has no effect and is included only for backward compatibility.

Parameters:

Name	Type	Default	Description
<srv>	integer	0	service affected by the configuration Values: 0 : TCP Run AT service 1 : SMS Run AT service
<delay>	integer	0	value of the delay, in seconds Value: 0÷30 : supported range

AT#ATRUNDELAY?

Read command returns the current settings of parameters in the format:

#ATRUNDELAY: 0, <delayTCP>
#ATRUNDELAY: 1, <delaySMS>

OK

Not Subject to NDA

AT#ATRUNDELAY=?

Test command returns the supported values for the **ATRUNDELAY** parameters.

Not Subject to NDA

3.23.12. AT#TCPATRUNL - Enables TCP AT Run Service in Listen (Server) Mode

This 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.

Telit Running AT Commands Remotely Application Note, 80000NT10029a

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	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:

Name	Type	Default	Description
<mod>	integer	0	enable/disable TCP AT RUN service in server mode. Values: 0 : service disabled 1 : service enabled

to start automatically the service when the module is powered-on, the automatic PDP context activation has to be set (see **AT#SGACTCFG** command).

while the TCP Run AT service executes a command that takes long time to get the response, a new command will be pending until the module has finished sending all of its response result code.

Not Subject to NDA

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 all parameters.

Not Subject to NDA

3.24. Event Monitor

3.24.1. AT#ENAEVMONI - Enable EvMoni Service

This command enables/disables the EVENT MONITOR service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENAEVMONI=<mod>

Set command enables/disables the EVMoni service.

Parameter:

Name	Type	Default	Description
<mod>	integer	0	enable/disable service
	Values: 0 : disable service 1 : enable service		

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

AT#ENAEVMONI?

Read command returns the current settings of <**mode**> and the value of <**stat**> in the format:

#ENAEVMONI: <mod>,<stat>

Additional info:

Not Subject to NDA

Parameters:

Name	Type	Default	Description
<stat>	integer	0	service status
	Values:		
	0 : not active		
	1 : active		

AT#ENAEVMONI=?

Test command returns the supported values for the **<mod>** parameter.

Not Subject to NDA

3.24.2. AT#ENAEVMONICFG - Set EvMoni Service Parameters

This command configures the EvMoni service parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#ENAEVMONICFG=<instance>[,<URCMod>[,<timeout>]]

Parameters:

Name	Type	Default	Description
<instance>	integer	3	AT instance that will be used by the service to run the AT command Value: 1÷3 : AT instance
<URCMod>	integer	1	enable or disable unsolicited message. The URC format is: **#EVMONI: <Text>** Values: 0 : disable unsolicited message 1 : enable an unsolicited message when an AT command is executed after an event is occurred
<timeout>	integer	5	it defines the maximum time for a command execution. If timeout expires the module will be rebooted Value: 1÷60 : minutes

Unsolicited field:

Not Subject to NDA

Name	Type	Description
<Text>	string	is the AT Commands list sent on the instance that requested the service activation.

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 vice versa.

The set command returns **ERROR** if the command **#ENAEVMONI?** returns 1 as <**mod**> parameter or the command **#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 of parameters <**instance**>, <**urcmod**> and <**timeout**>.

Example of received URC

#EVMONI: AT+CGMR;+CGSN;+GSN;+CCLK

Not Subject to NDA

3.24.3. AT#EVMONI - Event Monitoring

This command provides a set of events that can be configured and monitored the device.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#EVMONI=<label>,<mode>[,<paramType>,<param>]

Set command enables/disables the single event monitoring, configures the related parameters and associates the AT command string to execute when the event has occurred.

Parameters:

Name	Type	Default	Description
<label>	string	N/A	event type; For each **<label>** (or event) is dedicated an Additional info section to describe the command syntax and its behavior.

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

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	"GPIO2"	:	monitoring on a selected GPIO in the GPIO range
	"GPIO3"	:	monitoring on a selected GPIO in the GPIO range
	"GPIO4"	:	monitoring on a selected GPIO in the GPIO range
	"GPIO5"	:	monitoring on a selected GPIO in the GPIO range
	"ADCH1"	:	ADC High Voltage monitoring
	"ADCL1"	:	ADC Low Voltage monitoring
	"DTMF1"	:	monitoring on user defined DTMF string
	"DTMF2"	:	monitoring on user defined DTMF string
	"DTMF3"	:	monitoring on user defined DTMF string
	"DTMF4"	:	monitoring on user defined DTMF string
	"SMSIN"	:	monitoring on incoming SMS

<mode>	integer	0	disable/enable single event monitoring Values: 0 : disable the single event monitoring 1 : enable the single event monitoring
<paramType>	integer	0	Indicates the type of parameter contained in <**param**>. In particular, <**paramType**>=0 indicates that <**param**> contains the AT command string to execute when the related event has occurred. Here

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are the rules to build the AT command string.

- The string must start with AT or at chars

- 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

Other <**paramType**> values define the <**param**> meaning according to the type of event. As stated above, for each event identified by the <**label**> is dedicated an Additional info section to describe the <**paramType**> values and the #EVMONI command behavior.

Values:

0 : indicates that <param> contains the AT command string to execute when the related event has occurred.

n : define the <param> meaning according to the event type. Refer to Additional info section.

<param>	string	-	Its meaning depends on the <**label**> and <**paramType**> parameters. Refer to Addition info section.

Additional info:

- <**label**>=VBATT, battery voltage monitoring.

  <**paramType**> can assume values in the range 0 - 2.

Name	Type	Default	Description

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<param>	integer	0	When <**paramType**>=1, <**param**> is the battery voltage threshold to monitor. Value: 0÷500 : 1 unit is 10 mV.
<param>	integer	0	When <**paramType**>=2, <**param**> is the time interval starting from the instant in which the voltage battery goes below the threshold specified with <**paramType**>=1. When the interval is elapsed and the voltage battery is below the threshold, the **#EVMONI** executes the AT command configured with <**paramType**>=0. Value: 0÷255 : seconds

▶▶ <**label**>=DTR, DTR monitoring.

<**paramType**> can assume values in the range 0 - 2.

Name	Type	Default	Description
<param>	integer	0	When <**paramType**>=1, <**param**> is the **DTR** status to monitor. Values: 0 : Low 1 : High
<param>	integer	0	When <**paramType**>=2, <**param**> is the time interval starting when DTR status has the value specified with <**paramType**>=1. When the interval

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			is elapsed and the DTR status is equal to the value previously specified, the **#EVMONI** executes the AT command configured with <**paramType**>=0.
			Value: 0÷255 : sec

- <**label**>=ROAM, roaming monitoring.

  <**paramType**> can assume only the value 0.

  After roaming, the **#EVMONI** executes the AT command configured with <**paramType**>=0.

- <**label**>=CONTDEACT, context deactivation

  <**paramType**> can assume only the value 0.

  After the deactivation of all active contexts, the **#EVMONI** executes the AT command configured with <**paramType**>=0.

- <**label**>=RING, call ringing monitoring.

  <**paramType**> can assume values in the range 0 - 1.

Name	Type	Default	Description
<param>	integer	1	When <**paramType**>=1, <**param**> is the number of call rings after which the event occurs. The event is notified by the execution of the AT command configured with <**paramType**>=0. Value:

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1÷50 : numbers of call rings

- <**label**>=STARTUP, module start-up monitoring.

  <**paramType**> can assume only the value 0.

  After module start-up, the **#EVMONI** executes the AT command configured with <**paramType**>=0.

- <**label**>=REGISTERED,

  <**paramType**> can assume only the value 0.

  When the module is started up, and the SMSs have been ordered in the internal memory, the event under monitoring is the network registration (to home network or in roaming). After registration, the **#EVMONI** executes the AT command configured with <**paramType**>=0

- <**label**>=GPIO1, GPIO2, GPIO3, GPIO4, GPIO5 monitoring.

  <**paramType**> can assume values in the range 0 - 3.

Name	Type	Default	Description
<param>	integer	1	When <**paramType**>=1, <**param**> is the GPIO pin number to be monitored. Supported range is from 1 to a value that depends on the hardware.
	Value:		
	1÷max :	max depends on the hardware.	
<param>	integer	0	When <**paramType**>=2, <**param**> is the GPIO status value to monitor.

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Values:

0 : GPIO status LOW

1 : GPIO status HIGH

<param>	integer	0	When <**paramType**>=3, <**param**> is the time interval starting when GPIO pin has the value specified with <**paramType**>=2. When the interval is elapsed and GPIO pin value is equal to the value previously specified, the **#EVMONI** executes the AT command configured with <**paramType**>=0. Value: 0÷255 : sec

▶▶ <**label**>=ADCH1, ADC High Voltage monitoring.

<**paramType**> can assume values in the range 0 - 3.

Name	Type	Default	Description
<param>	integer	1	When <**paramType**>=1, <**param**> is the ADC pin number to monitor. Value: 1÷max : max dependes on the hardware.
<param>	integer	0	When <**paramType**>=2, <**param**> is the ADC High voltage threshold to monitor. Value: 0÷2000 : Expressed in mV

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<param>	integer	0	When <**paramType**>=3, <**param**> is the time interval starting when the selected ADC pin (<**paramType**>=1) goes above the threshold specified with <**paramType**>=2. When the interval is elapsed and the ADC pin level is above the previously specified threshold, the **#EVMONI** executes the AT command configured with <**paramType**>=0. Value: 0÷255 : Expressed in sec

▶▶ <**label**>=ADCL1, ADC Low Voltage monitoring.

<**paramType**> can assume values in the range 0 - 3.

Name	Type	Default	Description
<param>	integer	0	When <**paramType**> = 1, <**param**> is the ADC pin number to monitor. Value: 1÷max : max dependes on the hardware.
<param>	integer	0	When <**paramType**> = 2, <param> is the ADC Low voltage threshold to monitor. Value: 0÷2000 : Expressed mV
<param>	integer	0	When <**paramType**>=3, <**param**> is the time interval starting when the selected ADC pin (<**paramType**>=1) goes below the threshold specified with <**paramType**>=2. When the

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interval is elapsed and the ADC pin level is below the previously specified threshold, the **#EVMONI** executes the AT command configured with <**paramType**>=0.

Does not matter the fluctuation of the ADC voltage inside the time interval.

Value:

0÷255 : Expressed in seconds.

▶▶ <**label**>=DTMF1, DTMF2, DTMF3, DTMF4 monitoring on user defined DTMF string.

<**paramType**> can assume values in the range 0 - 2.

Name	Type	Default	Description
<param>	string	-	When <**paramType**>=1, <**param**> is 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
<param>	integer	1000	When <**paramType**>=2, <**param**> is the maximum time interval within which a DTMF tone must be detected after the reception of the previous one in order to be considered as belonging to the DTMF string. When the complete DTMF string is received, the event has occured and the **#EVMONI** executes the AT command configured with <**paramType**>=0

Value:

Not Subject to NDA

500÷5000 : Expressed in msec

- <label>=SMSIN, monitoring on incoming SMS.

  <paramType> can assume values in the range 0 - 1.

Name	Type	Default	Description
<param>	string	-	When <paramType>=1, <param> contains the text string that must be received in an incoming SMS to create the event. In this case, #EVMONI executes the AT command configured with <paramType>=0. The maximum number of characters in the SMS text string is 15. If no text is specified in<param> (empty string), each incoming SMS triggers the event and #EVMONI executes the AT command configured with <paramType>=0.

- <label>=CONSUME1, CONSUME2, CONSUME3, CONSUME4, CONSUME5 used to define an action to be used in consume functionality, see #CONSUMECFG command.

  <paramType> can assume only values 0.

  When the action identified by the <action_id> parameter of the #CONSUMECFG command occurs, the #EVMONI executes the AT command configured with <paramType>=0.

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

Not Subject to NDA

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**> assume the meaning according to the <**paramType**> and <**label**> values used in the set command.

AT#EVMONI=?

Test command returns values supported as a compound value.

Not Subject to NDA

- Check the default configuration

```
AT#EVMONI?
#EVMONI: "VBATT",0,"",0,0
#EVMONI: "DTR",0,"",0,0
#EVMONI: "ROAM",0,""
#EVMONI: "CONTDEACT",0,""
#EVMONI: "RING",0,"",1
#EVMONI: "STARTUP",0,""
#EVMONI: "REGISTERED",0,""
#EVMONI: "GPIO1",0,"",1,0,0
#EVMONI: "GPIO2",0,"",1,0,0
#EVMONI: "GPIO3",0,"",1,0,0
#EVMONI: "GPIO4",0,"",1,0,0
#EVMONI: "GPIO5",0,"",1,0,0
#EVMONI: "ADCH1",0,"",1,0,0
#EVMONI: "ADCL1",0,"",1,0,0
#EVMONI: "DTMF1",0,"","",1000
#EVMONI: "DTMF2",0,"","",1000
#EVMONI: "DTMF3",0,"","",1000
#EVMONI: "DTMF4",0,"","",1000
#EVMONI: "SMSIN",0,"",""
OK
```

Configure VBATT event

```
AT#EVMONI="VBATT",0,0,"AT+CGMR"
OK
AT#EVMONI="VBATT",0,1,500
OK
AT#EVMONI="VBATT",0,2,255
OK
```

Check the VBATT event configuration

```
AT#EVMONI?
#EVMONI: "VBATT",0,"AT+CGMR",500,255
#EVMONI: "DTR",0,"",0,0
#EVMONI: "ROAM",0,""
#EVMONI: "CONTDEACT",0,""
#EVMONI: "RING",0,"",1
#EVMONI: "STARTUP",0,""
#EVMONI: "REGISTERED",0,""
#EVMONI: "GPIO1",0,"",1,0,0
#EVMONI: "GPIO2",0,"",1,0,0
#EVMONI: "GPIO3",0,"",1,0,0
```


Not Subject to NDA

```
#EVMONI: "GPIO4",0,"",1,0,0
#EVMONI: "GPIO5",0,"",1,0,0
#EVMONI: "ADCH1",0,"",1,0,0
#EVMONI: "ADCL1",0,"",1,0,0
#EVMONI: "DTMF1",0,"","",1000
#EVMONI: "DTMF2",0,"","",1000
#EVMONI: "DTMF3",0,"","",1000
#EVMONI: "DTMF4",0,"","",1000
#EVMONI: "SMSIN",0,"",""
OK
```

- Test command

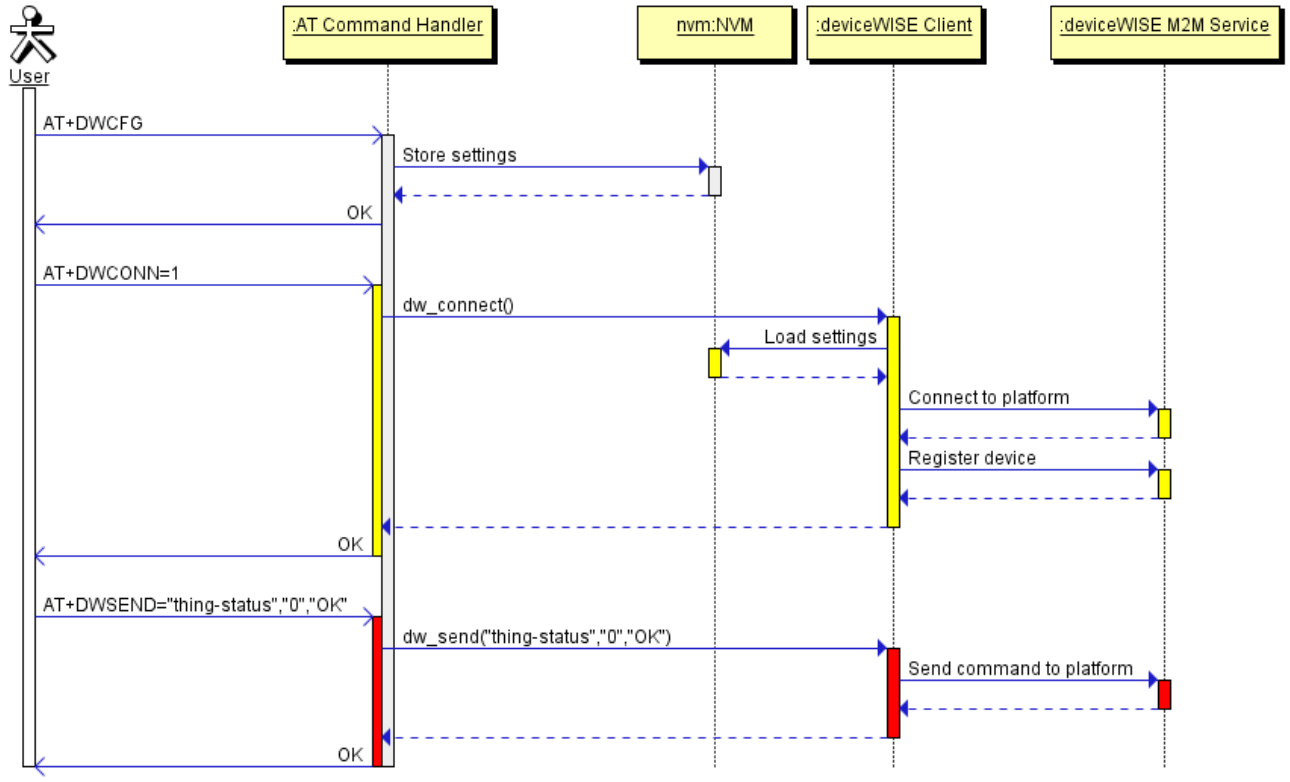
```
AT#EVMONI=?
#EVMONI: "VBATT",(0,1),(0-2),(0-500),(0-255)
#EVMONI: "DTR",(0,1),(0-2),(0,1),(0-255)
#EVMONI: "ROAM",(0,1),0
#EVMONI: "CONTDEACT",(0,1),0
#EVMONI: "RING",(0,1),(0,1),(1-50)
#EVMONI: "STARTUP",(0,1),0
#EVMONI: "REGISTERED",(0,1),0
#EVMONI: "GPIO1",(0,1),(0-3),(1-10),(0,1),(0-255)
#EVMONI: "GPIO2",(0,1),(0-3),(1-10),(0,1),(0-255)
#EVMONI: "GPIO3",(0,1),(0-3),(1-10),(0,1),(0-255)
#EVMONI: "GPIO4",(0,1),(0-3),(1-10),(0,1),(0-255)
#EVMONI: "GPIO5",(0,1),(0-3),(1-10),(0,1),(0-255)
#EVMONI: "ADCH1",(0,1),(0-3),(1),(0-2000),(0-255)
#EVMONI: "ADCL1",(0,1),(0-3),(1),(0-2000),(0-255)
#EVMONI: "DTMF1",(0,1),(0-2),(500-5000)
#EVMONI: "DTMF2",(0,1),(0-2),(500-5000)
#EVMONI: "DTMF3",(0,1),(0-2),(500-5000)
#EVMONI: "DTMF4",(0,1),(0-2),(500-5000)
#EVMONI: "SMSIN",(0,1),(0,1)
OK
```


Not Subject to NDA

3.25. IoT Portal

3.25.1. AT#DWCFG - Configure DeviceWISE Parameters

Configure deviceWISE parameters. Here is a basic interaction diagram.



SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#DWCFG=[<serverUrl>[,<deviceIDSelector>[,<appToken>[,<security>[,<heartBeat>[,<autoReconnect>[,<overflowHandling>[,<atrunInstanceId>[,<serviceTimeout>[,<contextID>[,<unused_1>[,<unused_2>[,<unused_3>]]]]]]]]]]]]]

This command permits to configure parameters related to the deviceWISE functionality

Parameters:

Name	Type	Default	Description

Not Subject to NDA

<serverUrl>	string	-	indicating the URL of the M2M Service instance in address:port form.
<deviceIDSelector>	integer	0	device identifier Values: 0 : IMEI (basically 0 if not SIM card or CDMA ID installed) 1 : CCID/ESN
<appToken>	string	-	Application token provided in the Management Portal, typically a string of 16 characters.
<security>	integer	0	SSL TLS secure connection enabling Values: 0 : SSL TLS disabled 1 : SSL TLS enabled
<heartBeat>	integer	60	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. Value: 10÷86400 : heartbeat time interval in seconds
<autoReconnect>	integer	2	Flag indicating if the connection manager should automatically reconnect to the service. Values: 0 : auto-reconnect disabled

Not Subject to NDA

			1 : auto-reconnect lazy - reconnect on next send and every 3600 seconds. 2 : auto-reconnect moderate - reconnect 120 seconds, then every 3600 seconds after the first day. 3 : auto-reconnect aggressive - reconnect every 120 seconds.
<overflowHandling>	integer	0	Flag indicating if the way to handle overflows in data management. Values: 0 : FIFO 1 : LIFO
<atrunInstanceId>	integer	2	AT instance used by the service to run the AT Command. Value: 0÷4 : AT instance that will be used by the service to run the AT Command(This param is not in use just for backward capability)
<serviceTimeout>	integer	5	It defines in seconds the maximum time interval for a service request to the server. Value: 1÷120 : time interval in seconds
<contextID>	integer	-	PDP context identifier (see +CGDCONT command)
<unused_1>	integer	-	parameter for future use. Must be set to 0

Not Subject to NDA

<unused_2>	integer	-	parameter for future use. Must be set to 0
<unused_3>	integer	-	parameter for future use. Must be set to 0

Additional info:

<security> - Flag indicating if the SSL encryption is enabled.

0 - SSL encryption disabled

1 - SSL encryption enabled

If SSL encryption enabling is required, some initial settings have to be done as follows. For further details, refer to "SSL/TLS User Guide".

SSL channel has to be enabled as follows:

AT#SSLEN=1,1

OK

If server authentication is needed, **#SSLSECCFG** has to be set as follows:

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).

<deviceIDSelector> is 0 basically if no SIM card or CDMA ID installed

Not Subject to NDA

AT#DWCFG?

Read command returns the current settings in the format:

#DWCFG:
<serverUrl>,<deviceIDSelector>,<appToken>,<security>,<heartBeat>,<autoReconnect>,<overflowHandling>,<atrunInstanceId>,<serviceTimeout>,<contextID>,0,0,0

AT#DWCFG=?

Test command returns the supported range of parameters **<deviceIDSelector>, <security>, <heartBeat>, <AutoReconnect>,<overflowHandling>,<atrunInstanceId>** and **<serviceTimeout>** and the maximum length of **<serverUrl> and <appToken>** parameters.

Not Subject to NDA

3.25.2. AT#DWSEND - Send Data to IoT Portal

The command is related to sending data to the IoT Portal

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#DWSEND=<type>,<param_1>[,<param_2>[,...[,<param_N>]]]

Execution command permits to send formatted data to the IoT Portal.

Parameters:

Name	Type	Default	Description
<type>	integer	0	code for the type of message to send. Values: 0 : normal request 1 : method request 2 : method update 3 : method ack
<param_1>	string	-	the meaning of the <**param_1**> parameter depends on the values of <**type**>. Refer to Additional info section.
<param_2>...<param_N>	string	-	the meaning of the <**param_2**> ... <**param_N**> parameters depends on the values of <**type**>. Refer to Additional info section.

Additional info:

Not Subject to NDA

▶▶ <type>=0, identifies an "API execution request" message format.

Name	Type	Default	Description
<param_1>	string	-	Contains the API command to execute.
<param_2+>	string	-	String parameter required by the method, in the format <key_i>,<value_i>. They are key-value pairs indicating the i-th parameter, with i=0,...,12. If the current API does not require input variables, these parameters can be omitted.

▶▶ <type>=1, identifies a "Remote method execution request" message format.

Name	Type	Default	Description
<param_1>	string	-	"thingKey", is the key of a thing to execute
<param_2>	string	-	timeout, time to wait before returning an error for the request.
<param_3>	string	-	method, the method key of a thing to execute
<param_4>	integer Values: 0 : more than one of these instances can exist	N/A	is singleton

Not Subject to NDA

		1 :	no more than one of these instances can exist
<param_5+>	string	-	string parameters required by the method, in the format <key_i>,<value_i>. They are key-value pairs indicating the i-th parameter, with i=0,...,10. If the current method does not require input variables, these parameters can be omitted.

▶▶ <type>=2, identifies a "Method update" message format.

Name	Type	Default	Description
<param_1>	string	-	id, the identification of the method instance
<param_2>	string	-	message, a message represents the current status of the method

▶▶ <type>=3, identifies a "Method acknowledgement" message format.

Name	Type	Default	Description
<param_1>	string	-	id, the identification of the method instance
<param_2>	string	-	status, the integer result status for the execution. 0 is reserved for **OK**
<param_3>	string	-	when status is set to non zero value: error message associated with the status

Not Subject to NDA

<param_3+>	string	-	when status is set to zero value: return parameters of the method. Key-value pairs should be used. <**param_i**> should be the name of the element and <**param_i+1**> should be the value of the element. If the current method does not require output variables, these parameters can be omitted.

- It's possible to use **#DWSEND** only if the connection has been opened with **#DWCONN**.
- If data are successfully sent, then the response is **OK**. If data sending fails for some reason, an error code is reported.
- The response to the **#DWSEND** command reports the <**msgId**> value that identifies the sending.
- 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** will be 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 commands **#DWRCV** and **#DWRCVR**).

AT#DWSEND=?

Test command reports the maximum length of **<type>** parameter.

Not Subject to NDA

3.25.3. AT#DWSENDR - Send Raw Data to IoT Portal

The command is related to sending data to the IoT Portal

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#DWSENDR=<dataLen>

Execution command permits to send raw data to the M2M Service.

Content must be valid JSON.

Parameter:

Name	Type	Default	Description
<dataLen>	integer	N/A	number of bytes to be sent
	Value:		
	1÷1500	:	range of the number of bytes to be sent

Additional info:

- **<dataLen>** - number of bytes to be sent

  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.

Not Subject to NDA

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**).

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.

Not Subject to NDA

3.25.4. AT#DWRCV - Receive Data from IoT Portal

The command is related to receiving data from the IoT Portal

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#DWRCV=<msgId>

Execution command permits the user to read formatted data arriving from IoT Portal.
The incoming data have been previously notified by the following URC:

#DWRING: <type>,<msgId>,<len>

Parameter:

Name	Type	Default	Description
<msgId>	integer	-	index of the data message to receive, as indicated in the URC **#DWRING**

Additional info:

- 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>]]]

Name	Type	Default	Description
<msgId>	string	-	defined as Set section
<error>	string	-	error code of the message to receive, 0 if there is no error.
<len>	string	-	defined as Set section

Not Subject to NDA

<param_i>	string	-	indicating the i-th parameter associated to the type specified

▶▶ 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>

Name	Type	Default	Description
<type>	string	-	type of message to receive
<msgId>	integer	-	index of the data message to receive
<len>	integer	-	length of data message to receive

it is possible to use **AT#DWRCV** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error.

If the data received are the consequence of a previous data sending issued by **AT#DWSEND**, then they can be read only using **AT#DWRCV** command and not **AT#DWRCVR** command (i.e.: **AT#DWRCV** and **AT#DWRCVR** are not interchangeable).

AT#DWRCV=?

Test command reports the supported range of values for all parameters.

Not Subject to NDA

3.25.5. AT#DWLRCV - List Information on Messages Pending from IoT Portal

This command allows the users to get the list of the incoming messages from IoT Portal.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#DWLRCV

Execution command reports the list of the pending messages from IoT Portal in the following format:

#DWLRCV:<msg_number>[,<msgId_1>,<msg_1_len>[, ...<msgId_N>,<msg_N_len>]]

Additional info:

- Parameters meanings.

Name	Type	Default	Description
<msg_number>	integer	-	number of messages pending from IoT Portal (at least 0)
<msgId_i>	integer	-	index of the i-th data message to receive
<msg_i_len>	integer	-	length of the i-th data message to receive

It is possible to use **#DWLRCV** only if the connection has been opened with **#DWCONN**, else the ME is raising an error.

Not Subject to NDA

AT#DWLRCV=?

Test command reports **OK** result code.

Not Subject to NDA

3.25.6. AT#DWSTATUS - Query Connection Status

The command purpose is to query the IoT Portal to receive the status of the connection, including some runtime statistics.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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.

Additional info:

▶▶ The IoT Portal will return a generic structure:

#DWSTATUS: <connected><lastErrorCode>,<latency>,<pktsIn>,<pktsOut>,<bytesIn>,<bytesOut>

Name	Type	Default	Description
<connected>	integer	N/A	Connection status. Values: 3 : waiting to connect 2 : connected 1 : trying to connect 0 : disconnected
<lastErrorCode>	integer	-	last error code encountered by the client.
<latency>	integer	-	milliseconds measured between last request and reply.

Not Subject to NDA

<pktsIn>	integer	-	number of packets received, tracked by the server
<pktsOut>	integer	-	number of packets sent
<bytesIn>	integer	-	number of bytes received, TCP/IP payload
<bytesOut>	integer	-	number of bytes sent

AT#DWSTATUS=?

Test command reports **OK** result code.

Not Subject to NDA

3.25.7. AT#DWCONN - Connect to IoT Portal

This command connects/disconnects to the IoT Portal.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#DWCONN=<connect>

Set command connects/disconnects to the M2M Service.

Parameter:

Name	Type	Default	Description
<connect>	integer	0	flag to connect/disconnect to the M2M Service
			Values: 0 : disconnect 1 : connect

AT#DWCONN=1 performs the socket connection and the MQTT connection. **AT#DWCONN=0** performs the socket disconnection.

the PDP Context used for the network connection is the first (**<cid>**=1 has to be previously defined with **AT+CGDCONT** command and activated with **AT#SGACT** command)

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?

Not Subject to NDA

Read command returns the current settings for all parameters in the format:

#DWCONN: <connect>,<status>

Additional info:

- Read command response format:

Name	Type	Default	Description
<connect>	integer	-	see Set section
<status>	integer	N/A	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.

Not Subject to NDA

3.25.8. AT#DWRCVR - Receive Raw Data from M2M Service

This command permits the user to read raw data arriving from M2M Service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	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**.

Parameter:

Name	Type	Default	Description
<msgId>	integer	-	index of the data message to receive, as indicated in the URC **#DWRING**

Additional info:

- 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>

Name	Type	Default	Description
<type>	integer	-	type of the data message to receive
<msgId>	integer	-	index of the data message to receive

Not Subject to NDA

<len>	integer	-	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>

Name	Type	Default	Description
<msgId>	integer	-	defined as Set section
<error>	integer	-	error code of the message to receive, 0 if there is no error.
<len>	integer	-	defined as Set section
<data>	string	-	M2M Service data

it is possible to use **AT#DWRCVR** only if the connection has been opened with **AT#DWCONN**, else the ME is raising an error.

If the data received are the consequence of a previous data sending issued by **AT#DWSENDR**, then they can be read only using **AT#DWRCVR** command and not **AT#DWRCV** command (i.e.: **AT#DWRCV** and **AT#DWRCVR** are not interchangeable).

AT#DWRCVR=?

Test command reports the supported range of values for all parameters.

Not Subject to NDA

3.25.9. AT#DWEN - Enable Agent Features

This command permits to enable/disable up to 8 different deviceWISE features.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#DWEN=<feat>,<en>[,<option1>[,<option2>[,<option3>[,<option4>[,<option5>]]]]]

Set command permits to enable/disable up to 8 different deviceWISE features.

Parameters:

Name	Type	Default	Description
<feat>	integer	N/A	feature to enable or disable Values: 0 : remote at commands 1÷7 : reserved for future use
<en>	integer	N/A	enable or disable this features Values: 0 : disable the feature 1 : enable the feature
<option1>	string	-	reserved for future use
<option2>	string	-	reserved for future use
<option3>	string	-	reserved for future use
<option4>	string	-	reserved for future use
<option5>	string	-	reserved for future use

Not Subject to NDA

the **<en>** value is considered only at the very first connection to M2M Service (**AT#DWCONN=1**) after a device power on or reboot

feature 0 (Remote AT commands) has no option

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.

Not Subject to NDA

3.25.10. AT#LWM2MSKIP - No Starting any LwM2M Client

The set command enables/disables the LwM2M Client startup in the module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#LWM2MSKIP=<enable>[,<agentMask>][,<reboot>]

The set command enables/disables the LwM2M Client initialization and startup in the module.

It was created to give the user the possibility to control the LwM2M client initialization.

Parameters:

Name	Type	Default	Description
<enable>	integer	0	enables or disables the "skipping client startup" modality Values: 0 : skip is disabled, thus all the LwM2M clients shall start 1 : skip is enabled, thus all the LwM2M clients shall not start
<agentMask>	hex	N/A	enables or disables the "skipping client startup" modality for a LwM2M clients set. It is expressed in hexadecimal format. The command admits the parameter in hexadecimal format without the prefix 0x. The following values are accepted but they will result in an **ERROR** as far as

Not Subject to NDA

			there is not a LwM2M client mapped on: 1: Telit client, bit mask 00000001 2: Verizon client, bit mask 00000010 4: AT&T client, bit mask 00000100 8: DOCOMO client, bit mask 00001000 **<agentMask>**= 0 is not allowed since it is useless: it means that the skipping/not skipping required operation should not affect any clients. Giving the command without **<agentMask>** parameter will affect all LwM2M clients. Value: 1÷FF : bit mask length
<reboot>	integer	1	enables or disables the reboot possibility after the command setting. Values: 0 : Reboot is disabled 1 : Reboot as part of issuing the command (Default)

If the command is used to change the current agents skip settings, in case of <**reboot**> parameter missing or set to 1, the module is rebooted.

No reboot will be triggered if the command is not changing the current behavior.

Not Subject to NDA

The command affects only the clients indicated in the **<agentMask>**. If a client startup is already skipped, a successive skip setting involving another agent will not impact on the former one (see example).

There is no relation between the LwM2M in the **<agentMask>** and the module customization: it is possible to set the skip property for a Verizon client even on a module not customized for it; it simply returns '**OK**' but there will not be a real effect at the successive startup.

AT#LWM2MSKIP?

Read command reports the current values of parameters in the format:

#LWM2MSKIP: <enable>,<maskStatus>

AT#LWM2MSKIP=?

Test command reports the supported range of values for all the parameters.

Not Subject to NDA

- LE910Cx Linux :

  // verify the supported range of values

  AT#LWM2MSKIP=?

  #LWM2MSKIP: (0,1),(1-FF),(0,1)

  OK

  // verify the currently set value

  AT#LWM2MSKIP?

  #LWM2MSKIP: 0,0

  OK

  // set to disable LwM2M client, it will reboot in particular cases (see additional notes)

  AT#LWM2MSKIP=1

  OK

  // set to disable LwM2M client, but force NO reboot

  AT#LWM2MSKIP=1,,0

  OK

- LE910Cx ThreadX :

  // set the skip property for all agents available in the module's file system.

  AT#LWM2MSKIP=1

  OK

  // return the answer after the first example command: all LwM2M clients should be skipped. The mask could vary according to the agents available in the module's file system.

  AT#LWM2MSKIP?

  #LWM2MSKIP: 1,7

  OK

Not Subject to NDA

// reset the skipping property for Telit Client. Please notice as the other LwM2M clients are not affected, since not indicated in the <agentMask>

AT#LWM2MSKIP=0,1

OK

AT#LWM2MSKIP?

#LWM2MSKIP: 1,6

OK

// verify the supported range of values

AT#LWM2MSKIP=?

#LWM2MSKIP: (0,1),(1-FF),(0,1)

OK

Not Subject to NDA

3.25.11. AT+ODIS - Commands for Saving and Retrieving the Odis Parameters

This command allows the end-user to handle the Host ODIS parameters. In case of AT&T LwM2M agent up and running, the command is executed internally to the LwM2M client, updating this client about the values change (i.e.: the server will be notified about this change if the observation on these items is active).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+ODIS=<instance>,<hostUniqueDevId>,<hostManufacturer>,<hostModel>,<hostSwVersion>

Parameters:

Name	Type	Default	Description
<instance>	integer	N/A	Instance number Values: 0 : Instance #0 1 : Instance #1
<hostUniqueDevId>	string	-	contains a string, between double quotes, with the host unique device identifier HUID0, default value
<hostManufacturer>	string	-	contains a string, between double quotes, with the host manufacturer identifier. HMAN0, default value
<hostModel>	string	-	contains a string, between double quotes, with the host model identifier. HMOD0, default value

Not Subject to NDA

<hostSwVersion>	string	-	contains a string, between double quotes, with the host software version identifier. HSW0, default value

The odis setting requires all the odis values to be set each time the command is issued, therefore, to change only one odis parameters it is recommended to read all the values first, and then compose the command input string accordingly.

Since the odis items are 4, it is quite unlikely but possible that some the storing of some of them fails. In this case, the new values, where succeeded, are kept. An advice is that, in case of storing failure, the +ODIS? command is used to verify what are the odis items changed, if any.

This command is only valid on AT&T firmware, and not on other carriers firmware.

AT+ODIS?

Read command reports the current odis values in the format:

+ODIS: <instance#0>,<hostManufacturer#0>,<hostModel#0>,<hostSwVersion#0>

+ODIS: <instance#1>,<hostManufacturer#1>,<hostModel#1>,<hostSwVersion#1>

As per AT&T specification, the **<hostUniqueDevId>** odis parameter could be set but it cannot be read by AT commands.

AT+ODIS=?

Test command reports the supported range of values for all parameters

Not Subject to NDA

AT+ODIS?

+ODIS: 0,"HMAN0","HMOD0","HSW0"

+ODIS: 1,"HMAN1","HMOD1","HSW1"

OK

AT+ODIS=0,"HUID12","HMAN34","HMOD56","HSW78"

OK

AT+ODIS?

+ODIS: 0,"HMAN34","HMOD56","HSW78"

+ODIS: 1,"HMAN1","HMOD1","HSW1"

OK

Not Subject to NDA

3.25.12. AT#FOTAURC - Sets FOTA Extended URCs

This command allows the end-user to enable/disable the FOTA extended URCs, resulting in a verbosity FOTA operations.

Those settings are generally neither related nor manageable with other LwM2M agent commands.

This command is available only **LE910Cx ThreadX** product.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#FOTAURC=<enable>

The settings are stored in the module and are not affected by module power-cycle, TFI or FOTA flashing.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enable/disable extended URCs Values: 0 : disable extended URCs 1 : enable extended URCs

This command affects LwM2M, FA1 and OTAUP operations.

The command should add the following URCs:

49. **#OTAEV: "FOTA REQUEST INIT"** at the FOTA startup beginning
50. **#OTAEV: "DOWNLOAD STARTED"** at the delta package download beginning
51. **#OTAEV: "DOWNLOAD COMPLETED"** at the delta package download end

Not Subject to NDA

52. **#OTAEV: "DOWNLOAD FAILED"** at the delta package download failure
53. **#OTAEV: "INTEGRITY CHECK PASS"** in case of valid delta package
54. **#OTAEV: "INTEGRITY CHECK FAIL"** in case of invalid delta package

Please notice that following error URCs are issued always, regardless the **#FOTAURC**

command setting:

#OTAEV: "DOWNLOAD FAILED"

#OTAEV: "INTEGRITY CHECK FAIL",<errorCode>

Please notice that the time to issue the URCs is strictly related to the agent that is in charge of managing the FOTA operations and may strongly vary between them.

Please notice that the **#OTAEV: "INTEGRITY CHECK FAIL"** URC may appear more than once, according to the retry policy of the delta validity check used by the FOTA entity, such as in LwM2M client.

<errorCode> reported in **#OTAEV: "INTEGRITY CHECK FAIL"** URC may assume the following values:

55. 10 in case of invalid delta file (i.e.: when the delta file has an invalid or corrupted tag)
56. 21 in case of CRC calculated error (i.e.: when the delta file is not applicable to the current software version)

AT#FOTAURC?

Returns the **<enable>** value

#FOTAURC: <enable>

AT#FOTAURC=?

Not Subject to NDA

Test command reports the supported range of values.

```
AT#FOTAURC =?
#FOTAURC: (0,1)

OK
```


Not Subject to NDA

#FOTAURC command examples:

- LwM2M:

  After writing resource /5/0/1 with a proper URI with a valid delta package link:

  #OTAEV: "FOTA REQUEST INIT"

  #OTAEV: "DOWNLOAD STARTED"

  #OTAEV: "DOWNLOAD COMPLETED"

  #OTAEV: "INTEGRITY CHECK PASS"

  #LWM2MINFO: "GEN","FOTA REBOOT"

  #OTAEV: Module Upgraded To New Fw

  After writing resource /5/0/1 with a proper URI with an invalid delta package link:

  #OTAEV: "FOTA REQUEST INIT"

  #OTAEV: "DOWNLOAD STARTED"

  #OTAEV: "DOWNLOAD COMPLETED"

  #OTAEV: "INTEGRITY CHECK FAIL"

  After writing resource /5/0/1 with a proper URI, with a download failure:

  #OTAEV: "FOTA REQUEST INIT"

  #OTAEV: "DOWNLOAD STARTED"

  #OTAEV: "DOWNLOAD FAILED"

- FA1:

  After sending an FA1 message with a valid delta package link:

  #OTAEV: "FOTA REQUEST INIT"

  #OTAEV: "DOWNLOAD STARTED"

  #OTAEV: "DOWNLOAD COMPLETED"

  #OTAEV: "INTEGRITY CHECK PASS"

  #OTAEV: "FOTA REBOOT"

  #OTAEV: Module Upgraded To New Fw

Not Subject to NDA

- OTAUP:

  Using a formerly loaded valid package:

  AT#OTAUP=0,3

  ...

  OTAEV: "INTEGRITY CHECK PASS"

  ...

  #OTAEV: Module Upgraded To New Fw

  Using a formerly loaded invalid package:

  AT#OTAUP=0,3

  ...

  OTAEV: "INTEGRITY CHECK FAIL"

Not Subject to NDA

3.26. FOTA & OMA

3.26.1. FOTA Legacy

3.26.1.1. AT#OTAUPW - OTA Delta Write

Execution command starts injection of a delta file into the device.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#OTAUPW=[<param1>]

This command will only write the file to the device to be ready for installation.

In order to install the delta file, you have to send the command **#OTAUP**.

You can send **#OTAUPW** with or without **<param1>** parameter.

Once received the command **#OTAUPW**, the device prints the "**CONNECT**" reply wait for data to received.

Parameter:

Name	Type	Default	Description
<param1>	integer	0	**LE910Cx Linux:** size in bytes of data to be injected **LE910Cx ThreadX:** verbose level Values: 0 : hash mark printing disabled during injection, (LE910Cx ThreadX only)

Not Subject to NDA

	1	: hash mark printing enabled during injection every 4096 bytes (LE910Cx ThreadX only)

Send escape sequence +++ to end data transmission (which will result in OK response).

In **LE910Cx Linux**, If <**param1**> parameter value was specified, the command will report OK once all size is received.

In **LE910Cx ThreadX**, escape sequence detection (+++) works after 2 seconds from last data received. In escape sequence detection mode, any other characters except escape sequence +++ will return **ERROR.**

The following AT configurations restore to default value after FOTA Update. It applies to both **LE910CxLinux** and **LE910Cx ThreadX**

Common profile section (See 3.3.1 Factory Profile and User Profiles for details)

+WS46, +CEMODE, +CGSMS, #AUTOATT, #WKIO, #ENS, #SCFGEXT3, #DNS, #HTTPCFG, $SLP, $LCSSLP, $SLPTYPE, $SUPLSEC, $SUPLV, $LTC, $GPSLOCK, $AGPSEN, $LCSLPP, #SMSMODE, #PLMNMODE, #BND, #SCFG, #AUTOBND, #JDRENH2, #JDR4GCFG, #IMSPDPSET, $LCSAGLO, $GPSDPO, #SSLCFG, #SSLSECCFG, #PROTOCOLCFG, $GPSELNA, #TXCAL, #CALLDISA, #BCCHLOCK, #HOSTODIS, #TXCAL4G, #CLATENA, #GTPEN, #ECALLNWTMR, #ECALLTMR, $XTRAEN, #SINGLEAPNSWITCH, #ALLOWHAC, #ECALLURC, +CSCB, #PKTSZ, #DSTO, #SKTTO, #SKTCT, +ODIS, #GPIO, #TEMPCFG, #SIMINCFG

AT#OTAUPW=?

Test command returns **OK** result code.

Not Subject to NDA

- LE910Cx Linux:

  // Send the command #OTAUPW to start the

  // injection of the Delta FW into module's flash memory

  AT#OTAUPW

  CONNECT

  // Send the Delta FW to the module via user's USB/SERIAL interface

  // remind to use hardware flow control while sending the file

  // Once the sending of the file has been terminated,

  // close the connection through the escape sequence (+++).

  +++

  OK

- LE910Cx ThreadX:

  // Send the command #OTAUPW to start the

  // injection of the Delta FW into module's flash memory

  AT#OTAUPW

  CONNECT

  // Send the Delta FW to the module via user's USB/SERIAL interface

  // remind to use hardware flow control while sending the file

  // Once the sending of the file has been terminated, wait at least 2 seconds

  // to close the connection through the escape sequence (+++).

  +++

  OK

  AT#OTAUPW

  CONNECT

  // Send the Delta FW to the module via user's USB/SERIAL interface

  // remind to use hardware flow control while sending the file

  // Once the sending of the file has been terminated, wait at least 2 seconds

  // to enter the escape sequence detection mode.

Not Subject to NDA

// Send wrong escape sequence character 'a'

a

ERROR

Not Subject to NDA

3.26.2. OMA-DM

3.26.2.1. AT#HOSTODIS - Host ODIS Parameters Management

The command manages the Host Odis parameters related to AT&T OMA LwM2M Client.

[1] <CDR-DVM-4543> of AT&T, revision 19.2

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#HOSTODIS=<Param>,<Action>[,<Value>[,<Instance>]]

The set command allows the end-user to handle the Host Odis parameters for AT&T OMA LwM2M client

Parameters:

Name	Type	Default	Description
<Param>	integer	N/A	selects the specific item on which work. Values: 0 : Host Manufacturer name 1 : Host model Name 2 : Host Software application version 3 : Host Device Unique ID
<Action>	integer	N/A	selects the action to be performed on the item selected by <**Param**> Values: 0 : "SET" action

Not Subject to NDA

	1 : "GET" action 2 : "RESET" action		
<Value>	string	-	contains a string, between double quotes, with data to be set. Maximum string length is 64 characters. It is valid only if **<Action>** = 0 ("SET" action)
<Instance>	integer Value: 0,1 : allowed values	0	instance number

Host Manufacturer, Host Model and Host Software application version do not change after an OTA firmware upgrade

"GET" action is not allowed on Host Device Unique ID.

Default values, according to specification [1], are:

Instance 0:

57. HUID0 (for Host Device Unique ID)
58. HMAN0 (for Host Manufacturer)
59. HMOD0 (for Host Model)
60. HSW0 (for Host Software version)

Instance 1:

61. HUID1 (for Host Device Unique ID)
62. HMAN1 (for Host Manufacturer)
63. HMOD1 (for Host Model)
64. HSW1 (for Host Software version)

AT#HOSTODIS=?

Test command returns the supported values ranges of the parameters.

Not Subject to NDA

Get the currently set values (i.e.: Host Model)
AT#HOSTODIS=1,1
#HOSTODIS:"HMOD1"
OK

Set a new Host Model value
AT#HOSTODIS=1,0,"Model #4 - 2nd version"
OK

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

Reset the Model value
AT#HOSTODIS=1,2
OK

Get again the currently set value
AT#HOSTODIS=1,1
#HOSTODIS:"HMOD1"
OK

Not Subject to NDA

3.26.2.2. AT#VZWFOTAURC - Enable / Disable VZW FOTA URC

Enable / Disable Verizon FOTA URC

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#VZWFOTAURC=<enable>

This command is used to enable / disable URC during Verizon FOTA session

Parameter:

Name	Type	Default	Description
<enable>	integer	1	URC enable
	Values: 0 : Disable 1 : Enable		

AT#VZWFOTAURC?

Read command reports the current setting for Verizon URC enable, in the format:

#VZWFOTAURC: <enable>

AT#VZWFOTAURC=?

Test command reports the supported range of values for the **<enable>** parameter

This command is for Verizon OTADM

Not Subject to NDA

- AT#VZWFOTAURC?
  #VZWFOTAURC: 1

  OK

  AT#VZWFOTAURC=0
  OK

  AT#VZWFOTAURC=?
  #VZWFOTAURC: (0,1)

  OK

Not Subject to NDA

3.26.2.3. AT#VZWDM - Trigger user initiated DM / FUMO session

Trigger user initiated DM / FUMO session

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#VZWDM=<session_type>

This command is used to trigger user initiated DM / FUMO session for Verizon OTADM

Parameter:

Name	Type	Default	Description
<session_type>	integer	N/A	session type Values: 0 : DM session 1 : FUMO session

If firmware update is available for FUMO session, firmware download and update will be started according to #VZWFOTACFG setting

AT#VZWDM=?

Test command reports the supported range of values for the <session_type> parameter.

Not Subject to NDA

- AT#VZWDM=?

  #VZWDM: (0, 1)

  OK

  AT#VZWDM=0

  OK

  AT#VZWDM=1

  OK

  // In case of update package is not available

  #OTAEV: No Update Available

  // In case of update package is available, FUMO session will be continued with the following URC

  #OTAEV: FOTA REQUEST INIT

Not Subject to NDA

3.26.2.4. AT#VZWSENDUA - Send user action during VZW FOTA

Send user action for Verizon FOTA

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#VZWSENDUA=<action>

This command is used to send user action for download or update during Verizon FOTA

Parameter:

Name	Type	Default	Description
<action>	integer	N/A	user action Values: 0 : Cancel 1 : Accept 2 : Defer (for 24 hours)

Additional info:

- This command works only after following URCs are received:
  #OTAEV: DOWNLOAD READY
  or
  #OTAEV: UPDATE READY

AT#VZWSENDUA=?

Test command reports the supported values for the **<action>** parameter

Not Subject to NDA

Not Subject to NDA

AT#VZWSENDUA=?

#VZWSENDUA: (0-2)

OK

AT#VZWFOTACFG=3

OK

AT#VZWFOTACFG?

#VZWFOTACFG: 3

OK

// Server send push message for FOTA

#OTAEV: FOTA REQUEST INIT

#OTAEV: DOWNLOAD READY

AT#VZWSENDUA=1

OK

#OTAEV: DOWNLOAD STARTED

#OTAEV: DOWNLOAD PROGRESS [1/100]

...

#OTAEV: DOWNLOAD PROGRESS [100/100]

#OTAEV: DOWNLOAD COMPLETED

#OTAEV: UPDATE READY

AT#VZWSENDUA=1

OK

#OTAEV: UPDATE STARTED

// Device will reboot to install update package. Update will take some time depends on size of delta package.

Not Subject to NDA

#OTAEV: Module Upgraded To New FW

Not Subject to NDA

3.26.2.5. AT#VZWDMACCURL - Configure VZW DM Server URL

Configure VZW DM Server URL

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#VZWDMACCURL=<url>[,<port>]

This command is used to change the VZW DM Account Server for Verizon OTADM.

Parameters:

Name	Type	Default	Description
<url>	string	-	String parameter that indicate DM account server URL. Default value is "https://4g2.vzwdm.com"
<port>	integer	443	the server port to be used. Value: 1÷65535 : Port range

AT#VZWDMACCURL?

Read command reports the current setting for Verizon DM server, in the format:

#VZWDMACCURL: <url>:<port>

AT#VZWDMACCURL=?

Test command reports the supported range of values for the **<url>** and **<port>** parameter.

Not Subject to NDA

AT#VZWDMACCURL?

#VZWDMACCURL: https://ii4g.motive.com:443

OK

AT#VZWDMACCURL=https://ii4g.motive.com,443

OK

AT#VZWDMACCURL?

#VZWDMACCURL: https://ii4g.motive.com,443

OK

AT#VZWDMACCURL=https://ivzwmdmv.iot.motive.com

OK

AT#VZWDMACCURL?

#VZWDMACCURL: https://ivzwmdmv.iot.motive.com:443

OK

AT#VZWDMACCURL=?

#VZWDMACCURL: ,(1-65535)

OK

Not Subject to NDA

3.26.2.6. AT#VZWFOTACFG - Configure Verizon FOTA Download and Update Option

Configure Verizon FOTA download and update option

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#VZWFOTACFG=<mode>

This command is used to configure Verizon FOTA download and update option.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Verizon FOTA mode for download and update

Values:

0 : Auto Download / Auto Update

1 : Auto Download / Manual Update

2 : Manual Download / Auto Update

3 : Manual Download / Manual Update

4 : Reject FOTA Request

For manual download or update, #VZWSENDUA command should be issued to proceed to FUMO operation.

AT#VZWFOTACFG?

Read command reports the current setting for Verizon FOTA configuration, in the format:

Not Subject to NDA

#VZWFOTACFG: <mode>

AT#VZWFOTACFG=?

Test command reports the supported range of values for the **<mode>** parameter.

This command is for Verizon OTADM.

Not Subject to NDA

- AT#VZWFOTACFG?
  #VZWFOTACFG: 0
  OK

  // Server send push message for FOTA
  #OTAEV: FOTA REQUEST INIT
  #OTAEV: DOWNLOAD STARTED
  #OTAEV: DOWNLOAD PROGRESS [1/100]
  ...
  #OTAEV: DOWNLOAD PROGRESS [100/100]
  #OTAEV: DOWNLOAD COMPLETED
  #OTAEV: UPDATE STARTED

  // Device will reboot to install update package. Update will take some times depends on size of delta package.
  #OTAEV: Module Upgraded To New FW

- AT#VZWFOTACFG=3
  OK
  AT#VZWFOTACFG?
  #VZWFOTACFG: 3
  OK

  // Server send push message for FOTA
  #OTAEV: FOTA REQUEST INIT
  #OTAEV: DOWNLOAD READY

  // Send Accept using #VZWSENDUA command
  AT#VZWSENDUA=1

Not Subject to NDA

OK

#OTAEV: DOWNLOAD STARTED

#OTAEV: DOWNLOAD PROGRESS [1/100]

...

#OTAEV: DOWNLOAD PROGRESS [100/100]

#OTAEV: DOWNLOAD COMPLETED

#OTAEV: UPDATE READY

// Send Accept using #VZWSENDUA command

AT#VZWSENDUA=1

OK

#OTAEV: UPDATE STARTED

// Device will reboot to install update package. Update will take some times depends on size of delta package.

#OTAEV: Module Upgraded To New FW

- AT#VZWFOTACFG=4

  OK

  AT#VZWFOTACFG?

  #VZWFOTACFG: 4

  OK

  // Server send push message for FOTA but FOTA request will be ignored silently.

Not Subject to NDA

3.27. M2M

3.27.1. AT#M2MARG - M2M Set Arguments

Set command sets/resets the main arguments of the executable binary file (".bin" extension) saved in "/mod" directory which RUN permission has been set by **#M2MRUN** command. The arguments are used by M2MB_main(argc, argv) function.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT#M2MARG=[<file_bin>],[<arg1>,<arg2>,...,<argn>,...,<argN>]

Parameters:

Name	Type	Default	Description
<file_bin>	string	-	executable file name selected for arguments setting/resetting. If parameter **<file_bin>** is not present, the arguments configuration is applied to all executables. The format of **<file_bin>** is a quoted or unquoted string, max 64 chars, case sensitive.
<arg1>...<argN>	mixed	-	arguments to be applied. Format is unquoted string (max 32 chars, case sensitive) and maximum number of arguments is N=10. The empty space is seen as normal character. Comma is not supported as char inside arguments. If none of **<argn>** is present, arguments are deleted (reset). If an empty arg is provided in between other args, an ERROR is returned being

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the current args remained unchanged. See the following examples:

AT#M2MARG=app.bin,arg1,arg2,...,argN
set the arguments to "/mod/app.bin" if it exists

AT#M2MARG=,arg,arg2,...,argN
set the arguments to all executables

AT#M2MARG=app.bin,
delete the arguments of "/mod/app.bin" if it exists

AT#M2MARG=,
delete the arguments of all executable

AT#M2MARG=app.bin,arg1,,arg3
if an empty arg is provided in between other args, an ERROR is returned being the current args remained unchanged

The arguments entered by the command are saved on "/mod/appcfg.ini" file.

AT#M2MARG?

Read command reports the available executables and their current arguments. The report has the following format:

#M2MARG: <app1.bin,arg1,arg2,...,argN1>
#M2MARG: <app2.bin,arg1,arg2,...,argN2>
...
#M2MARG: <appQ.bin,arg1,arg2,...,argNQ>

Not Subject to NDA

AT#M2MARG=?

Test command returns the max characters number of **<file_bin>** binary file name and of the **<arg$_n$>** parameters. The format is:

#M2MARG: 64,32,...,32

AT#M2MARG=app1.bin,one,two,12,34.5
OK

AT#M2MARG=app2.bin,first,"second and third"
OK

AT#M2MARG=?
#M2MARG: <app1.bin, one,two,12,34.5>
#M2MARG: <app2.bin, first,"second and third">
OK

Not Subject to NDA

3.27.2. AT#M2MCHDIR - M2M File System Change Current Directory

This command manages the M2M File System.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MCHDIR=<path>

Set command sets the current working directory in the M2M file system.

Parameter:

Name	Type	Default	Description
<path>	string	-	can be: - full directory path name starting with "/" - relative directory path name - directory name (in current directory)

- Maximum full directory length is 128 chars, maximum folder name is 64 chars.
- If **<path>** is not present an error code is reported.
- **<path>** is case sensitive.
- **<path>** can be equivalently enclosed on quote or not.
- Path separator must be "/".
- The current directory in M2M file system at every power on is "/data/azc/mod".

AT#M2MCHDIR?

Not Subject to NDA

Read command reports the current working directory in the current drive in the M2M file system in the format:

#M2MCHDIR: <path_name>

Additional info:

- Parameter description is:

Name	Type	Default	Description
<path>	string	-	Absolute path name, quoted string type (max 128 chars, case sensitive)

AT#M2MCHDIR=?

Test command returns **OK** result code.

Check directory and move to dir1 directory.

- **AT#M2MCHDIR?**
  #M2MCHDIR: "/data/azc/mod"
  OK
  AT#M2MCHDIR="dir1"
  OK
  AT#M2MCHDIR?
  #M2MCHDIR: "/data/azc/mod/dir1"
  OK

Not Subject to NDA

3.27.3. AT#M2MMKDIR - M2M File System Make Directory

This command manages the M2M File System.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MMKDIR=<directory_name>

Set command makes a new directory in current directory (see **#M2MCHDIR**) or on a specified path. The new directory must be created on existing path, only one directory at time can be created.

Parameter:

Name	Type	Default	Description
<directory_name>	string	-	can be: - full directory path name starting with "/" (parent directory must exist) - relative directory path name (parent directory must exist) - directory name (in current directory)

Maximum full directory length is 128 chars, maximum folder name is 64 chars

<directory_name> is case sensitive

<directory_name> can be equivalently enclosed on quote or not.

Not Subject to NDA

AT#M2MMKDIR=?

Test command returns **OK** result code

AT#M2MMKDIR="dir1"

OK

/myfolder is "/data" or its-sub folder. writing action allowed only in /data and its-sub folders

AT#M2MMKDIR=/myfolder

OK

AT#M2MMKDIR="/myfolder/mySubfolder"

OK

AT#M2MCHDIR="/myfolder/mySubfolder"

OK

AT#M2MMKDIR=newFolder

OK

AT#M2MCHDIR="/myfolder/mySubfolder/newFolder"

OK

Not Subject to NDA

3.27.4. AT#M2MBACKUP - M2M Set Backup Feature

This command manages the M2M File System and backup partition.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#M2MBACKUP=<enable>

Set command sets/resets the backup status of the executable binary file. Only the first starting file will be saved in backup partition.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	set/reset the BACKUP permission

Values:

0 : resets BACKUP status and backup partition

1 : sets BACKUP status and backup will be performed after reboot

AT#M2MBACKUP?

Read command reports the BACKUP status. The report has the following format:

#M2MBACKUP: <enable>

AT#M2MBACKUP=?

Test command returns the allowed values for parameter <**enable**>.

Not Subject to NDA

Set BACKUP status
AT#M2MBACKUP=1
OK

Check what is the BACKUP status value.
AT# M2MBACKUP?
M2MBACKUP: 1
OK

Not Subject to NDA

3.27.5. AT#M2MRMDIR - M2M File System Remove Directory

This command removes a directory in the M2M file system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MRMDIR=<directory_name>

Set command deletes a specified directory in current directory (see **#M2MCHDIR**) or a directory in a specified path.

Parameter:

Name	Type	Default	Description
<directory_name>	string	-	can be: - full directory path name starting with "/" - relative directory path name - directory name (in current directory)

- Maximum full directory length is 128 chars, maximum folder name is 64 chars
- If **<directory_name>** is not present an error code is reported
- **<directory_name>** is case sensitive
- **<directory_name>** can be equivalently enclosed on quote or not
- To be removed, the **<directory_name>** must be empty otherwise an error is returned

Not Subject to NDA

AT#M2MRMDIR=?

Test command returns OK.

AT#M2MRMDIR=dir1

OK

"/myfolder" must be "/data" or its sub folder

AT#M2MRMDIR="/myfolder/dir2"

OK

AT#M2MCHDIR="/myfolder"

OK

AT#M2MRMDIR="mySubfolder/dir3"

OK

Not Subject to NDA

3.27.6. AT#M2MRUN - M2M Set Run File Permission

This command manages the run permissions and control of the applications

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MRUN=<mode>[,<file_bin>[,<delay>]]

Set command sets/resets the RUN file permission and the delay start of the executable binary files with ".bin" extension, stored in the directory /data/azc/mod. It supports the multi-app feature.

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	set/reset the RUN file permission Values: 0÷2 : Boot mode: it takes effect after next reboot, see Additional info section, see Additional info section 3÷5 : Immediate mode: it immediately takes effect (start\stop), see Additional info section
<file_bin>	string	-	executable file name for which you set the RUN file permission, its format is a quoted or unquoted string (max 64 chars, case sensitive). File name extension must be .bin. If parameter is not present, the setting is applied to all executable files.
<delay>	integer	0	is the delay parameter if the is present, otherwise it effects all the executables present in the /data/azc/mod directory. Delay is relative to AppZone engine start which is in turn delayed by +M2M command setting. Depending on selected two different

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delays have effects, see Additional info section

Value:

0÷60 : range of the delay expressed in seconds

Additional info:

- The boot modes =0, =1 and =2 have effect after next reboot.

  * **AT#M2MRUN=0**

    NO RUN permission for all executables *.bin files in "/data/azc/mod "

  * **AT#M2MRUN=1**

    RUN permission for all executables *.bin files in "/data/azc/mod "

  * **AT#M2MRUN=2,"app2.bin"**

    Exclusive RUN permission: if file exist, set "/data/azc/mod/app2.bin" as executable and

    provides RUN permission only for it. Current delay not changed or set to default 0 if not still an executable.

  * **AT#M2MRUN=1,,10**

    RUN permission with delay =10 sec for all executable *.bin

  * **AT#M2MRUN=1,"app2.bin"**

    RUN permission for "/data/azc/mod/app2.bin" if it exists, current delay not changed or set to default 0 if not still an executable

  * **AT#M2MRUN=1,"app3.bin",0**

    RUN permission for "/data/azc/mod/app3.bin" if it exists, delay set to 0

  * **AT#M2MRUN=0,"app2.bin",0**

    NO RUN permission for "/data/azc/mod/app2.bin", delay set to 0.

    The RUN permission of all other *.bin files are not changed

Not Subject to NDA

▶▶ The immediate modes **<mode>**=3, **<mode>**=4 and **<mode>**=5 have immediate effect.

"in place" used hereafter means without reboot needed.

After exclusive load (**<mode>**= 5) the other executables than the selected one, are immediately stopped with 0 delay, but their own previous immediate delay are preserved.

* **AT#M2MRUN=3**

  in place stop of all apps in running with their last set immediate delay.

  In case of error the command will try in any case to stop as many executables as possible

* **AT#M2MRUN=3,,20**

  in place stop of all apps after 20 seconds of delay

* **AT#M2MRUN=3,"app2.bin"**

  in place stop of app2.bin, after its own last volatile delay

* **AT#M2MRUN=3,"app2.bin",0**

  immediate stop of app2.bin

* **AT#M2MRUN=3,"app2.bin",10**

  in place stop of app2.bin after 10 seconds

* **AT#M2MRUN=4**

  in place start of all apps if not already in running.

  The current immediate delays are used. In case of error, will try to start in any case as many executables as possible

* **AT#M2MRUN=4,,20**

  in place start of all apps if not already in running after 20 seconds for all

* **AT#M2MRUN=4,"app2.bin"**

  in place start of app2.bin if not already in running with the current immediate delay

* **AT#M2MRUN=4,"app2.bin",10**

  in place start of app2.bin if not already in running after10 seconds

Not Subject to NDA

* AT#M2MRUN=5,"app2.bin"

immediate stop of all apps in running, and in place start of app2.bin, if not already in running, after its own current immediate delay

* AT#M2MRUN=5,"app2.bin",0

immediate stop of all apps in running, and immediate start of app2.bin with no delay, if not already in running

* AT#M2MRUN=5,"app2.bin",10

immediate stop of all apps in running, and in place load of app2.bin, if not already in running, after 10s delay

▶▶ Depending on selected two different delays have effects.

1. Boot mode: in this mode both "boot" and "immediate" delays are affected:

if **<delay>** not provided:

delays are not changed from their previous configured values. Default values are 0.

if **<delay>** provided:

delays are set accordingly

2. Immediate mode: in this mode only "immediate" delay is set:

if **<delay>** not provided:

"immediate" delay is not changed from its previous configured value.

if **<delay>** provided:

"Immediate" delay is set accordingly.

See special case for =5 in additional info.

Not Subject to NDA

Parameters setting provided **<mode>** with in boot mode range is saved on "/mod/appcfg.ini" file

Executables are binary files with ".bin" extension saved in "/mod" directory which RUN permission has been set by **#M2MRUN** command.

The integrity check is performed internally.

AT#M2MRUN?

Read command reports the executables properties. The report has the following format

#M2MRUN: <app1.bin,run1,delay1,state1,va1,ram1>
#M2MRUN: <app2,bin,run2,delay2,state2,va2,ram2>
...
#M2MRUN: <appN,bin,runN,delayN,stateN,vaN,ramN>

Additional info:

Here are the parameters meanings.

Name	Type	Default	Description
<appN.bin>	string	-	executable name
<runN>	integer	N/A	executable run boot property Values: 0 : do not start after reboot 1 : auto start after reboot
<delayN>	integer	-	executable boot delay
<stateN>	integer	0	executable run state

Not Subject to NDA

Values:

0 : ready

1 : starting (not yet in running)

2 : running

3 : stopping (still in running)

4 : stopped (has been stopped, can be restarted)

<vaN>	hex	-	load virtual address of executable
<ramN>	integer	-	ram usage of executable if it is running.

AT#M2MRUN? will reflect executable removal from file system:

* Immediately if not in running
* After stop of the executable if in running

LE910Cx Linux product show ram usage as zero if it's not running.

AT#M2MRUN=?

Test command returns the values range of the **<mode>** parameter, the maximum number of

characters of the **<file_bin>** parameter and the values range for the <delay> parameter. The

format is:

#M2MRUN: (0-5),64,(0-60)

Not Subject to NDA

3.27.7. AT+M2M - Enable/disable M2M Application execution

This command enable/disable the M2M Application execution start mode

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT+M2M=<mode>[,<delay>]

Set command sets the M2M Application start mode. After issuing the AT command, the module automatically restart.

Parameters:

Name	Type	Default	Description
<mode>	integer	1	M2M application execution start mode Values: 0 : AppZone engine does not start at the next reboot 1 : AppZone engine starts at the next reboot without delay. Only apps with AT#M2MRUN=1 will start after reboot, with their specific delay setting. 4 : AppZone engine starts at the next reboot using the delay set by <delay> parameter, if missing is used the default value 10.
<delay>	integer	10	M2M application execution start time-out expressed in seconds. Parameter is used only if parameter is set to 4. Values: 0 : no delay for AppZone engine to start 1÷60 : delay for AppZone engine to start. During this waiting time an AT command on the serial/USB

Not Subject to NDA

port can disable the AppZone engine, and it will not start until the next reboot.

AT+M2M?

Read command reports the M2M application execution start mode, start time-out and start shell in the format:

+M2M: <mode>,<delay>

AT+M2M=?

Test command returns the range of available values for parameters **<mode>** and **<delay>**

Not Subject to NDA

3.27.8. AT#M2MATP - M2M AT Parser

This command enable/disable M2M AT Parser and M2M AT command set

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#M2MATP=<mode>

Set command enable or disable M2M AT Parser and M2M AT command set

Parameter:

Name	Type	Default	Description
<mode>	integer	1	enable or disable M2M AT parser and M2M AT command set Values: 0 : disable 1 : enable

If it configured, successfully, the device will reboot, automatically.

If it disabled, M2M AT command set are not available, below

+M2M	#M2MRUN	#M2MLIST	#M2MREAD	#M2MREADEXT
#M2MWRITE	#M2MDEL	#M2MMKDIR	#M2MRMDIR	#M2MCHDIR
#M2MBACKUP	#M2MRAM	#M2MARG	#TRACE	#DTR
#PSMCTS	#NTP	#NTPCFG	#PSMURC	#OTAUPW

Not Subject to NDA

AT#M2MATP?

Read command return current M2M AT parser mode

AT#M2MATP=?

Test command return the supported ranges

Not Subject to NDA

3.27.9. AT#M2MWRITE - Write a File

This command stores a file in the file system.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MWRITE=<file_name>,<size>,<binToMod>

Execution command stores a generic file in the folder specified by **<file_name>** parameter.

The file should be sent using RAW ASCII file transfer, and hardware flow control should be used. After

command line is terminated with **<CR>**, the module prompts the following five-character sequence:

<CR>,<LF>,<greater_than><greater_than><greater_than> (see IRA 13, 10, 62, 62, 62)

then a file sized <size> bytes can be sent from TE.

The operations complete when all bytes are received. If writing ends successfully the response is

OK, otherwise, an error code is reported.

Parameters:

Name	Type	Default	Description
<file_name>	string	-	can be: - full file name path starting with "/" - relative file name path - file name (in current directory)
<size>	integer	-	file size
<binToMod>	string	-	if **<file_name>** is provided as filename with ".bin" extension, using **<binToMod>** set to 1, force the file to be

Not Subject to NDA

automatically written on "/mod" folder whichever is the current directory.

- Maximum full path length is 128 chars, maximum folder or file name is 64 chars. Overall max full file path is 128 + 64 = 192 chars.
- If the file **<file_name>** or its path is not present an error code is reported.
- **<file_name>** can be equivalently enclosed on quote or not.
- **<file_name>** and its path are case sensitive.
- Writing action allowed only in "/data" and its sub-directories. Other directories are used for read only

AT#M2MWRITE=?

Test commands returns **OK** result code.

Not Subject to NDA

Store "M2MAPZ.bin" file in "/data/azc/mod" folder.

AT#M2MWRITE="/data/azc/mod/M2MAPZ.bin",58044

>>> here receives the prompt; then type or send the file, sized 58044 bytes

OK

/myFolder must be /data folder or its-sub folder.

AT#M2MCHDIR=/myFolder

OK

Store "Readme.txt" file in "/myFolder" folder.

AT#M2MWRITE=Readme.txt,2128

>>> here receives the prompt; then type or send the file, sized 2128 bytes

OK

Store "APP.bin" file directly in "/data/azc/mod" folder using <binToMod> option.

AT#M2MWRITE="APP.bin",32562,1

>>> here receives the prompt; then type or send the file, sized 32562 bytes

OK

Not Subject to NDA

3.27.10. AT#M2MDEL - Delete File

This command deletes specified file stored in the File System

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MDEL=<file_name>

Set command removes the **<file_name>** in the file system.

Parameter:

Name	Type	Default	Description
<file_name>	string	-	can be: - full file path name starting with "/" - relative file path name - file name (in current directory)

Maximum full path length is 128 chars, maximum folder or file name is 64 chars. Overall max full file path is 128 + 64 = 192 chars.

If the file **<file_name>** or its path is not present an error code is reported.

<file_name> and its path are case sensitive

<file_name> can be equivalently enclosed on quote or not.

AT#M2MDEL=?

Not Subject to NDA

Test command returns **OK** result code.

Remove M2MAPZ.bin file in "/data/azc/mod" folder

AT#M2MDEL="/data/azc/mod/M2MAPZ.bin"

OK

/myFoler must be /data or its-sub folder

AT#M2MCHDIR=/myFolder

OK

AT#M2MDEL=mySubfolder/myFile.txt

OK

Not Subject to NDA

3.27.11. AT#M2MLIST - File System List

This command lists the contents of a folder in the File System.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MLIST[=<path>]

Execution command reports the list of directories and files stored in current directory of the file system (see **#M2MCHDIR** for current path) or in path specified by **<path>**.

The report is shown in Additional info section.

Parameter:

Name	Type	Default	Description
<path>	string	-	can be: - full directory path if starting with "/" - relative directory path name - directory name (in current directory)

Additional info:

Here is the report format:

[<CR><LF>#M2MLIST: <.>
<CR><LF>#M2MLIST: <..>]
[<CR><LF>#M2MLIST: <dir_name$_1$>...
[<CR><LF>#M2MLIST: <dir_name$_n$>]]
[<CR><LF>#M2MLIST: <file_name$_1$>,<size$_1$>...
[<CR><LF>#M2MLIST: <file_name$_n$>,<size$_n$>]]
<CR><LF>#M2MLIST: free bytes: <free_mem>

Name	Type	Default	Description

Not Subject to NDA

<.>	string	-	current directory
<..>	string	-	upper directory
<dir_name>	string	-	directory name, string type delimited by < and > (max 255 characters, case sensitive)
<file_name>	string	-	file name, quoted sting type (max 255 characters, case sensitive)
<size>	integer	-	size of file in bytes
<free_mem>	integer	-	size of available free memory in the current drive in bytes

- Maximum full directory length is 128 chars, maximum folder name is 64 chars.
- If **<path>** is not present an error code is reported.
- **<path>** is case sensitive.
- **<path>** can be equivalently enclosed on quote or not.
- Path separator must be "/".
- The current directory in M2M file system at every power on is **"/data/azc/mod".**

AT#M2MLIST=?

Not Subject to NDA

Test command returns **OK** result code.

Show the list of "/data/azc/mod" directory on M2M file system

AT#M2MLIST

#M2MLIST: <.>

#M2MLIST: <..>

#M2MLIST: "m2mapz.bin",58044

#M2MLIST: free bytes: 458752

OK

Show the list of "/data/azc/mod/dir1" directory on M2M file system

AT#M2MLIST=/data/azc/mod/dir1

#M2MLIST: <.>

#M2MLIST: <..>

#M2MLIST: free bytes: 458752

OK

Not Subject to NDA

3.27.12. AT#M2MREAD - Read File

This command reports the content of a file stored in the File System.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MREAD=<file_name>

Execution command reads the content of a generic file stored in the folder specified by <**file_name**> parameter. After command line is terminated with <**CR**>, the module prompts the following five-character sequence:

<CR><LF><less_than><less_than><less_than> (see IRA 13, 10, 60, 60, 60)

followed by the file content.

Parameter:

Name	Type	Default	Description
<file_name>	string	-	can be: - full file name path starting with "/" - relative file name path - file name (in current directory)

- Maximum full path length is 128 chars, maximum folder or file name is 64 chars. Overall max full file path is 128 + 64 = 192 chars.
- If the file **<file_name>** or its path is not present in the file system, an error code is reported.
- **<file_name>** and its path are case sensitive
- **<file_name>** can be equivalently enclosed on quote or not

Not Subject to NDA

AT#M2MREAD=?

Test command returns **OK** result code.

AT#M2MREAD="/xxfolder/config/config.txt"
<<< here receive the prompt; then the file is displayed, immediately after the prompt
OK

AT#M2MCHDIR="/xxfolder/azc"

OK

AT#M2MREAD=config/config.txt

<<< here receive the prompt; then the file is displayed, immediately after the prompt

OK

Not Subject to NDA

3.27.13. AT#M2MREADEXT - M2M Read File Extended

This command reports the content of a file stored in the File System.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MREADEXT=<file_name>[,<maxByte>[,<viewMode>[,<chunkPrint>]]]

Execution command reads the content of a generic file stored in the folder specified by **<file_name>** parameter. After command line is terminated with <CR>, the module prompts the following five-character sequence:

<CR><LF><less_than><less_than><less_than> (see IRA 13, 10, 60, 60, 60)

followed by the file content.

Parameters:

Name	Type	Default	Description
<file_name>	string	-	can be: - full file name path starting with "/" - relative file name path - file name (in current directory)
<maxByte>	integer	0	maximum number of bytes to read Value: 0÷4096 : maximum number of bytes to read
<viewMode>	integer	N/A	enable/disable verbose mode Values: 0 : text format 1 : hexadecimal format

Not Subject to NDA

<chunkPrint>	integer	0	chunk print mode

Values:

0 : print whole file content at once or one <maxByte> and exit

1 : print one < maxByte > and wait for <CR> char to continue

<maxByte>=0 and **<chunkPrint>**=1 combination is not allowed.

Maximum full path length is 128 chars, maximum folder or file name is 64 chars. Overall max full file path is 128 + 64 = 192 chars.

If the file **<file_name>** or its path is not present in the file system, an error code is reported.

<file_name> and its path are case sensitive.

<file_name> can be equivalently enclosed on quote or not.

When printing the file content in **<maxByte>** chunks, omit the **<file_name>** on all subsequent AT command executions. Check code examples for further details.

AT#M2MREADEXT=?

Test command returns **OK** result code.

Not Subject to NDA

AT#M2MREADEXT="/xxfolder/config/config.txt"

<<< here receives the prompt and then the file content is displayed immediately after the prompt

OK

AT#M2MCHDIR="/xxfolder"

OK

AT#M2MREADEXT=config/config.txt

<<< here receives the prompt and then the file content is displayed immediately after the prompt

OK

Single chunk print mode:

AT#M2MREADEXT=config/config.txt,1000

<<< here receives the prompt; then the first 1000 bytes after the prompt

OK

AT#M2MREADEXT=,1000

<<< here receives the prompt and the subsequent 1000 bytes after the prompt.

OK

AT#M2MREADEXT=,1000 continue until the end of the file

<<< here receives the prompt and the subsequent 1000 bytes after the prompt.

OK

Continuous chunk print mode:

AT#M2MREADEXT=config/config.txt,1000,0,1

<<< here receives the prompt (only once) and the subsequent 1000 bytes after the prompt.

The **<CR>** char triggers the next print of 1000 bytes.

The **OK** is printed once the whole file content has been printed.

OK

Not Subject to NDA

3.27.14. AT#M2MRAM - AppZone RAM Info

The execution command returns information on RAM memory for AppZone applications.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#M2MRAM

The execution command response is in the format:

#M2MRAM: <totRam>,<availRam>

Additional info:

Here are the parameters meanings.

Name	Type	Default	Description
<totRam>	integer	-	total RAM for AppZone application space in bytes
<availRam>	integer	-	current available RAM for AppZone applications in bytes

AT#M2MRAM=?

Test command returns the **OK** result code.

Get information about AppZone applications RAM memory.

```
AT#M2MRAM
#M2MRAM: 2064376,1503216
OK
```


Not Subject to NDA

3.28. GNSS

3.28.1. GNSS Configuration

3.28.1.1. AT$LCSSLP - Update SLP Address

Update the SLP address.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LCSSLP=<slpAddressType>[,<slpAddress>[,<slpPortNumber>]]

Set command allows to update the SLP address and SLP port number.

Parameters:

Name	Type	Default	Description
<slpAddressType>	integer	1	SLP address type Values: 0 : IPv4 1 : FQDN 2 : Delete SLP address 3 : IPv6
<slpAddress>	string	-	SLP address in FQDN, IPv4 or IPv6 format
<slpPortNumber>	integer	-	SLP port number. Default value is 0.

If **<slpAddressType>** is 0, 1 or 3, then **<slpAddress>** is a mandatory parameter.

Not Subject to NDA

Other types of address are erased during set command.

The default value is following for China variants,

- CN_MOBILE / CN_UNICOM: 1,supl.google.com,7275

AT$LCSSLP?

Read command returns the current SLP parameters, in the format:

$LCSSLP: <slpAddressType>,<slpAddress>,<slpPortNumber>

AT$LCSSLP=?

Test command returns the supported values of parameter **<slpAddressType>**.

Not Subject to NDA

3.28.1.2. AT$LCSTER - Update Terminal Information

This command updates the terminal information like IMSI, MSISDN or IPv4 address.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$LCSTER=<idType>[,<idValue>[,<prefPosMode>[,<tlsMode>]]]

Set command updates the terminal information like IMSI, MSISDN or IPv4 address.

Parameters:

Name	Type	Default	Description
<idType>	integer	1	a number which can have any of the following values Values: 0 : MSIDSN 1 : IMSI 2 : IPv4 address 3 : invalid
<idValue>	string	-	a string, as defined in **<idType>**
<prefPosMode>	integer	0	preferred position mode Values: 0 : default position mode 1 : none preferred position mode
<tlsMode>	integer	1	indicates if TLS mode should/should not be used by the SET Values:

Not Subject to NDA

0 : non-TLS mode

1 : TLS mode

If <**idType**> is MSISDN or IPv4 address, then <**idValue**> shall be entered.

The <**id_type**>, <**id_value**> and <**pref_pos_mode**> isn't supported. It has no effect and is included only for backward compatibility.

Not Subject to NDA

3.28.1.3. AT$LICLS - Enable/Disable Unsolicited Response

This command enables the **$LICLS:** unsolicited response.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LICLS=<mode>

Set command enables/disables the unsolicited **$LICLS:** response. The unsolicited result code is in the format:

$LICLS: <requestType>[,<cid>]

Parameter:

Name	Type	Default	Description
<mode>	integer	1	unsolicited response mode Values: 0 : disable unsolicited 1 : enable unsolicited

Unsolicited fields:

Name	Type	Description
<requestType>	integer	If the <**requestType**> is a setup request, the unsolicited indication is sent/used to request the client to define, setup, activate and prepare the PDP context. If <**requestType**> 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

Not Subject to NDA

		associated terminal is not used anymore and shall be deactivated. Values: 0 : Setup Request to setup the control link 1 : Release Request to release the control link
<cid>	integer	Id associated to the context that shall be deactivated (see **+CGDCONT**)

AT$LICLS?

Read command returns the current value of parameter <**mode**>.

AT$LICLS=?

Test command returns the range of values for parameter <**mode**>.

Not Subject to NDA

3.28.1.4. AT$LTC - LCS Certificate

This command is used to pass the security objects (e.g. certificate, key) to the Transport Layer Security Protocol, via binary string.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	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).

Parameters:

Name	Type	Default	Description
<string>	string	-	string certificate segment. The maximum value of accepted characters is 300 characters per segment.
<total_message_length>	integer	N/A	total certificate size to be received Value: 1÷4096 : overall number of Certificate characters
<seq_no>	integer	N/A	sequence number of the segment Value: 1÷13 : sequence number
<security_object_type>	integer	0	security object typology. Value:

Not Subject to NDA

0 : Root Certificate

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**>.

The last two certificates are stored in NVM.

Not Subject to NDA

3.28.1.5. AT$LCSLK - Lock Context for LCS Use

The command is used to reserve or release a cid for LCS Location Services

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LCSLK=<mode>[,<cid>]

Set command is used to reserve a specified cid or release the current cid for LCS Location Services.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	Lock a specified cid / Unlock the current cid Values: 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>	integer	-	specifies a PDP context definition (see **+CGDCONT** command).

The **<cid>** is mandatory if **<mode>** is set to lock, otherwise shall be omitted

The set command returns **ERROR** if the current cid and/or the previously set are in use

If **<mode>** is set to unlock, The CID shouldn't be specified. Locked one will be released automatically.

Not Subject to NDA

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**>.

Not Subject to NDA

3.28.1.6. AT$GPSQOS - GPS Quality of Service

This command configures the GPS Quality of Service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT$GPSQOS=[<horiz_accuracy>[,<vertic_accuracy>[,<rsp_time>[,<age_of_location_info>[,<location_type>[,<nav_profile>[,<velocity_request>]]]]]]]

Set command used to set the GPS Quality of Service (QoS).

Parameters:

Name	Type	Default	Description
<horiz_accuracy>	integer	1800000	horizontal accuracy (in meter)

Values:

0÷50 : 50m; 0 is highest accuracy.

51÷500 : 500m

501÷1800000 : 1km; 1800000 is lowest accuracy

<vertic_accuracy>	integer	990	vertical accuracy

Value:

0÷990 : 0 is highest accuracy, 990 is lowest accuracy (in meters)

<rsp_time>	integer	14400	response time

Value:

Not Subject to NDA

	0÷14400 : 0 is the low delay and 14400 is the highest delay in seconds		
<age_of_location_info>	integer	0	maximum age of location
	Value: 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>	integer	0	type of location required. Used only in case of C-Plane
	Values: 0 : Current Location 1 : Current or Last known location 2 : Invalid Location, indicates that this parameter shall not be used		
<nav_profile>	integer	0	navigation profile
	Values: 0 : Car navigation profile		

Not Subject to NDA

	1 : Personal profile 2 : Low speed profile 3 : Invalid profile, indicates that this parameter shall not be used		
<velocity_request>	integer	1	velocity information is needed.
	Values: 0 : FALSE 1 : TRUE; It is always supported with TRUE.		

The following parameters are included only for backward compatibility and have no effect.

<vertic_accuracy>, **<age_of_location_info>**, **<location_type>**, **<nav_profile>**, and **<velocity_request>**

The **<rsp_time>** is supported as 0-255. If **<rsp_time>** is bigger than 255 seconds, the value is supported as the highest 255 seconds.

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=?

Test command returns the list of supported QoS values for each field.

Not Subject to NDA

$GPSQOS: (0-1800000),(0-990),(0-14400),(0-1966020),(0-2),(0-3),(0,1)

The current setting is stored through **$GPSSAV**.

</>

AT$GPSQOS=1800000,990,150,0,0,0
OK

Not Subject to NDA

3.28.1.7. AT$GNSSCONST - GNSS constellations configuration

This command handles the configuration of the constellations to be used for the solution.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GNSSCONST=<mask>

Parameter:

Name	Type	Default	Description
<mask>	hex	1F	The **<mask>** value defines which constellations will be used for the solution. The default value is 1F (all enabled). GPS and QZSS constellation are always active and bit 0 and 4 must always be set to 1. However, keep in mind that, although QZSS is used as augmentation to other GNSS systems, the device does not provide NMEA data.

Value:

11÷1F : Bitmap mask - see Additional info

Additional info:

▸▸ Bitmap description of the **<mask>** parameter:

<mask>	Constellations
Bit 0	reserved, set it to 1
Bit 1	GLONASS
Bit 2	GALILEO
Bit 3	BEIDOU
Bit 4	reserved, set it to 1

Not Subject to NDA

Bit 5	reserved, set it to 0
Bit 6	reserved, set it to 0
Bit 7	reserved, set it to 0

A reboot is needed for the setting to take effect.

AT$GNSSCONST?

Read command returns the active and requested configuration for GNSSCONST.

$GNSSCONST: <active>,<requested>

Additional info:

Below the meanings of <**active**> and <**requested**> parameters:

Name	Type	Default	Description
<active>	integer	-	value showing the current active status
<requested>	integer	-	value showing the requested status that will be activated on the next power ON

AT$GNSSCONST=?

Test command returns the supported range of values for <**mask**>.

Not Subject to NDA

Get active value and requested value

AT$GNSSCONST?

$GNSSCONST: 1F,1F

OK

Enable GPS + GALILEO + BEIDOU

AT$GNSSCONST=1D

OK

Until a reboot is done, the active value remains and the requested value changes

AT$GNSSCONST?

$GNSSCONST: 1F,1D

OK

A reboot is needed for the changes to take effect (requested value will become the active value)

AT#REBOOT

OK

Active value is now the previous requested value

AT$GNSSCONST?

$GNSSCONST: 1D,1D

OK

Not Subject to NDA

3.28.1.8. AT$GPSSTOP - Stop Location Service Request

This command is used to stop location service request.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT$GPSSTOP=<abort_cause>

Set command stops the Receiver in Autonomous or A-GPS mode initiated through **$GPSSLSR** set command.

Parameter:

Name	Type	Default	Description
<abort_cause>	integer	1	set abort cause
	Values: 0 : user denies the request 1 : unspecified cause for abort 2 : cause Invalid		

The **<abort_cause>** can be recovered by **$GPSRST**.

The current setting is stored through **$GPSSAV**.

The **<abort_cause>** option isn't supported. It has no effect and is included only for backward compatibility.

AT$GPSSTOP?

Not Subject to NDA

Read command returns the current value of parameter <**abort_cause**>.

AT$GPSSTOP=?

Test command returns **OK** result code.

Not Subject to NDA

3.28.1.9. AT$GPSSLSR - Start Location Service Request

Command used to start the Receiver in Autonomous or A-GPS mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT$GPSSLSR=<transport_protocol>[,<pos_mode>[,<client_id>,<clientid_type>[,<mlc_number>,<mlcnumber_type>[,<interval>[,<service_type_id>[,<pseudonym_indicator>]]]]]]

Execution command configures location service request.

Parameters:

Name	Type	Default	Description
<transport_protocol>	integer	2	Configure transport protocol. If <**pos_mode**> is Autonomous the <**transport_protocol**> should be invalid. If <**transport_protocol**> is C-plane and <**pos_mode**> is Pure MS Assisted, then <**interval**> should be 0 (or omitted). Values: 0 : CPlane 1 : SUPL 2 : Invalid

Not Subject to NDA

<pos_mode>	integer	3	Configure MS Based mode. If <**pos_mode**> is Autonomous the <**transport_protocol**> should be invalid. Values: 0 : Pure MS Assisted - Location estimate from the network (MS Assisted mode) 1 : MS Based - Assistance Data from the network (MS Based mode) 2 : Not supported 3 : Autonomous – Autonomous GPS mode of operation
<client_id>	string	-	String parameter containing the ID of the LCS-Client to which the location estimate is to be transferred. Max length is 64 bytes. <**client_id**> is mandatory in case of A-GPS and the <**transport_protocol**> should be C-plane.
<clientid_type>	integer	N/A	Configure client ID type. <**client_id**> and <**clientid_type**> are

Not Subject to NDA

			mandatory for A-GPS mode. Values: 0 : MSISDN 1 : Invalid
<mlc_number>	string	-	String parameter containing the address of the GMLC through which the location estimate is to be sent to the LCS-Client. <**mlc_number**> is mandatory in case of A-GPS.
<mlcnumber_type>	integer	N/A	Configure mlc type. <**mlc_number**> and <**mlcnumber_type**> are mandatory for A-GPS mode. Values: 0 : MSISDN 1 : Invalid
<interval>	integer	1	Configure interval period. If this value is not set, it is assumed to be 0. The Unsolicited NMEA sentences have to be enabled with the

Not Subject to NDA

			commands $GPSNMUN.
			Value: 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
<service_type_id>	integer	255	Configure service type id. **<service_type_id>** is mandatory in case of A-GPS. Value: 0÷255 : where 255 indicates that this parameter shall not be used
<pseudonym_indicator>	integer	N/A	Enable/disable display user name. Values: 0 : display user name at the external client 1 : display user name as anonymous at the external client

Additional info:

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

Not Subject to NDA

$GPSSLSR: SUPL/C-PLANE ERROR, <error_code>

<error_code>	
0	Phone Offline
1	No service
2	No connection with PDE
3	No data available
4	Session Manager Busy
5	Phone is CDMA locked
6	Phone is GPS locked
7	Connection failure with PDE
8	PDSM Ended session because of Error condition
9	User ended the session
10	End key pressed from UI
11	Network Session was ended
12	Timeout (viz., for GPS Search)
13	Conflicting request for session and level of privacy
14	Could not connect to the Network
15	Error in Fix
16	Reject from PDE
17	Ending session due to TC exit
18	Ending session due to E911 call
19	Added protocol specific error type
20	Ending because BS info is stale
21	VX lcs agent auth fail
22	Unknown System Error
23	Unsupported Service
24	Subscription Violation
25	The desired fix method failed
26	Antenna switch
27	No fix reported due to no tx confirmation rcvd
28	Network indicated a Normal ending of the session
29	No error specified by the network
30	No resources left on the network
31	Position server not available
32	Network reported an unsupported version of protocol
33	MOLR System failure
34	MOLR Unexpected data value

Not Subject to NDA

35	MOLR Data missing
36	MOLR Facility Not Supported
37	MOLR Subscription Violation
38	MOLR Position Method Failure
39	MOLR Undefined

If <**pos_mode**> is Autonomous, the <**transport_protocol**> should be invalid.

If <**transport_protocol**> is C-plane and <**pos_mode**> is Pure MS Assisted, then <**interval**> should be 0 (or omitted).

If <**interval**> is not set, it is assumed to be 0.

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

The following parameters are included only for backward compatibility and have no effect.

<**client_id**>, <**clientid_type**>, <**mlc_number**>, <**mlcnumber_type**>, <**service_type_id**> and <**pseudonym_indicator**>

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=?

Returns the list of supported SLSR values for each field.

Not Subject to NDA

$GPSSLSR: (0-2),(0-3),(64),(0,1),(64),(0,1),(0-7200),(0-255),(0,1)

The current setting is stored through **$GPSSAV**.

AT$GPSSLSR= 2,3,,,,,1
OK

Not Subject to NDA

3.28.1.10. AT$SUPLV - Set the Version of the Supported SUPL

This command configures the version of supported SUPL.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$SUPLV=<version>

Set command configures the version of supported SUPL.

Parameter:

Name	Type	Default	Description
<version>	integer	2	set the SUPL version. Values: 0 : N/S SUPL 1 : SUPL 1.0 2 : SUPL 2.0

AT$SUPLV?

Read command returns the SUPL version, in the format:

$SUPLV: x.y

Where "x.y" is the string corresponding to currently set version, or "0.0" if version has not been set yet.

AT$SUPLV=?

Not Subject to NDA

Test command returns the supported range of values of parameter <**version**>.

$SUPLV: (0-2)

AT$SUPLV=1
OK

AT$SUPLV?
$SUPLV:1.0
OK

Not Subject to NDA

3.28.1.11. AT$SLP - Update SLP Address

This command allows updating the SLP parameters.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$SLP=<slp_address_type>[,<slp_address:slp_port_number>]

Set command allows updating the SLP address and SLP port number.

Parameters:

Name	Type	Default	Description
<slp_address_type>	integer	1	SLP address type Values: 0 : IPv4 1 : FQDN 3 : IPv6

If <**slp_address**> is omitted, chosen <**slp_address_type**> will be deleted.

IPv6 is passed in the following format:
AT$SLP=3,"[2001:db8:255::8:7]:7275"

The default value is following for China variants,

- CN_MOBILE/CN_UNICOM: "supl.google.com",7275

AT$SLP?

Not Subject to NDA

Read command returns the current SLP address <**slp_address**> and, if address is not empty, the <**slp_port_number**> port number, in the format:

$SLP: <slp_address>[,<slp_port_number>]

If the FQDN is empty. the <**slp_port_number**> value is 0

AT$SLP=?

Test command returns the range of values in the following format:

$SLP: (0,1,3),("IP,URL,IPv6")

Not Subject to NDA

3.28.1.12. AT$SLPTYPE - Update SLP Type Address

This command allows updating the SLP address type to be chosen.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$SLPTYPE=<slp_address_type>

Set command allows updating the SLP address type to be chosen.

Parameter:

Name	Type	Default	Description
<slp_address_type>	integer	1	SLP address type. This parameter also updates during **$SLP** set command. Values: 0 : IPv4 1 : FQDN 3 : IPv6

AT$SLPTYPE?

Read command returns the current SLP address type.

AT$SLPTYPE=?

Test command returns the range of values in the following format:

$SLPTYPE: (0,1,3)

Not Subject to NDA

3.28.1.13. AT$SUPLCFG - Configure SUPL TLS and Hash

This command permits to configure the SUPL TLS and Hash algorithm version.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$SUPLCFG=<tls>[,<hash>]

Set command configures the SUPL TLS and Hash algorithm version.

Parameters:

Name	Type	Default	Description
<tls>	integer	1	selects TLS version. Values: 0 : use TLS v.1.0 1 : use TLS v.1.1
<hash>	integer	1	selects SHA version. Values: 0 : use SHA-1 1 : use SHA-256

AT$SUPLCFG?

Read command reports the currently selected <tls> and <hash> in the format:

$SUPLCFG: <tls>,<hash>

Not Subject to NDA

AT$SUPLCFG=?

Test command reports the supported range of values for parameters: <**tls**> and <**hash**>.

Not Subject to NDA

3.28.1.14. AT$LCSLUI - Update Location Information

Set command allows updating the Location information.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LCSLUI=<update_type>

Parameter:

Name	Type	Default	Description
<update_type>	integer	1	Current access technology
	Values:		
	0 : GSM		
	1 : WCDMA		

The current access technology can be read with **+COPS?**.

This command has no effect and exists only for backward compatibility.

AT$LCSLUI=?

Test command returns the range of values for parameter.

Not Subject to NDA

3.28.1.15. AT$SUPLSEC - Set the User Plane Secure Transport

This command configures the User Plane Secure Transport

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$SUPLSEC=<option>

Set command configures the User Plane Secure Transport

Parameter:

Name	Type	Default	Description
<option>	integer	1	enables/disables User Plane Secure Transport. Values: 0 : disable 1 : enable

AT$SUPLSEC?

Read command returns the currently used values, in the format:

$SUPLSEC: <option>

AT$SUPLSEC=?

Test command returns the supported range of values of parameters <option>.

$SUPLSEC: (0-1)

Not Subject to NDA

```
AT$SUPLSEC=1
OK

AT$SUPLSEC?
$SUPLSEC: 1
OK
```


Not Subject to NDA

3.28.1.16. AT$AGPSEN - Set GNSS capability supporting to module

This command set GNSS capability supporting to module.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$AGPSEN=<mode>

Set command sets GPS/A-GPS/A-GLOASS capability supporting on the module.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	GNSS capability

Values:

0 : Standalone GPS only

1 : Full GPS capability (Standalone GPS, A-GPS)

2 : Full GPS (Standalone GPS, A-GPS) and A-GLONASS capability

3 : Not support GPS

The default value depends on operator.

For Fx980, LN920 series,

- Generic: **2**
- Others: **1**

AT$AGPSEN?

Not Subject to NDA

Read command returns the currently selected GNSS capability in the format:

$AGPSEN: <mode>

AT$AGPSEN=?

Test command reports the supported range of values for parameter(s) <mode>.

$AGPSEN: (the supported range of <mode>)

Not Subject to NDA

3.28.1.17. AT$LCSLPP - Set Configuration Information for LPP Protocol

This command sets the configuration information for LPP Protocol.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LCSLPP=<mode>

Set command sets the configuration information for LPP (LTE Poisoning Protocol).

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	configuration for LPP Values: 0 : RRLP in LTE 1 : LPP user plane in LTE 2 : LPP control plane in LTE 3 : LPP UP/CP in LTE

Not Subject to NDA

In LE910Cx series models, the default value depends on operator requirement.

- LE910C1-NA: 2
- LE910C1-NS: 3
- LE910Cx-AP: 1(KDDI), 3(Except for KDDI)
- LE910Cx-NF: 2(ATT), 3(VZW, TMO)
- LE910Cx-EU(X): 3
- LE910Cx-LA/CN: 2
- LE910C1-SV(X): 3
- LE910C1-ST: 3
- LE910C1-SA(X): 2
- LE910Cx-WWX: 3, 1(KDDI), 2(ATT)

AT$LCSLPP?

Read command returns the currently selected configuration for LPP protocol in the format:

$LCSLPP: <mode>

AT$LCSLPP=?

Test command reports the supported range of values for parameter(s) <mode>.

$LCSLPP: (the supported range of <mode>)

Not Subject to NDA

3.28.1.18. AT$LCSAGLO - Selection of Positioning protocols for A-GLONASS

This command set selection of positioning protocols (RRLP, RRC, LPP) for A-GLONASS.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LCSAGLO=<mask>

Set command sets the selection of positioning protocols for A-GLONASS.

Parameter:

Name	Type	Default	Description
<mask>	integer	0	protocol mask of A-GLONASS 0: Not selected 1: RRC control plane (In case AT&T, Default) 2: RRLP user plane 4: LPP user plane 8: LPP control plane

Value:

0÷15 : protocol mask of A-GLONASS

Not Subject to NDA

The default value depends on operator.

For LM9x0 / LE910Cx series,

- AT&T: 1
- Others: 0

For Fx980/LN920 series,

- AT&T: 1
- Generic: 15
- Others: 0

AT$LCSAGLO?

Read command returns the currently selected protocol mask of A-GLONASS in the format:

$LCSAGLO: <mask>

AT$LCSAGLO=?

Test command reports the supported range of values for parameter(s) <mask>.

$LCSAGLO: (the supported range of <mask>)

This command is only applicable for A-GLONASS capable setting. (see **$AGPSEN**)

The <mask> 4 and 8 must be set in the LPP configuration for this to take effect. (see **$LCSLPP**)

Not Subject to NDA

3.28.1.19. AT$GPSNHZ - GNSS Navigation Update Rate Configuration

This command set the GNSS Navigation Update Rate.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSNHZ=<update_rate>

Set command configures the GNSS Navigation Update Rate.

Parameter:

Name	Type	Default	Description
<update_rate>	integer	0	Navigation update rate Values: 0 : 1Hz (1000 milliseconds) 1 : 2Hz (500 milliseconds) 2 : 5Hz (200 milliseconds) 3 : 10Hz (100 milliseconds)

When the module starts position request, the real TBF (see **<interval>** of **$GPSSLSR**) is recalculated according to **$GPSNHZ** configuration.

The Start Location Request selects closest supported time interval for TBF. The method selects appropriate time interval in milliseconds for time between fixes.

When NHz setting is configured, the following values are allowed:

- **100** milliseconds - 10Hz rate, in case <**update_rate**>=3.
- **200** milliseconds - 5Hz rate, in case <**update_rate**>=2.
- **500** milliseconds - 2Hz rate, in case <**update_rate**>=1.

Not Subject to NDA

- N*1000 milliseconds - 1Hz rate and lower with one second boundaries, in case <update_rate>=0.

All intervals are rounded down to the nearest supported value if they are lower than 1000 ms.

*Time interval in milliseconds = Round down(<interval> of $GPSSLSR * NHz interval(milliseconds)).*

For example,

AT$GPSNHZ=3

OK

AT$GPSNHZ?

$GPSNHZ: 3

OK

Rounded down to the nearest supported value:

AT$GPSSLSR=2,3,,,,,1 (100 = 100 milliseconds *1)

OK

$GPRMC,045212.00,A,3731.303808,N,12655.778005,E,0.0,0.0,010219,6.1,W,A,V*5F

$GPRMC,045212.10,A,3731.303808,N,12655.778005,E,0.0,0.0,010219,6.1,W,A,V*5E

AT$GPSSLSR=2,3,,,,,2 (200 = 100 milliseconds *2)

OK

$GPRMC,045516.00,A,3731.304115,N,12655.783014,E,0.0,0.0,010219,6.1,W,A,V*5A

$GPRMC,045516.20,A,3731.304055,N,12655.783031,E,0.0,0.0,010219,6.1,W,A,V*5A

AT$GPSSLSR=2,3,,,,,3 (200 = 100 milliseconds *3)

OK

$GPRMC,045259.00,A,3731.303742,N,12655.781811,E,0.0,0.0,010219,6.1,W,A,V*5A

$GPRMC,045259.20,A,3731.303731,N,12655.781815,E,0.0,0.0,010219,6.1,W,A,V*58

Not Subject to NDA

AT$GPSSLSR=2,3,,,,,**4** (**200** = 100 milliseconds *4)

OK

$GPRMC,045639.00,A,3731.303816,N,12655.782693,E,0.0,76.6,010219,6.1,W,A,V*66

$GPRMC,045639.20,A,3731.303823,N,12655.782711,E,0.0,76.6,010219,6.1,W,A,V*69

AT$GPSSLSR=2,3,,,,,**5** (**500** = 100 milliseconds *5)

OK

$GPRMC,050047.00,A,3731.303306,N,12655.778723,E,0.0,112.5,010219,6.1,W,A,V*58

$GPRMC,050047.50,A,3731.303306,N,12655.778724,E,0.0,112.5,010219,6.1,W,A,V*5A

AT$GPSSLSR=2,3,,,,,**9** (**500** = 100 milliseconds *9)

OK

$GPRMC,050144.00,A,3731.303373,N,12655.778759,E,0.0,112.5,010219,6.1,W,A,V*55

$GPRMC,050144.50,A,3731.303374,N,12655.778761,E,0.0,112.5,010219,6.1,W,A,V*5C

The values over 1000ms are rounded up to the next integer second interval.

*Time interval in milliseconds = Round up(<interval> of $GPSSLSR * NHz interval(milliseconds)).*

For example,

AT$GPSNHZ=3

OK

AT$GPSNHZ?

$GPSNHZ: 3

OK

Rounded up to the next integer second interval:

AT$GPSSLSR =2,3,,,,,**10** (**1*1000** = 100 milliseconds *10)

OK

Not Subject to NDA

$GPRMC,050303.00,A,3731.303960,N,12655.781347,E,0.0,112.5,010219,6.1,W,A,V*51

$GPRMC,050304.00,A,3731.303981,N,12655.781390,E,0.0,112.5,010219,6.1,W,A,V*53

AT$GPSSLSR =2,3,,,,,**12** (**2*1000** = 100 milliseconds *12)

OK

$GPRMC,050330.00,A,3731.303989,N,12655.781568,E,0.0,59.4,010219,6.1,W,A,V*62

$GPRMC,050332.00,A,3731.303989,N,12655.781567,E,0.0,59.4,010219,6.1,W,A,V*6

AT$GPSSLSR =2,3,,,,,**22** (**3*1000** = 100 milliseconds *22)

OK

$GPRMC,062748.00,A,3731.303291,N,12655.780885,E,0.0,108.0,010219,6.1,W,A,V*54

$GPRMC,062751.00,A,3731.303526,N,12655.781068,E,0.0,108.0,010219,6.1,W,A,V*5D

AT$GPSNHZ?

Read command returns the currently update rate setting , in the format

$GPSNHZ: <update_rate>

AT$GPSNHZ=?

Test command reports the range of supported values for parameter <update_rate>.

$GPSNHZ: (the supported range of <update_rate>)

Not Subject to NDA

3.28.1.20. AT$GPSELV - GNSS Minimum Elevation Level

This command set the GNSS minimum elevation level for SVs used in the position fix.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSELV=<elevation>

Set command to configure the GNSS minimum elevation level for SVs used in the position fix.

Parameter:

Name	Type	Default	Description
<elevation>	integer	5	GNSS minimum elevation level. where, 0 is lowest elevation level and 90 is highest elevation level in degrees. Value: 0÷90 : GNSS minimum elevation level.

AT$GPSELV?

Read command returns the GNSS elevation level, in the format:

$GPSELV: <elevation>

AT$GPSELV=?

Test command returns the supported range of values for parameter **<elevation>**.

Not Subject to NDA

- It does not recommend setting **<elevation>** less than 5 degrees.
- Device reboot is needed all the time after changing **<elevation>** value.

Not Subject to NDA

3.28.1.21. AT$GPSDTM - NMEA Datum Control Configuration

This command set the NMEA datum control configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSDTM=<datum>

Set command to configure the NMEA datum control.

Parameter:

Name	Type	Default	Description
<datum>	integer	0	NMEA datum Values: 0 : enable WGS84 1 : enable PZ90

AT$GPSDTM?

Read command returns the NMEA datum control configuration, in the format:

$GPSDTM: <datum>

AT$GPSDTM=?

Test command returns the supported range of values for parameter **<datum>**

Not Subject to NDA

3.28.1.22. AT$XTRAEN - GpsOneXTRA feature control

This command enables/disables the GpsOneXTRA Feature.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$XTRAEN=<mode>

Execution command set to control the GpsOneXTRA feature.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Control GpsOneXTRA feature. Values: 0 : Disable GpsOneXTRA feature 1 : Enable GpsOneXTRA feature

Additional info:

- When GpsOneXTRA feature is enabled:

  If standalone GNSS session is started and there is no XTRA assistance data file in device, The XTRA file downloading is triggered, and it always requires data service.

  An XTRA file contains orbit predictions for constellations, which are valid up to 7 days. With valid XTRA data present, a GNSS engine on modem can eliminate the need for GNSS navigation data demodulation over the air and reduce the time required for generating a position fix.

AT$XTRAEN?

Not Subject to NDA

Read command returns the values of saved GpsOneXTRA feature <mode>.

$XTRAEN: <mode>

AT$XTRAEN=?

Test command returns the supported range of values of parameters <mode>

$XTRAEN: (0,1)

- New setting is applicable across device power cycles.
- If gpsOneXTRA feature is enabled, the unintentional data usage can be occurred. Please set as disable if you want not to use this feature.

Not Subject to NDA

3.28.1.23. AT#GTPEN - Configure the GTP WWAN Service

This command set to configure the GTP (Global Terrestrial Positioning) WWAN service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#GTPEN=<enable>

Set command to configure the GTP (Global Terrestrial Positioning) WWAN Service.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	Configure the GTP WWAN Service
	Values:		
	0 : Disable		
	1 : Enable		

AT#GTPEN?

Read command returns the GTP (Global Terrestrial Positioning) WWAN Service configuration, in the format:

#GTPEN: <enable>

AT#GTPEN=?

Test command returns the supported range of values for parameter **<enable>**

Not Subject to NDA

The setting is saved in NVM and available on following reboot.

If the GTP (Global Terrestrial Positioning) WWAN service is enabled, the unintentional data usage can be occurred. Please set as disable if you want not to use this feature.

Enable

AT#GTPEN=1

OK

AT#REBOOT

OK

Disable

AT#GTPEN=0

OK

AT#REBOOT

OK

Read

AT#GTPEN?

#GTPEN: 0

OK

Test

AT#GTPEN=?

#GTPEN: (0-1)

OK

Not Subject to NDA

3.28.2. GNSS Receiver

3.28.2.1. AT$GPSAT - GNSS Antenna LNA Control

This command selects the GNSS antenna.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT$GPSAT=<type>

Set command selects the GNSS antenna. It is maintained for backward compatibility

Parameter:

Name	Type	Default	Description
<type>	integer	1	Antenna type

Values:

0 : GPS Antenna not power supplied by the module

1 : GPS Antenna power supplied by the module

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>**.

Not Subject to NDA

- The current setting is stored through **AT$GPSSAV**.
- This command has no real meaning. It exists for backward compatibility.

```
AT$GPSAT=1
OK
```


Not Subject to NDA

3.28.2.2. AT$GPSELNA - GNSS External LNA support

This command configures to support the GNSS external LNA.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSELNA=<mode>

Set command is used to enable/disable GNSS External LNA Support.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	GNSS External LNA Option Values: 0 : Not support GNSS External LNA 1 : Support GNSS External LNA

If **<mode>** is 0, GNSS RF receiver is high gain mode. If **<mode>** is 1, GNSS RF receiver is low gain mode.

If the GNSS external LNA isn't supported on H/W, please never set **<mode>**=1 (Support GNSS External LNA).

This setting is dependent on H/W Design.

AT$GPSELNA?

Read command returns the currently setting, in the format.

$GPSELNA: <mode>

Not Subject to NDA

AT$GPSELNA=?

Test command reports the range of supported values for parameter <mode>.

$GPSELNA: (the supported range of <mode>)

Not Subject to NDA

3.28.2.3. AT$GPSRST - Restore Default GNSS Parameters

This command resets the GNSS parameters to "Factory Default" configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSRST

Execution command resets the GNSS parameters to "Factory Default" configuration and stores them in the NVM of the device.

AT$GPSRST=?

Test command returns the **OK** result code.

The restored parameters are those of:

$GPSP, $GPSR, $GPSNMUN, $GPSNMUNEX, $GPSQOS, $GPSSLSR, $GPSSTOP and $GPSAT commands. (see their default value at each command description)

If the GPS controller is powered up (see **$GPSP**), the GNSS controller is powered down because the GNSS parameters should be reset with "Factory Default".

AT$GPSRST

OK

Not Subject to NDA

3.28.2.4. AT$GPSSAV - Save GNSS Parameters Configuration

This command stores the current GNSS parameters in the NVM of the device.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GPSSAV

Execution command stores the current GNSS parameters in the NVM of the device.

AT$GPSSAV=?

Test command returns the **OK** result code.

The saved parameters are those of:

$GPSP, $GPSR, $GPSNMUN, $GPSNMUNEX, $GPSQOS, $GPSSLSR, $GPSSTOP and $GPSAT commands.

AT$GPSSAV

OK

Not Subject to NDA

3.28.2.5. AT$GPSP - GNSS Positioning Session Control

This command controls the GNSS positioning session.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT$GPSP=<status>

The set command allows to control the GNSS positioning session.

Parameter:

Name	Type	Default	Description
<status>	integer	0	GNSS positioning session status Values: 0 : Stop GNSS positioning session 1 : Start GNSS positioning session

- This command only controls the started GNSS positioning session from **$GPSP** and **$GPSSLSR**. The GNSS positioning sessions of other Service (IMS, MDT or UIM) cannot be controlled.
- The Start GNSS positioning session clears GNSS memory and then powers up the GNSS receiver if it powers down. The GNSS data cleaning is performed on the base of the current value of the <**reset_type**> parameter (see **$GPSR**).
- The GNSS operation mode of Start GNSS positioning session is performed on the base of the current values of **$GPSSLSR** configuration (see **$GPSSLSR**).
- The **$GPSP** and **$GPSSLSR** cannot be used at same time.

Not Subject to NDA

AT$GPSP?

The read command reports the current value of the <**status**> parameter, in the format:

$GPSP: <status>

Where:

<**status**> - GNSS positioning session status

0 - GNSS positioning session is not working

1 - GNSS positioning session is working

AT$GPSP=?

The test command reports the supported values range for parameter **<status>**.

$GPSP: (0,1)

The current <**status**> value is stored through **$GPSSAV** command.

Start GNSS positioning session.

```
AT$GPSP=1
OK
```

Stop GNSS positioning session.

```
AT$GPSP=0
OK
```


Not Subject to NDA

3.28.2.6. AT$LOCMODE - GPS Location Request Mode

This command configures to enable GPS Location Request mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$LOCMODE=<mode>

This command executes the Location request for autonomous GPS.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	location request mode Values: 0 : Terminate autonomous GPS session 1 : Activate autonomous GPS session

AT$LOCMODE=?

Test command returns the current value of the location mode <**mode**>.

$LOCMODE: <mode>

This command is only applicable for **Sprint** version.

Not Subject to NDA

3.28.3. GNSS General Management

3.28.3.1. AT$GNSSSLCT - GNSS System Select

This command configures to set GNSS System Select.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GNSSSLCT=<gnss_conf>

Set command configures the GNSS receiver to look for the requested GNSS systems.

Parameter:

Name	Type	Default	Description
<gnss_conf>	integer	0	enumeration of GNSS configurations

Values:

0 : GNSS_ALL (gps+glonass+galileo+beidou)

1 : BDS_ONLY (gps+beidou)

2 : BDS_GAL (gps+galileo+beidou)

3 : GLO_BDS (gps+glonass+beidou)

4 : GAL_ONLY (gps + galileo)

5 : GLO_ONLY (gps + glonass)

6 : GLO_GAL (gps + glonass + galileo)

7 : GPS_ONLY (gps alone)

New <**gnss_conf**> takes effect only after power up or reboot.

Not Subject to NDA

AT$GNSSSLCT?

Read command returns the last set value, in the format:

$GNSSSLCT: <gnss_conf>

AT$GNSSSLCT=?

Test command reports the range of supported values for parameter <**gnss_conf**>.

$GNSSSLCT: (the supported range of <gnss_conf>)

- New <**gnss_conf**> takes effect only after power up or reboot
- There is mutual influence between this command and **$GPSGLO** command.
- The current setting is stored in NVM.

Not Subject to NDA

```
AT$GNSSSLCT?
$GNSSSLCT: 0   // GNSS_ALL

OK

// select gps+beidou

AT$GNSSSLCT=1
OK

AT#REBOOT
OK

// after power up

AT$GNSSSLCT?
$GNSSSLCT: 1    // gps+beidou

OK

// now gnss receiver will look for just gps and beidou systems

$GPSP=1
OK
```


Not Subject to NDA

3.28.3.2. AT$GPSDPO - Dynamic Power Optimization Control

This command configures the Dynamic Power Optimization (DPO) Control.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSDPO=<enable>

Set command configures the Dynamic Power Optimization (DPO) Control.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	DPO mode

Values:

0 : DPO shall be disabled

1 : DPO shall be enabled with dynamic duty cycle

2 : DPO shall be enabled only if device is not connected to an external power source (not running on battery)

AT$GPSDPO?

Read command returns the currently setting, in the format:

$GPSDPO: <enable>

AT$GPSDPO=?

Test command reports the range of supported values for parameter **<enable>**.

Not Subject to NDA

$GPSDPO: (the supported range of <enable>)

- DPO is enabled, GNSS 1PPS signal output is disabled.
- New setting is applicable across device power cycles.

Not Subject to NDA

3.28.3.3. AT$LOCATION - Enable Location Service

This command configures to enable Location Service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$LOCATION=<n>

This command enables/disables the Location Services inside the module.

Parameter:

Name	Type	Default	Description
<n>	integer	1	mode
	Values: 0 : Disable Location Services 1 : Enable Location Services		

AT$LOCATION=?

Reports the current value of the <n> parameter, in the format:

$LOCATION: <n>

This command is only applicable for **Sprint** version.

Not Subject to NDA

AT$LOCATION=?
$LOCATION: 0

OK

AT$LOCATION=1
OK

Not Subject to NDA

3.28.3.4. AT$GPSCLRX - Clear GPS Data

This command resets GPS data.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GPSCLRX

This command resets all GPS data listed below:

- GPS Almanac Data
- GPS Ephemeris Data
- LBS User Plane PDE IP Address
- LBS User Plane PDE IP Port

This command is global and cannot clear individual pieces of data.

AT$GPSCLRX=?

Test command returns the **OK** result code.

```
AT$GPSCLRX=?
OK

AT$GPSCLRX
OK
```


Not Subject to NDA

3.28.3.5. AT$GPSAV - GPS Antenna Supply Voltage Readout

This command returns the measured GPS antenna's supply voltage.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GPSAV

Execution command returns the measured GPS antenna's supply voltage in mV.

AT$GPSAV?

Read command has the same meaning as the execution command.

AT$GPSAV=?

Test command returns the **OK** result code

This command has no real meaning. It exists for backward compatibility.

Not Subject to NDA

3.28.3.6. AT$GPSR - Reset the GNSS Controller

This command resets the GNSS controller.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Other	No	-	2

AT$GPSR=<resetType>

Set command allows to reset the GNSS controller.

Parameter:

Name	Type	Default	Description
<resetType>	integer	3	set the type of GNSS controller reset.

Values:

0 : Factory Reset: this option clears all the GNSS 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 GNSS receiver including Position, Almanac, Ephemeris and Time. The stored Clock Drift is retained.

2 : Warmstart (No ephemeris): this option clears all initialization data in the GNSS 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 GNSS receiver restarts by using all data that is currently stored in the internal memory of the

Not Subject to NDA

	GNSS receiver: validated Ephemeris and Almanac.

Factory Reset performs the same operation as **Coldstart**.

<resetType> sets the kind of start when GNSS is activated through **$GPSP** command.

AT$GPSR?

Read command returns the currently used reset type, in the format:

$GPSR: <resetType>

AT$GPSR=?

Test command reports the range of supported values for parameter <**resetType**>.

The current setting is stored through **$GPSSAV** command.

Factory reset
AT$GPSR=0
OK

Not Subject to NDA

3.28.3.7. AT$GPSLOCK - GNSS Lock Mode

This command is used to configure the GNSS lock mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSLOCK=<mode>

Set command sets the GNSS lock mode.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Lock Mode

Values:

0 : GNSS Unlock

1 : Mobile-Initiated (MI) session is locked

2 : Mobile-Terminated (MT) session is locked

3 : Except for an emergency call, all (MI and MT) is locked

The default value depends on operator.

For Fx980 series,

- SKT: 3 (Some GNSS commands return ERROR. If GNSS fix should be used, please set 0 value to work GNSS)

- Others: 0

AT$GPSLOCK?

Read command returns the currently selected lock mode in the format:

Not Subject to NDA

$GPSLOCK: <mode>

AT$GPSLOCK=?

Test command reports the supported range of values for parameter(s) <mode>.

$GPSLOCK: (the supported range of <mode>)

During an emergency call, an MT session will always be permitted irrespective of the setting.

Not Subject to NDA

3.28.3.8. AT$GPSGLO - Set the GLONASS Capability

This command selects the GLONASS capability used.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT$GPSGLO=<type>

Set command selects the GLONASS capability used.

Parameter:

Name	Type	Default	Description
<type>	string	1	enables/disables GLONASS capability. Values: 0 : Disable GLONASS 1 : Enable GLONASS

This command is saved in NVM and has effect only at the next power cycle.

AT$GPSGLO?

Read command returns the currently used GLONASS, in the format:

$GPSGLO: <type>

AT$GPSGLO=?

Test command reports the range of supported values for parameter <type>.

Not Subject to NDA

```
AT$GPSGLO=1
OK
```


Not Subject to NDA

3.28.4. GNSS Positioning Information

3.28.4.1. AT$GPSNMUN - Unsolicited NMEA Data Configuration

Unsolicited NMEA data configuration

NMEA 0183 Standard

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GPSNMUN=<enable>[,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>]

Set command allows to activate an unsolicited GNSS data stream built with NMEA sentences on the standard serial port and defines which NMEA sentences will be available. Refer to document [1] to have information on the NMEA sentences contents and formats.

Parameters:

Name	Type	Default	Description
<enable>	integer	0	Enables unsolicited GNSS data stream and selects one of the available GNSS data stream format display. <**enable**> parameter is also used to disable the GNSS data stream. Here is the list of the <**enable**> values. See Additional info section to have information on GNSS data stream formats.

Values:

0 : disable GNSS data stream

1 : enable the first GNSS data stream format

2 : enable the second GNSS data stream format

Not Subject to NDA

			3 : enable the first GNSS data stream format, and reserve the AT interface port only for the GNSS data stream
<GGA>	integer	0	enables/disables the presence of the Global Positioning System Fix Data NMEA sentence (GGA) in the GNSS data stream. Values: 0 : disable 1 : enable
<GLL>	integer	0	enable/disable the presence of the Geographic Position - Latitude/Longitude NMEA sentence (GLL) in the GNSS data stream. Values: 0 : disable 1 : enable
<GSA>	integer	0	enable/disable the presence of the GNSS DOP and Active Satellites NMEA sentence (GSA) in the GNSS data stream. Values: 0 : disable 1 : enable
<GSV>	integer	0	enable/disable the presence of the Satellites in View NMEA sentence (GSV) in the GNSS data stream. Values: 0 : disable 1 : enable

Not Subject to NDA

<RMC>	integer	0	enable/disable the presence of the Recommended Minimum Specific GNSS Data NMEA sentence (RMC) in the GNSS data stream. Values: 0 : disable 1 : enable
<VTG>	integer	0	enable/disable the presence of the GNSS Course Over Ground and Ground Speed NMEA sentence (VTG) in the GNSS data stream. Values: 0 : disable 1 : enable

Additional info:

- <enable>=1, GNSS data stream format:

  $GPSNMUN: <NMEA SENTENCE 1><CR><LF>
  ...
  $GPSNMUN: <NMEA SENTENCE N><CR><LF>
  ...

- <enable>=2, GNSS data stream format:

  <NMEA SENTENCE 1><CR><LF>
  ...
  <NMEA SENTENCE N><CR><LF>
  ...

Not Subject to NDA

▶▶ <enable>=3, in this case, the AT interface port is dedicated to NMEA sentences, it is not possible to send AT commands. Use the escape sequence "+++" to return in command mode. GNSS data stream format:

<NMEA SENTENCE 1><CR><LF>
...
<NMEA SENTENCE N><CR><LF>
...

If the **<enable>** is 3, this **<enable>** option isn't stored in NVM.

AT$GPSNMUN?

Read command returns whether the unsolicited GNSS 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>

The storage of **$GPSNMUN** setting value is following,

Setting saved
Other

The current setting is stored through **$GPSSAV** command.

Not Subject to NDA

Set the GSA as available sentence in the unsolicited message
AT$GPSNMUN=1,0,0,1,0,0,0
OK

Turn-off the unsolicited mode
AT$GPSNMUN=0
OK

Read the current NMEA mask configuration:
AT$GPSNMUN?
$GPSNMUN: 1,0,0,1,0,0,0
OK

The unsolicited message will be:
$GPSNMUN: $GPGSA,A,3,23,20,24,07,13,04,02,,,,,,2.4,1.6,1.8*3C

Not Subject to NDA

3.28.4.2. AT$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration

This command permits to activate an unsolicited streaming of GNSS data.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GPSNMUNEX=<GNGNS>[,<GNGSA>[,<GLGSV>[,<GPGRS>[,<BDGSA>[,<BDGSV>[,<GAGSA>[,<GAGSV>[,<GPDTM>]]]]]]]]

Set command permits to activate an unsolicited streaming of GNSS data (in NMEA extended format) through the NMEA port and defines which NMEA extended sentences will be available.

Parameters:

Name	Type	Default	Description
<GNGNS>	integer	0	Fix data of GNSS receivers Values: 0 : disable 1 : enable
<GNGSA>	integer	0	DOP and active satellites of GNSS Values: 0 : disable 1 : enable
<GLGSV>	integer	0	GLONASS satellites in view Values: 0 : disable 1 : enable
<GPGRS>	integer	0	GPS Range Residuals

Not Subject to NDA

	Values: 0 : disable 1 : enable		
<BDGSA>	integer	0	Beidou DOP and Active Satellites Values: 0 : disable 1 : enable
<BDGSV>	integer	0	Beidou Satellites in View Values: 0 : disable 1 : enable
<GAGSA>	integer	0	Galileo DOP and Active Satellites Values: 0 : disable 1 : enable
<GAGSV>	integer	0	Galileo Satellites in View Values: 0 : disable 1 : enable
<GPDTM>	integer	0	Datum reference information Values: 0 : disable 1 : enable

Not Subject to NDA

NMEA extended data is displayed on NMEA port depending on **$GPSNMUN** <**enable**> parameter setting.

The storage of **$GPSNMUNEX** setting value is following,

Setting saved
Other

The current setting is stored through **$GPSSAV** command.

AT$GPSNMUNEX?

Read command returns the NMEA extended sentences availability status, in the format:

$GPSNMUNEX:
<GNGNS>,<GNGSA>,<GLGSV>,<GPGRS>,<BDGSA>,<BDGSV>,<GAGSA>,<GAGSV>,<GPDTM>

AT$GPSNMUNEX=?

Test command returns the supported range of values for parameters <GNGNS>,<GNGSA>,<GLGSV>,<GPGRS>,<BDGSA>,<BDGSV>,<GAGSA>,<GAGSV> and <GPDTM>.

Not Subject to NDA

- GNGNS sentence has field "mode indicator". The field is composed from the following order: gps, glonass, galileo and beidou.
- When gnss data is being received, there are four consecutive GNGSA sentences. The sentences are arranged at the following order: gps, glonass, galileo and beidou.
- All NMEA data stream is aligned with NMEA0183 v4.10.

  $BD--- NMEA data stream (for Beidou)

  $GA--- NMEA data stream (for Galileo)
- Galileo satellites are identified by their PRN numbers, ranging 1 to 36 (offset -300).
- Bediou satellites are identified by their PRN numbers, ranging 1 to 37 (offset -200).
- GNSS System ID (the last field of $--GSA) are identified as GPS: 1, GLONASS: 2, GALILEO: 3, BEIDOU: 4.

AT$GPSNMUN=1
OK

AT$GPSNMUNEX=1,0,0,0,0,0,0,0,0
OK

These sets the GNGNS as available sentence in the unsolicited NMEA sentences.

AT$GPSNMUNEX?
$GPSNMUNEX: 1,0,0,0,0,0,0,0,0
OK

Give the current frame selected (GNGNS)

The unsolicited message will be:
$GNGNS,080558.0,3731.306144,N,12655.784429,E,AN,09,1.0,68.0,18.0,,*5B

Not Subject to NDA

3.28.4.3. AT$NMEA - Enable NMEA Stream

This command configures to enable NMEA Stream.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$NMEA=<n>

This command enables/disables the NMEA 0183 standard stream inside the module.

Sets the ability to enable or disable the NMEA stream.

Allows NMEA 0183 Sentences:

$GPGGA, **$GPGSA**, **$GPGSV**, **$GPRMC** and **$GPVTG**

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	mode

Values:

0 : Disable the NMEA 0183 standard stream

1 : Enable the NMEA 0183 standard stream

AT$NMEA=?

Read command returns the current value of the <n> parameter, in the format:

$NMEA: <n>

Not Subject to NDA

This command is only applicable for **Sprint** version.

This setting has an effect on **$GPSNMUN** setting and follows the storing operation of **$GPSNMUN** setting.

```
AT$NMEA=?
$NMEA: 0

OK
AT$GPSNMUN?
$GPSNMUN: 0,0,0,0,0,0,0

OK
AT$NMEA=1
OK
AT$GPSNMUN?
$GPSNMUN: 2,1,0,1,1,1,1

OK
```


Not Subject to NDA

3.28.4.4. AT$GPSACP - Get Acquired GNSS Position

This command returns information about the last GPS position.

[1] NMEA 0183 Standard

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GPSACP

Execution command returns information about the last GNSS position in the format:

$GPSACP: <UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>, <date>,<nsat_gps>,<nsat_glonass>

Additional info:

Meanings of the parameters returned by the command.

Name	Type	Default	Description
<UTC>	string	-	UTC time (hhmmss.sss) referred to GGA sentence
<latitude>	string	-	latitude in the format ddmm.mmmm N/S (referred to GGA sentence) where: dd: 00..90, degrees mm.mmmm: 00.0000..59.9999, minutes

Not Subject to NDA

			N/S: North/South
<longitude>	string	-	longitude in the format dddmm.mmmm E/W (referred to GGA sentence) where: ddd: 000..180, degrees mm.mmmm: 00.0000..59.9999, minutes E/W: East/West
<hdop>	string	-	Horizontal Dilution of Precision (referred to GGA sentence)
<altitude>	string	-	altitude - mean-sea-level (geoid) in meters (referred to GGA sentence)
<fix>	integer	N/A	fix type Values: 0 : invalid fix 1 : invalid fix 2 : 2D fix 3 : 3D fix
<cog>	string	-	Course over Ground (degrees, True) (referred to VTG sentence) in the format ddd.mm where: ddd: 000..360, degrees mm: 00..59, minutes
<spkm>	string	-	speed over ground (Km/hr) (referred to VTG sentence)

Not Subject to NDA

<spkn>	string	-	speed over ground (knots) (referred to VTG sentence)
<date>	string	-	date of fix (referred to RMC sentence) in the format ddmmyy where: dd: 01..31, day mm: 01..12, month yy: 00..99, year 2000 to 2099
<nsat_gps>	integer	N/A	total number of satellites in use (referred to GGA sentence) Value: 0÷12 : total number of satellites in use
<nsat_glonass>	integer	N/A	total number of GLONASS satellites in use Value: 0÷12 : total number of GLONASS satellites in use

AT$GPSACP?

Read command has the same behavior as the Execution command.

AT$GPSACP=?

Test command returns the **OK** result code.

Not Subject to NDA

AT$GPSP?
$GPSP: 0

when module is down there no acquired position

AT$GPSACP
$GPSACP:
OK

AT$GPSP=1
OK

Until first fix is received the command will display initial GPS position

AT$GPSACP
$GPSACP: ,,,,,1,,,,,,

OK

Once fix has been received the command will display actual GPS position

AT$GPSACP
$GPSACP: 3206.4020N,03450.2678E,1.1,3.3,0,0.0,0.0,0.0,030613,06,03
OK

Not Subject to NDA

3.28.4.5. AT$GETLOCATION - Get Current Location

This command configures to get Current Location.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT$GETLOCATION

Execution command returns information about the last current location, in the format:

<date>,<time>,<latitude>,<longitude>,<elevation>,<HEPE>,<speed>,<bearing>,<nsat>

Additional info:

▶▶ information

Name	Type	Default	Description
<date>	string	-	date (MM/DD/YYYY) stamp
<time>	string	-	24 hour time (HH:MM:SS) stamp
<latitude>	integer	-	latitude in decimal degrees (+/-DD.dddddd) +/-: North / South max of 90.000000 degrees
<longitude>	integer	-	longitude in decimal degrees (+/-DDD.dddddd) +/-: East / West max of 180.000000 degrees

Not Subject to NDA

<elevation>	integer	-	elevation in meters (+/-nnnn) Above [+] or below [-] sea level with reference to the WGS 84 reference Ellipsoid
<HEPE>	integer	-	Horizontal Estimated Position Error in meters (nnnnnn)
<speed>	integer	-	speed in meters per second (nnn)
<bearing>	integer	-	bearing in decimal degrees (+DDD.dd)
<nsat>	integer	-	number of satellites used in location fix (nn)

This command is only applicable for **Sprint** version.

If the location position is not to be retrieved or the location services are turned off, **ERROR** will be returned.

</>

AT$GETLOCATION
09/24/2009,21:43:57,39.012345,-104.012345,+312,1234567,40,359.93,13

OK

Not Subject to NDA

3.28.4.6. AT#GTP - Get Location from GTP WWAN Service

This command gets the location from GTP (Global Terrestrial Positioning) WWAN service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#GTP

Execute command returns a position based cellular database from GTP (Global Terrestrial Positioning) WWAN service, in the following format:

#GTP: <latitude>,<longitude>,<altitude>,<accuracy>

Additional info:

▶▶ Response

Name	Type	Default	Description
<latitude>	integer	N/A	Latitude (specified in WGS84 datum). Value: -90÷90.0 : degrees; +/-: North / South
<longitude>	integer	N/A	Longitude (specified in WGS84 datum) Value: -180÷180.0 : degrees; +/-: East / West
<altitude>	integer	N/A	Altitude with respect to the WGS84 ellipsoid

Not Subject to NDA

Value:

-500÷15883 : meters

<accuracy>	string	-	Horizontal position uncertainty (circular); meters

AT#GTP?

Read command returns the same response as the Execution command.

AT#GTP=?

Test command returns the **OK** result code.

- If module gets a fix from **#GTP** command for 35 seconds, it returns **ERROR**.
- If the GTP (Global Terrestrial Positioning) WWAN service is enabled, the unintentional data usage can be occurred. Please set as disable if you want not to use this feature. (See **#GTPEN**)
- Define the PDP context via **+CGDCONT** command before using **#GTP** command.

Not Subject to NDA

```
AT+CPIN?
+CPIN: READY

OK
AT+CFUN?
+CFUN: 1

OK
AT+CREG?
+CREG: 0,1

OK
AT+CGDCONT=1,"IP","APN"
OK
AT#GTPEN=1
OK
AT#REBOOT
OK
AT#GTP
#GTP: 37.521744,126.929169,356.00,466.74
OK
```


Not Subject to NDA

3.29. PSM (Power Saving Mode)

3.29.1. AT+CPSMS - Power Saving Mode Setting

This command enables/disables Power Saving Mode (PSM) mode.

[1] 3GPP TS 27 007
[2] 3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT+CPSMS=[<mode>[,<ReqPeriodicRAU>[,<ReqGPRSreadyTimer>[,<ReqPeriodicTAU>[,<ReqActiveTime>]]]]]

The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disables or enables the use of PSM in the UE. Values: 0 : Disable 1 : Enable
<ReqPeriodicRAU>	string	-	one byte in an 8 bit format. Requested extended periodic RAU value (**T3312**)

Not Subject to NDA

			to be allocated to the UE in GERAN. The requested extended periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer3 IE in 3GPP TS 24.008 (Not Supported).
<ReqGPRSreadyTimer>	string	-	one byte in an 8 bit format. Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN. The requested GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008 (Not Supported).
<ReqPeriodicTAU>	string	-	one byte in an 8 bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and

Not Subject to NDA

			the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008.
<ReqActiveTime>	string	-	one byte in an 8 bit format. Requested Active Time value (**T3324**) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008.

- A special form of the command can be given as **AT+CPSMS=** (with all parameters omitted). In this form, the parameter **<mode>** will be set to 0, the use of PSM will be disabled and data for all parameters in command **+CPSMS** will be removed or, if available, set to the manufacturer specific default values.
- CPSMS configuration is saved in the file system
- The <Requested_Periodic-RAU> and <Requested_GPRS-READY-timer> parameters are not supported in this module. In other words, these parameters input values are ignored.

AT+CPSMS?

Read command returns the current CPSMS configuration, in the format:

+CPSMS:<mode>,[<ReqPeriodicRAU>],[<ReqGPRSreadyTimer>],[<ReqPeriodicTAU>], [<ReqActiveTime>]

Not Subject to NDA

AT+CPSMS=?

Test command reports the range for the parameters in the format:

+CPSMS:(list of supported <**mode**>s),(list of supported <**ReqPeriodicRAU**>s),(list of supported <**ReqGPRSreadyTimer**>s),(list of supported <**ReqPeriodicTAU**>s),(list of supported <**ReqActiveTime**>s)

How to manage timer values octet.

T3412ext value:

Bits 5 to 1 represent the binary coded timer value.
Bits 6 to 8 defines the timer value unit as follows:

Bits

8 7 6
0 0 0 value is incremented in multiples of 10 minutes
0 0 1 value is incremented in multiples of 1 hour
0 1 0 value is incremented in multiples of 10 hours
0 1 1 value is incremented in multiples of 2 seconds
1 0 0 value is incremented in multiples of 30 seconds
1 0 1 value is incremented in multiples of 1 minute
1 1 0 value is incremented in multiples of 320 hours
1 1 1 value indicates that the timer is deactivated.

Example: 10101100 -> 101 means values is incremented in multiples of 1 minute, 01100 means 12 -> the obtained value is 12 minutes

T3324 value:

Bits 5 to 1 represent the binary coded timer value.
Bits 6 to 8 defines the timer value unit for the GPRS timer as follows:
Bits
8 7 6
0 0 0 value is incremented in multiples of 2 seconds
0 0 1 value is incremented in multiples of 1 minute
0 1 0 value is incremented in multiples of decihours
1 1 1 value indicates that the timer is deactivated.

Not Subject to NDA

AT+CPSMS=1,,,"10101100","00100010"
OK

AT+CPSMS?
+CPSMS: 1,,,"10101100","00100010"
OK

It means that module requires to adopt the PSM for reducing its power consumption. If the network supports PSM and accepts that the UE uses PSM with requested timers value, module enters in PSM when the active timer expires (T3324=2 minutes) and stay in this mode for ten minutes (T3412=12 minutes).

AT+CPSMS=0
OK

It means that PSM is set to disable, the module does not go to Power Saving Mode in any case.

Not Subject to NDA

3.29.2. AT#PSMWDISACFG - Power Saving mode configuration

This command used to configure power saving mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#PSMWDISACFG=<mode>

Set command configures power saving mode.

Parameter:

Name	Type	Default	Description
<mode>	integer	2	Low Power Mode

Values:

1 : power saving mode by W_DISABLE_N pin

2 : ignore change on W_DISABLE_N pin

3 : low power mode by W_DISABLE_N pin

Additional info:

- When **<mode>** is set to 1 or 3, W_DISABLE_N(GPIO8) is set as input and sense it continuously.

  If W_DISABLE_N is asserted to low (means GPIO8 changed to high), modem is entered to PSM/LPM mode and USB VBUS is disconnected(GPIO10 goes to low).

Not Subject to NDA

- All configured values stored on module and applied after next power cycle.
However, LE910C1-EUX/SAX/SVX and LE910Cx-WWX can be applied immediately.

- The setting is not maintained after firmware update but maintained when firmware switching.

- When **<mode>** is 1 or 3, doesn't power off by ON_OFF_N.

- When **<mode>** is 1 or 3, GPIO8 and GPIO10 are used as W_DISABLE_N monitoring and VBUS control. Customer should not use GPIO for other function.

- This command works only with mPCIe type and may cause malfunction if set on other HW types such as LGA form factor.

AT#PSMWDISACFG?

Read command returns current mode.

AT#PSMWDISACFG=?

Test command reports the supported mode.

- AT#PSMWDISACFG=3
OK

- AT#PSMWDISACFG?
#PSMWDISACFG: 3

OK

Not Subject to NDA

3.29.3. AT#PSMCTS - Power Saving Mode CTS

Set command enables/disables the CTS pin response to an URC message while modem is in power saving mode.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#PSMCTS=<n>

Parameter:

Name	Type	Default	Description
<n>	integer	0	disables/enables CTS pin response to an URC message. When response is enabled, <n> sets also CTS pulse duration.
	Values:		
	0	:	disable CTS pin response
	50÷1150	:	enables CTS pin response and sets CTS pulse duration in ms

The feature set by #PSMCTS is activated only when modem is in sleep mode AT+CFUN=5.

AT#PSMCTS?

Read command reports the CTS pulse duration expressed in ms, in the format:

 # PSMCTS: <n>

AT#PSMCTS=?

Not Subject to NDA

Test command reports the supported values of parameter **<n>**.

Not Subject to NDA

3.30. IMS

3.30.1. AT#PDPIMSCFGE - edit PDP Profile Registry

Edit PDP Profile Registry

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	Auto	No	-	2

AT#PDPIMSCFGE=<cid>,<P-CSCF Address Flag>,<DHCP Flag>,<CN Flag>

This command is used to edit PDP profile registry.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identifier
<P-CSCF Address Flag>	integer	0	P-CSCF Address Flag
	Values: 0 : Preference of P-CSCF address discovery not influenced 1 : Preference of P-CSCF address discovery through NAS signalling		
<DHCP Flag>	integer	0	DHCP Flag
	Values: 0 : Preference of P-CSCF address discovery not using DHCP 1 : Preference of P-CSCF address discovery through DHCP		
<CN Flag>	integer	0	CN Flag

Not Subject to NDA

Values:

0 : PDP context is not for IM CN subsystem-related signalling only

1 : PDP context is for IM CN subsystem-related signalling only

AT#PDPIMSCFGE?

Read command returns the values in the following format:

#PDPIMSCFGE: <cid>,<P-CSCF Address Flag>,<DHCP Flag>,<CN Flag>

Ex)AT#PDPIMSCFGE?

#PDPIMSCFGE: 1 , 0 , 0 , 0

#PDPIMSCFGE: 2 , 1 , 0 , 1

#PDPIMSCFGE: 3 , 1 , 0 , 1

#PDPIMSCFGE: 4 , 0 , 0 , 0
OK

AT#PDPIMSCFGE=?

Test command returns the range of supported values for all the parameters.

AT#PDPIMSCFGE=?
#PDPIMSCFGE: (1-24,100-179),(0-1),(0-1),(0-1)

OK

Not Subject to NDA

3.30.2. AT+CIREG - IMS registration state

This command controls the presentation of an unsolicited result code.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Specific profile	No	-	2

AT+CIREG=[<mode>]

Set command controls the presentation of an unsolicited result code when there is a change in the MT's IMS registration information.

Unsolicited result code has the following format:

+CIREGU: <reg_info>[,<ext_info>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Enables or disables reporting of changes in the MT's IMS registration information. Values: 0 : disable reporting (default) 1 : enable reporting (parameter <reg_info>) 2 : enable extended reporting (parameters <reg_info> and <ext_info>)

Unsolicited fields:

Name	Type	Description
<reg_info>	integer	Indicates the IMS registration status. The UE is seen as registered as long as one or more of its

Not Subject to NDA

		public user identities are registered with any of its contact addresses, see 3GPP TS 24.229. Values: 0 : not registered. 1 : registered.
<ext_info>	hex	The value range is from 1 to FFFFFFFF. It is a sum of hexadecimal values, each representing a particular IMS capability of the MT. The MT can have IMS capabilites not covered by the below list. This parameter is not present if the IMS registration status is "not registered". Values: 1 : RTP-based transfer of voice according to MMTEL, see 3GPP TS 24.173. This functionality can not be indicated if the UE is not available for voice over PS, see 3GPP TS 24.229. 2 : RTP-based transfer of text according to MMTEL, see 3GPP TS 24.173. 4 : SMS using IMS functionality, see 3GPP TS 24.341. 8 : RTP-based transfer of video according to MMTEL, see 3GPP TS 24.173.

parameter **<mode>** is saved in profile.

AT+CIREG?

Read command reports the current state of IMS registration in the format:

Not Subject to NDA

+CIREG: <mode>,<reg_info>[,<ext_info>]

AT+CIREG=?

Test command returns the supported range of values for parameter <mode>.

Not Subject to NDA

3.31. File System

3.31.1. AT#WSCRIPT - Write File

Write user file into File system

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#WSCRIPT=[<script_name>[,<size>[,<hidden>]]]

Set command store a file in user NVM , naming it **<script_name>**

The device shall prompt five characters 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 complete when all the bytes are received.

If writing ends successfully, the response is OK; otherwise an error code is reported.

Parameters:

Name	Type	Default	Description
<script_name>	string	-	name of the file in NVM, string type (max 127chars, case sensitive)
<size>	integer	-	file size in bytes
<hidden>	integer Values:	0	file hidden attribute

Not Subject to NDA

0 : file content is readable with #RSCRIPT

1 : file content is hidden, #RSCRIPT command will report empty

In case of this command on UART, DTE must use HW flow control and AT+IFC=2,2 configured.

when sending the script be sure that the line terminator is <CR><LF> and that your terminal program does not change it.

with the hidden attribute it is possible to protect your files from being viewed and copied, only the file name can be viewed, its content is hidden even if the file is still being run correctly.
It's your care to maintain knowledge on what the file contains.

AT#WSCRIPT=?

Test command returns OK result code.

AT#WSCRIPT="userdata.txt ",54,0

>>> here receives the prompt; then type or send the textual data, sized 54 bytes OK Textual data has been stored

OK

Not Subject to NDA

3.31.2. AT#RSCRIPT - Read File

Read user file from file system

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#RSCRIPT=[<script_name>]

Set command reports the content of file **<script_name>** in user NVM.

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.

Parameter:

Name	Type	Default	Description
<script_name>	string	-	file name, string type (max 127 chars, case sensitive).

In case of this command on UART, DTE must use HW flow control and AT+IFC=2,2 configured.

If the file was saved with the hidden attribute, then an empty file is reported with the OK result code.

If the file is not present an error code is reported.

AT#RSCRIPT=?

Test command returns OK result code.

Not Subject to NDA

AT#RSCRIPT="userdata.txt "

hereafter receive the prompt; then the script is displayed, immediately after the prompt

<<<userdata: 12345678

OK

Not Subject to NDA

3.31.3. AT#LSCRIPT - List File Names

List Script Names

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#LSCRIPT

Execution command reports the list of file names currently stored in user NVM and the available free 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 127 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.

AT#LSCRIPT

#LSCRIPT: “userdata.txt”,51

#LSCRIPT: “data.txt”,178

#LSCRIPT: “mydata1.txt”,95

#LSCRIPT: free bytes: 20000

OK

Not Subject to NDA

3.31.4. AT#DSCRIPT - Delete File

Delete Script

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#DSCRIPT=[<script_name>]

Execution command deletes a file from user NVM.

Parameter:

Name	Type	Default	Description
<script_name>	string	-	name of the file to delete, string type (max 127 chars, case sensitive)

NOTE: if the file **<script_name>** is not present an error code is reported.

```
AT#DSCRIPT="userdata.txt"
OK
```


Not Subject to NDA

3.32. MQTT

3.32.1. AT#MQEN - Enable MQTT Feature

This command initializes a MQTT client and allocates the necessary resources.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQEN=<instance_number>,<enable>

Set command enables/disables the MQTT client for further configuration and usage

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance to activate or deactivate. Value: 1÷maxClients : client instance range. to know maxClients value use test command
<enable>	integer	0	Selects if client must be activated or deactivated Values: 0 : disable 1 : enable

AT#MQEN?

Not Subject to NDA

Read command returns the status of the MQTT stack in the format

#MQEN: <instance_number>,<enable>

AT#MQEN=?

Test command reports the available range of values for parameters

#MQEN: (1-maxClients),(0-1)

Set command
AT#MQEN=1,1
OK

Read command
AT#MQEN?
#MQEN: 1,1
#MQEN: 2,0

OK

Test command
AT#MQEN=?
#MQEN: (1-2),(0-1)

OK

Not Subject to NDA

3.32.2. AT#MQSUB - Subscribe to a MQTT Topic

This command performs the subscription to a MQTT topic.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQSUB=<instance_number>,<topic>[,<qos>]

Set command performs the subscription to a MQTT topic

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance Value: 1÷maxClients : client instance range. to know maxClients value use test command
<topic>	string	-	Name of the Topic
<qos>	integer	1	QoS (LE910Cx Linux exclusive) Value: 0÷2 : QoS

AT#MQSUB?

Read command to show last "message id" and "subscribe reason code" on MQTT V5.

LE910Cx Linux exclusive.

Not Subject to NDA

AT#MQSUB=?

Test command reports the available range of values for parameters

#MQSUB: (1-maxClients),

Set command
AT#MQSUB=1,"TOPIC"
OK

Test command
AT#MQSUB=?
#MQSUB: (1-2),

OK

Not Subject to NDA

3.32.3. AT#MQUNS - Unsubscribe from a Topic

This command revokes the subscription to a MQTT topic.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQUNS=<instance_number>,<topic>

Set command revokes the unsubscription from a MQTT topic

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance
	Value:		
	1÷maxClients :		client instance range. to know maxClients value use test command
<topic>	string	-	Name of the Topic

AT#MQUNS=?

Test commands reports the available range of values for parameters.

#MQUNS: (1-maxClients),

Not Subject to NDA

Set command
AT#MQUNS=1,"TOPIC"
OK

Test command
AT#MQUNS=?
#MQUNS: (1-2),

OK

Not Subject to NDA

3.32.4. AT#MQPUBS - Publish ASCII String

This command publishes an ASCII string to the specified MQTT topic.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQPUBS=<instance_number>,<topic>[,<retain>[,<qos>[,<message>]]]

Set command publishes publishes a string to the specified MQTT topic

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance Value: 1÷maxClients : client instance range. to know maxClients value use test command
<topic>	string	-	Name of the Topic
<retain>	integer	0	Specifies if the broker must retain this message or not Values: 0 : broker must not retain this message 1 : broker must retain this message
<qos>	integer	1	Specifies the Quality of Service of this message Value: 0÷2 : Quality of Service range

Not Subject to NDA

<message>	string	-	Message to publish on the topic. Maximum length of message depends on protocol specification and system memory available.

The maximum command line buffer size for LE910Cx Linux is 560 bytes, which means only the input bytes (i.e. from "AT" to the last given parameter) less or equal to 560 bytes will be accepted.

AT#MQPUBS=?

Test command reports the available range of values for parameters

#MQPUBS: (1-maxClients),,(0-1),(0-2),,

Set command
AT#MQPUBS=1,"TOPIC"
OK

AT#MQPUBS=1,"TOPIC",1
OK

AT#MQPUBS=1,"TOPIC",1,2
OK

AT#MQPUBS=1,"TOPIC",1,2,"MESSAGE"
OK

Test command
AT#MQPUBS=?
#MQPUBS: (1-2),,(0-1),(0-2),

OK

Not Subject to NDA

3.32.5. AT#MQCFG - Configure MQTT Parameters

This command sets the connection parameters for the selected MQTT client

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQCFG=<instance_number>,<host_name>,<port>,<cid>[,<ssl_en>]

Set command sets the connection parameters for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command. Value: 1÷maxClients : client instance range. To know maxClients value use test command
<host_name>	string	-	URL of the MQTT broker
<port>	integer	N/A	TCP port of the MQTT broker Value: 1÷65535 : TCP port range
<cid>	integer	N/A	PDP Context ID to be used for the connection Value: 1÷maxCid : <cid> Range

Not Subject to NDA

<ssl_en>	integer	0	Enable/Disable SSL Values: 0 : disable 1 : enable

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.

AT#MQCFG?

Read command returns the status of the MQTT stack in the format

#MQCFG: <instance_number>,<host_name>,<port>,<cid>[,<ssl_en>]

AT#MQCFG=?

Test command reports the available range of values for parameters

#MQCFG: (1,maxClients),,(1-65535),(1-maxCid),(0-1)

Not Subject to NDA

65. SSL disabled (by default)

Set command
AT#MQCFG=1,api.mybroker.com,1883,3
OK

Read command
AT#MQCFG?
#MQCFG: 1,api.mybroker.com,1883,3,0
#MQCFG: 2,,1883,1

OK

Test command
AT#MQCFG=?
#MQCFG: (1-maxClients),,(1-65535),(1-maxCid),(0-1)

OK

66. SSL enabled

Set command
AT#MQCFG=1,api.mybroker.com,8883,3,1
OK

Read command
AT#MQCFG?
#MQCFG: 1,api.mybroker.com,8883,3,1
#MQCFG: 2,,1883,1,0

OK

Test command
AT#MQCFG=?
#MQCFG: (1-maxClients),,(1-65535),(1-maxCid),(0-1)

OK

Not Subject to NDA

3.32.6. AT#MQCFG2 - Configure Additional MQTT Parameters

This command sets the optional connection parameters for the selected MQTT client.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQCFG2=<instance_number>,<keepalive>,<clean_session>

Set command sets optional connection parameters for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command. Value: 1÷maxClients : client instance range. to know maxClients value use test command.
<keepalive>	integer	N/A	Timeout of periodic packet to keep connection open Value: 1÷3600 : timeout expressed in sec
<clean_session>	integer	N/A	Indicates whether a persistent connection is required. Without a persistent connection, when the client is offline all information and messages that are queued from a previous persistent session are lost.

Not Subject to NDA

Values:

0 : persistent session

1 : clean session

AT#MQCFG2?

Read command returns the configuration of all active MQTT clients in the format

#MQCFG2: <instance_number>,<keepalive>,<clean_session>

AT#MQCFG2=?

Test command reports the available range of values for parameters

#MQCFG2: (1-maxClients),(1-3600),(0-1)

Set command
AT#MQCFG2=1,20,1
OK

Read command
AT#MQCFG2?
#MQCFG2: 1,20,1
#MQCFG2: 2,30,1

OK

Test command
AT#MQCFG2=?
#MQCFG2: (1-2),(1-3600),(0-1)

OK

Not Subject to NDA

3.32.7. AT#MQWCFG - Configure MQTT Last Will and Testament

This command sets Last Will and Testament for the selected MQTT client

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQWCFG=<instance_number>,<will_flag>[,<will_retain>[,<will_qos>[,<will_topic>[,<wii_msg>]]]]

Set command sets Last Will and Testament for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command. Value: 1÷maxClients : client instance range. to know maxClients value use test command.
<will_flag>	integer	0	Selects whether the client needs to specify a Last Will and Testament. If set to 0, this is the last parameter to be set. Values: 0 : the client does not need to specify a Last Will and Testament 1 : the client needs to specify a Last Will and Testament
<will_retain>	integer	0	Selects whether the Last Will message needs to be retained

Not Subject to NDA

			by the server. Without a persistent connection, when the client is offline all information and messages that are queued from a previous persistent session are lost. Values: 0 : the Last Will message does not need to be retained by the server 1 : the Last Will message needs to be retained by the server
<will_qos>	integer	N/A	Quality of Service of the Last Will message Value: 0÷2 : Quality of Service range
<will_topic>	string	-	Topic to publish the Last Will message to
<wii_msg>	string	-	Last Will message

AT#MQWCFG?

Read command returns the Last Will and Testament (if any) of all active MQTT clients in the format

#MQWCFG: <instance_number>,<will_flag>[,<will_retain>,<will_qos>,<will_topic>,<will_message>]

AT#MQWCFG=?

Test command reports the available range of values for parameters

#MQWCFG: (1-maxClients),(0-1),(0-1),(0-2),,,

Not Subject to NDA

Set command
AT#MQWCFG=1,0
OK

AT#MQWCFG=1,1,1,2,myLastWillTopic,myLastWillMessage
OK

Read command
AT#MQWCFG?
#MQWCFG: 1,0
#MQWCFG: 2,1,0,2,myTopic,myMessage

OK

Test command
AT#MQWCFG=?
#MQWCFG: (1-2),(0-1),(0-1),(0-2),,,

OK

Not Subject to NDA

3.32.8. AT#MQTCFG - Configure Timeout Parameters for MQTT Transmission

This command sets the timeout options for the specified client.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQTCFG=<instance_number>,<packet_timeout>

Set command writes the timeout options for the specified client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command. Value: 1÷maxClients : client instance range. to know maxClients value use test command.
<packet_timeout>	integer	N/A	Timeout of the packet delivery. Value: 1÷60 : timeout range. value expressed in seconds.

AT#MQTCFG?

Read command returns the timeout configuration of all active MQTT clients in the format

#MQTCFG: <iinstance_number>,<packet_timeout>

Not Subject to NDA

AT#MQTCFG=?

Test command reports the available range of values for parameters

#MQTCFG: (1-maxClients),(1-60)

Set command
AT#MQTCFG=1,10
OK

Read command
AT#MQTCFG?
#MQTCFG: 1,5
#MQTCFG: 1,4

OK

Test command
AT#MQTCFG=?
#MQTCFG: (1-2),(1-60)

OK

Not Subject to NDA

3.32.9. AT#MQSCFG - Configure MQTT SSL certs and key

Configure MQTT SSL certs and key

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQSCFG=<instance_number>,<cert_type>,<set>[,<size>]

Set command to set SSL certs

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN**? or the read command. Value: 1÷maxClient : client instance range. To know maxClients value use test command
<cert_type>	integer	N/A	Select cert type Values: 0 : CA cert 1 : Client cert 2 : Client key
<set>	integer	N/A	Unset/set selected <cert_type> Values: 0 : Unset selected <cert_type>

Not Subject to NDA

1 : Set selected <cert_type>			
<size>	integer	-	Number of bytes to write to the file.

- This command only support Linux based model. Please refer availability table.
- Supported file types are PEM and DER.
- If you try to set <cert_type> (ex:AT#MQSCFG=1,0,1), prompt will appear, then you can send your certs files. You can use ctrl+z to notify end of operation.
- It is also possible to set <cert_type> with size (ex:AT#MQSCFG=1,0,1,1234), after prompt appeared, you can send your certs files. As soon Size byte are written, data are sent and OK is returned.
- Please try to use #MQSCFG rather than #SSLSECDATA to avoid unexpected issues. #SSLSECCFG is shared by many applications.
- #MQSCFG has higher priority than #SSLSECDATA which means that in case you set ssl certs files by not only #MQSCFG but also #SSLSECDATA, certs files from #MQSCFG is preferred.

AT#MQSCFG?

Read command reports ssl certs setting status.

#MQSCFG=<instance_number>,<CA_cert_set>,<client_cert_set>,<client_key_set>

AT#MQSCFG=?

Test command reports the available range of values for parameters

#MQCONN: (1-maxClients),(0-2)(0,1)

Not Subject to NDA

Set command

AT#MQSCFG=1,0,0
OK

AT#MQSCFG=1,0,1
> YOUR_CERT_FILE

PRESS_CTRL_Z

OK

AT#MQSCFG=1,0,1,1234
> *...write here the binary data. As soon Size byte are written, data are sent and OK is returned*

OK

Not Subject to NDA

3.32.10. AT#MQCONN - Connect and Log in the MQTT Broker

This command performs the connection and login to the MQTT broker.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQCONN=<instance_number>,<client_id>[,<user_name>,<password>]

Set command perform network connection (using parameters set with **#MQCFG**) and sends the CONNECT packet to the MQTT broker

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command Value: 1÷maxClients : client instance range. to know maxClients value use test command.
<client_id>	string	-	Identifies each MQTT client that connects to the MQTT broker
<user_name>	string	-	Authentication and authorization: This is not mandatory, but this value must be pair with <password> ex) AT#MQCONN=1,"Test","USER" (Invalid) AT#MQCONN=1,"Test","USER","PASS" (valid)
<password>	string	-	Authentication and authorization

Not Subject to NDA

If connection status is other than init state or connected, disconnect using **#MQDISC** before reconnecting using **#MQCONN**.

For LE910Cx Linux models, URC is generated and flushed if the client disconnected abnormally from the broker with following format:

#MQCONN: <instance_number>,DISCONNECT

AT#MQCONN?

Read command reports the configuration of active MQTT connections in the format:

#MQCONN=<instanceNumber>,<state>

The following tables shows the **<state>** values and meanings:

LE910Cx Linux :

Client status

Normal operations values:
0: client is in init state
1: client is connecting to server
2: client is connected

Failure events values:
-1: connection reset by peer
-2: PINGREQ timeout failed
-3: CONNECT packet was not delivered
-4: CONNACK packet was not received
-5: Network error, such as socket timeout
-6: Fatal error in internal library. Deinit client and open it again with **AT#MQEN**

LE910Cx ThreadX :

Normal / Failure events values:
0: client is initialized but not connected
1: client performed MQTT authentication with broker
2: connection closed or reset by the server
3: the answer to the ping request packet was not received
4: the CONNACK packet was not received
5: the CONNECT packet was not delivered

Not Subject to NDA

6: failure in the m2mb APIs
7: socket timeout or read error

For LE910Cx Linux model, if the MQTT version of the corresponding <instance_number> is set to v5.0, please refer to MQTT version 5.0 for more failure events values.

AT#MQCONN=?

Test command reports the available range of values for parameters

#MQCONN: (1-maxClients),,,

Not Subject to NDA

Set command
AT#MQCONN=1,"TEST_SERVER_WITHOUT_AUTH"
OK

AT#MQCONN=1,"TEST_SERVER_WITH_AUTH","USER","PW"
OK

Scenario (1)

Read command
AT#MQCONN?
#MQCONN: 1,1
#MQCONN: 2,0

OK

Test command
AT#MQCONN=?
#MQCONN: (1-2),,,

OK

Scenario (2)

Read command
AT#MQCONN?
#MQCONN: 1,2

OK

Set command
AT#MQDISC=1

OK

Read command
AT#MQCONN?
#MQCONN: 1,0

OK

Not Subject to NDA

3.32.11. AT#MQDISC - Log Out and Disconnect from the MQTT Broker

This command performs the logout and disconnection from to the MQTT broker.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQDISC=<instance_number>[,<disc_reason>]

Disconnects gracefully from the MQTT broker, then closes the network connection

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance Value: 1,2 : client instance range. to know maxClients value use test command
<disc_reason>	integer	N/A	Disconnection reason code (LE910Cx LInux exclusive) Value: 0÷154 : Disconnect reason code

<disc_reason> only valid if the MQTT version of the corresponding <instance_number> is set to v5.0. Omit the **<disc_reason>** parameter meant the normal disconnection. Please refer to MQTT version 5.0 for disconnection reason code.

Not Subject to NDA

AT#MQDISC=?

Test command reports the available range of values for parameters

#MQDISC: (1-maxClients)

Set command
AT#MQDISC=1
OK

Test command
AT#MQDISC=?
#MQDISC: (1-2)

OK

Not Subject to NDA

3.32.12. AT#MQREAD - Read Messages Received from the MQTT Broker

This command reads the message payload from the queue slot provided.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	-	2

AT#MQREAD=<instance_number>,<message_id>

After command line is terminated with <CR>, the module responds sending:
#MQREAD: <instanceNumber>,<topic>,<payload_len>,

then the module prompts the following characters sequence:
<less_than><less_than><less_than><carriage return><line feed> (IRA 60, 60, 60, 13, 10)

followed by the data

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance to activate or deactivate Value: 1÷maxClients : client instance range. to know maxClients value use test command
<message_id>	integer	N/A	Message slot Id to be read. The read operation will free the slot resource. Value: 1÷30 : message slot Id range

Additional info:

Not Subject to NDA

UNCOLICITED MESSAGE:

#MQRING - Received data on subscribed topic

When a message is received on the subscribed topic, an URC message is sent to all AT commands interfaces. There are 30 messages slots available for incoming messages, and it is responsibility of the user to keep them empty by reading them with **#MQREAD**.

67. If the message queue is full, and a new message arrives, the following URC **#MQRING: 0** is received.
68. Otherwise, for normal messages, the URC format is:
#MQRING: <instance_number>,<message_id>,<topic>,<len>

In the Unsolicited fields section are described the URC message parameters not described in the previous sections.

Name	Type	Default	Description
<topic>	string	-	name of the topic from where the message was received
<len>	integer	-	length in bytes of the received payload

AT#MQREAD?

Read command returns the unread messages count for each instance number for all active MQTT clients in the format

#MQREAD: <instanceNumber>,<unread>

AT#MQREAD=?

Test command reports the available range of values for parameters

#MQREAD: (1-maxClients),(1-30)

Not Subject to NDA

Set command
AT#MQREAD=1,2
#MQREAD: 1, "toipc",10
<<<
0123456789

OK

Read command
AT#MQREAD?
#MQREAD: 1, 1
#MQREAD: 2, 10

OK

Test command
AT#MQREAD=?
#MQREAD: (1-2),(1-30)

OK

Not Subject to NDA

3.32.13. AT#MQVCFG - Configure MQTT version

Configure MQTT version

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQVCFG=<instance_number>,<version>

Set command sets the MQTT version for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	N/A	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command. Value: 1÷maxClients : client instance range. to know maxClients value use test command.
<version>	integer	4	MQTT version Values: 4 : MQTT version 3.1.1 5 : MQTT version 5.0

AT#MQVCFG?

Read command reports the currently selected parameters in the format:

#MQVCFG: <instance_number>,<version>

Not Subject to NDA

AT#MQVCFG=?

Test command reports the supported range of values for parameters
#MQVCFG: (1-maxClient),(4,5)

Set command

AT#MQVFG=1,4
OK

Read command

AT#MQVCFG?

#MQVCFG: 1,4

#MQVCFG: 2,4

OK

Test command

AT#MQVCFG =?

#MQVCFG: (1-2),(4,5)

OK

Not Subject to NDA

3.32.14. AT#MQCOPP - Set CONNECT Packet Property for MQTT Transmission

Set CONNECT Packet Property for MQTT Transmission

MQTT Version 5.0

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQCOPP=<instance_number>,<identifier>,<value>[,<user_property_name>[,<user_property_value>]]

Set command sets the CONNECT packet property for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	-	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command.
<identifier>	integer	N/A	Property identifier. Values: 17 : 0x11, Session Expiry Interval. <value> mapping to this identifier should be an integer 23 : 0x17, Request Problem Information. <value> mapping to this identifier should be an integer 25 : 0x19, Request Response Information. <value> mapping to this identifier should be an integer

Not Subject to NDA

33 : 0x21, Receive Maximum. <value> mapping to this identifier should be an integer

34 : 0x22, Topic Alias Maximum. <value> mapping to this identifier should be an integer

38 : 0x26, User Property. <value> mapping to this identifier stands for the user property index, which can be only set to 1 currently

<value>	integer	-	Value of the property identifier
<user_property_name>	string	-	User property name, string type. Valid and mandatory if the **<identifier>** set to 38
<user_property_value>	string	-	User property value, string type. Valid and mandatory if the **<identifier>** set to 38

This command only valid if the MQTT version of the corresponding <instance_number> is set to v5.0

AT#MQCOPP?

Read command reports the currently selected parameters in the format:

#MQCOPP: <instance_number>,<identifier>,<value>

<instance_number>,<identifier>,<value>

...

<instance_number>,<identifier>,<value>

AT#MQCOPP=?

Not Subject to NDA

Test command reports the supported range of values for parameters **#MQCOPP: (1-max_instance),(17,23,25,33,34,38),,,**

Set command

AT#MQCOPP=1,17,5
OK

Read command

AT#MQCOPP?

#MQCOPP: 1,17,5

#MQCOPP: 1,23,-1

#MQCOPP: 1,25,-1

#MQCOPP: 1,33,-1

#MQCOPP: 1,34,-1

#MQCOPP: 1,38,1,,

OK

Test command

AT#MQCOPP=?
#MQDIPP: (1-2),(17,28,31,38),,,

OK

Not Subject to NDA

3.32.15. AT#MQSUPP - Set SUBSCRIBE Packet Property for MQTT Transmission

Set SUBSCRIBE Packet Property for MQTT Transmission

MQTT Version 5.0

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQSUPP=<instance_number>,<identifier>,<value>[,<user_property_name>[,<user_property_value>]]

Set command sets the SUBSCRIBE packet property for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	-	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command.
<identifier>	integer	N/A	Property identifier Values: 11 : 0x0B, Subscription Identifier. <value> mapping to this identifier should be an integer 38 : 0x26, User Property. <value> mapping to this identifier stands for the user property index, which can be only set to 1 currently
<value>	mixed	-	Value of the property identifier

Not Subject to NDA

<user_property_name>	string	-	User property name, string type. Valid and mandatory if the **<identifier>** set to 38
<user_property_value>	string	-	User property value, string type. Valid and mandatory if the **<identifier>** set to 38

This command only valid if the MQTT version of the corresponding <instance_number> is set to v5.0

AT#MQSUPP?

Read command reports the currently selected parameters in the format:

#MQSUPP: <instance_number>,<identifier>,<value>

<instance_number>,<identifier>,<value>

...

<instance_number>,<identifier>,<value>

AT#MQSUPP=?

Test command reports the supported range of values for parameters

#MQSUPP: (1-max_instance),(11,38),,,

Set command

AT#MQSUPP=1,11,1
OK

Test command

AT#MQSUPP=?
#MQSUPP: (1-2),(11,38),,,

OK

Not Subject to NDA

Not Subject to NDA

3.32.16. AT#MQPUPP - Set PUBLISH Packet Property for MQTT Transmission

Set PUBLISH Packet Property for MQTT Transmission

MQTT Version 5.0

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQPUPP=<instance_number>,<identifier>,<value>[,<user_property_name>[,<user_property_value>]]

Set command sets the PUBLISH packet property for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	-	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command.
<identifier>	integer	N/A	Property identifier. Values: 1 : 0x01, Payload Format Indicator. <value> mapping to this identifier should be an integer 2 : 0x02, Message Expiry Interval. <value> mapping to this identifier should be an integer 3 : 0x03, Content Type. <value> mapping to this identifier should be a string

Not Subject to NDA

8 : 0x08, Response Topic. <value> mapping to this identifier should be a string

11 : 0x0B, Subscription Identifier. <value> mapping to this identifier should be an integer

35 : 0x23, Topic Alias. <value> mapping to this identifier should be an integer

38 : 0x26, User Property. <value> mapping to this identifier stands for the user property index, which can be only set to 1 currently

<value>	integer	-	Value of the property identifier
<user_property_name>	string	-	User property name, string type. Valid and mandatory if the **<identifier>** set to 38
<user_property_value>	string	-	User property value, string type. Valid and mandatory if the **<identifier>** set to 38

This command only valid if the MQTT version of the corresponding <instance_number> is set to v5.0

AT#MQPUPP?

Read command reports the currently selected parameters in the format:

#MQPUPP: <instance_number>,<identifier>,<value>

<instance_number>,<identifier>,<value>

...

<instance_number>,<identifier>,<value>

Not Subject to NDA

AT#MQPUPP=?

Test command reports the supported range of values for parameters

#MQPUPP: (1-max_instance),(1,2,3,8,11,35,38),,,

Set command

AT#MQPUPP=1,1,1
OK

Test command

AT#MQPUPP=?
#MQPUPP: (1-2),(1,2,3,8,11,35,38),,,

OK

Not Subject to NDA

3.32.17. AT#MQWIPP - Set WILL Property for MQTT Transmission

Set WILL Property for MQTT Transmission

MQTT Version 5.0

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQWIPP=<instance_number>,<identifier>,<value>[,<user_property_name>[,<user_property_value>]]

Set command sets the WILL property for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	-	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command.
<identifier>	integer	N/A	Property identifier. Values: 1 : 0x01, Payload Format Indicator. <value> mapping to this identifier should be an integer 2 : 0x02, Message Expiry Interval. <value> mapping to this identifier should be an integer 3 : 0x03, Content Type. <value> mapping to this identifier should be a string

Not Subject to NDA

8 : Response Topic. <value> mapping to this identifier should be a string

24 : 0x18, Will Delay Interval. <value> mapping to this identifier should be an integer

38 : 0x26, User Property. <value> mapping to this identifier stands for the user property index, which can be only set to 1 currently

<value>	integer	-	Value of the property identifier
<user_property_name>	string	-	User property name, string type. Valid and mandatory if the **<identifier>** set to 38
<user_property_value>	string	-	User property value, string type. Valid and mandatory if the **<identifier>** set to 38

This command only valid if the MQTT version of the corresponding <instance_number> is set to v5.0

AT#MQWIPP?

Read command reports the currently selected parameters in the format:

#MQWIPP: <instance_number>,<identifier>,<value>

<instance_number>,<identifier>,<value>

...

<instance_number>,<identifier>,<value>

AT#MQWIPP=?

Not Subject to NDA

Test command reports the supported range of values for parameters **#MQWIPP: (1-max_instance),(1,2,3,8,24,38),,,**

Set command

AT#MQWIPP=1,24,15
OK

Test command

AT#MQDIPP=?
#MQDIPP: (1-2),(1,2,3,8,24,38),,,

OK

Not Subject to NDA

3.32.18. AT#MQDIPP - Set DISCONNECT Packet Property for MQTT Transmission

Set DISCONNECT Packet Property for MQTT Transmission

MQTT Version 5.0

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#MQDIPP=<instance_number>,<identifier>,<value>[,<user_property_name>,<user_property_value>]

Set command sets the DISCONNECT packet property for the selected MQTT client

Parameters:

Name	Type	Default	Description
<instance_number>	integer	-	Selects the client instance. The list of available clients is obtained with **AT#MQEN?** or the read command.
<identifier>	integer	N/A	Property identifier Values: 17 : 0x11, Session Expiry Interval. <value> mapping to this identifier should be an integer 28 : 0x1C, Server Reference. <value> mapping to this identifier should be a string 31 : 0x1F, Reason String. <value> mapping to this identifier should be a string

Not Subject to NDA

		38 :	0x26, User Property. <value> mapping to this identifier stands for the user property index, which can be only set to 1 currently
<value>	mixed	-	Value of the property identifier
<user_property_name>	string	-	User property name, string type. Valid and mandatory if the **<identifier>** set to 38
<user_property_value>	string	-	User property value, string type. Valid and mandatory if the **<identifier>** set to 38

This command only valid if the MQTT version of the corresponding <instance_number> is set to v5.0

AT#MQDIPP?

Read command reports the currently selected parameters in the format:

#MQDIPP: <instance_number>,<identifier>,<value>

<instance_number>,<identifier>,<value>

...

<instance_number>,<identifier>,<value>

AT#MQDIPP=?

Test command reports the supported range of values for parameters

#MQDIPP: (1-max_instance),(17,28,31,38),,

Not Subject to NDA

Set command

AT#MQDIPP=1,17,5
OK

Test command

AT#MQDIPP=?
#MQDIPP: (1-2),(17,28,31,38),,

OK

Not Subject to NDA

3.33. Customization Feature AT Commands

3.33.1. AT#AVAHIEN - Enable/disable AVAHI service

This command is to enable/disable AVAHI service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#AVAHIEN=<Enable/Disable >

Set command enables/disables the AVAHI service.

Parameter:

Name	Type	Default	Description

AT#AVAHIEN?

Read command reports the currently selected parameters in the format:

#AVAHIEN=<enable>

AT#AVAHIEN=?

Test command reports the supported range of values for parameters

#AVAHIEN: (0-1)

Not Subject to NDA

3.33.2. AT#APPRUN - Application Run

This command manages to run and stop built-in applications

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	5 s	2

AT#APPRUN=<action>,<app name>[,<start param>]

Set command allows to run and stop with the specific parameter.

Parameters:

Name	Type	Default	Description
<action>	integer	N/A	specify the action to execute Values: 0 : stop application 1 : start application
<app name>	string	N/A	application name to start or stop Value: 1÷127 : application name string range
<start param>	string	N/A	start parameter. this value is available only if action is 1 (start) Value: 1÷255 : start parameter string range

AT#APPRUN?

Not Subject to NDA

Read command show the status of all built-in applications in the following format

AT#APPRUN?

#APPRUN: <application name>,<status>

#APPRUN: <application name>,<status>

...

OK

<status>

0 - application is not running

1 - application is running

AT#APPRUN=?

Test command returns the allowed value ranges in the following format

AT#APPRUN=?

#APPRUN: <action range>,<app name max length>,<app start parameter>

Not Subject to NDA

** Query available built-in application list and status

AT#APPRUN?

#APPRUN: captive_portal_telit,0

** Start "captive_portal_telit"

AT#APPRUN=1,"captive_portal_telit"

OK

** Check if "captive_portal_telit" application is running

AT#APPRUN?

#APPRUN: captive_portal_telit,1

OK

Not Subject to NDA

3.34. Dying GASP AT Commands

3.34.1. AT#DGEN - Dying GASP Configuration

This command sets the Dying GASP configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#DGEN=<mode>[,<GPIO>,<trigger>,<action>,<URC>][,<text>,<text_format>,[<SMSNum>][,<profile_id>,<IP_protocol>,<IP_addr:PORT>]]

Set command sets the Dying GASP configuration.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	reporting the result in the format: **#DGSTAT: <TimeStamp>,<SMSAttemptedFlag>** **Where:** **<TimeStamp>**: when <**action**> is set to 1 or 3, the timestamp of the last time when power loss was detected and Dying Gasp feature was triggered. - UTC time in seconds since Jan 06, 1980 (GPS Epoch). **<SMSAttemptedFlag>** : Indicates whether device attempted to send SMS in the last power loss event. 0 - SMS not attempted 1 - SMS attempted Note: This only indicates device sent the SMS does not guarantee network delivery.

Not Subject to NDA

Values:

0 : disable dying gasp.

1 : set the command parameters.

2 : read dying gasp statistics.

<GPIO>	integer	-	GPIO pin number; supported range is from 1 to a value that depends on the hardware. (see "Hardware User's Guide")
<trigger>	integer	0	GPIO trigger used for event Values: 0 : activate dying gasp when GPIO translates from high to low 1 : activate dying gasp when GPIO translates from low to high
<action>	integer	N/A	Dying GASP Action Values: 0 : disable both SMS and IP (TCP or UDP) connection 1 : Send SMS 2 : use IP (TCP or UDP) connection 3 : use SMS and IP (TCP or UDP) connection
<URC>	integer	N/A	URC presentation mode. The unsolicited message is in the format: **#DGEN: <GPIO value>,<text>** If parameter **<action>** is '0' (disabled): **#DGEN: <GPIO value>** Values:

Not Subject to NDA

0 : It disables the presentation of the notification URC.

1 : It enables the presentation of the notification URC when GPIO interrupt is triggered.

<text>	string	-	The format of the text is determined by **<text_format>**. When the text format is selected, SMS and IP Content as a string of 8bit ASCII text characters. Max 160 chars. When the binary format is selected, every 8-bit octet of the message must be written as two IRA character long hexadecimal numbers, e.g. an octet with integer value 30(I.e. 0x1E) must be written as a string of two characters "1E" (IRA 49 and 69) it must enter an uppercase letter.
<text_format>	integer	0	Format of the **<text>** parameter Values: 0 : text 1 : binary
<SMSNum>	integer	-	SMS Destination Number as string of 8bit ASCII Characters. Max 20 chars
<profile_id>	integer	N/A	PDP context identifier Value: 1÷max : numeric parameter which specifies a particular PDP context definition (see +CGDCONT command); The value of max is returned by the Test command.
<IP_protocol>	integer	N/A	IP protocol used for socket connection

Not Subject to NDA

Values:

0 : disable IP (TCP or UDP) connection

1 : TCP

2 : UDP

<IP_addr:PORT>	string	-	IPv4 server address with the socket port. Number as string of 8bit ASCII Characters. Max 25 chars

The configuration is stored in NVM.

Even though **<URC>** is set to 1 (enabled), URC is not presented to reduce time taking on power down when **<action>** is 0 (disabled) on LE910C1-EUX, LE910C1-SVX, LE910C1-SAX and LE910Cx-WWX.

AT#DGEN?

Read command returns the current Dying GASP setting according to the **<action>** set, in the format:

#DGEN:
<GPIO>,<trigger>,<action>,<URC>[,<text>,<text_format>,[<SMSNum>][,<profile_id>,<IP_protocol>,<IP_addr:PORT>]]

AT#DGEN=?

Test command reports the supported range of values of the command parameters.

<mode>,<GPIO>,<trigger>,<action>,<URC>,<text>,<text_format>,<SMSNum>,<profile_id>,<IP_protocol>,<IP_addr:PORT>

Not Subject to NDA

AT#DGEN=1,2,1,3,1,"shutdown",0,"01012345678",1,1,"192.168.0.10:8080"
OK

AT#DGEN?
#DGEN: 2,1,3,1,"shutdown",0,"01012345678",1,1,"192.168.0.10:8080"
OK

AT#DGEN=1,2,1,2,1,"shutdown",0,,1,1,"192.168.0.10:8080"
OK

AT#DGEN=1,2,1,1,1,"shutdown",0,"01012345678"
OK

AT#DGEN=1,3,0,0,1
OK

AT#DGEN=0
OK

Not Subject to NDA

3.35. Bluetooth Low Energy

3.35.1. AT#BI - BLE Initialize/De-initialize

This command is used to initialize/de-initialize the BLE stack.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#BI=<START>[,<Interface Id>]

Parameters:

Name	Type	Default	Description
<START>	integer	N/A	It specifies the initialization/de-initialization of the BLE stack. Values: 0 : De-initializes BLE stack 1 : Initializes BLE stack
<Interface Id>	integer	0	It specifies the UART port to be used for BLE interface Values: 0 : Select Aux UART port for BLE interface 1 : Select Main UART port for BLE interface

Before executing other BLE AT commands, this command must be called first to start the initialization process.

If AUX port is used for BT interface, then below commands must be issued.

Not Subject to NDA

AT#PORTCFG=16

AT#M2MATP=1

AT#BI?

Read command returns the current status in the format:
#BI:<START>,<Interface Id>

For example:
at#bi?
#BI: 1,1

OK

AT#BI=?

Test command reports supported range of values for all parameters.

Using Aux UART port for BLE interface:
To initialize BLE:
AT#BI=1,0
OK

To de-initialize BLE:
AT#BI=0,0
OK

Using main UART port for BLE interface:
To initialize BLE:
AT#BI=1,1
OK
To de-initialize BLE:
AT#BI=0,1
OK

Not Subject to NDA

3.35.2. AT#BCONNECT - BLE Connect

This command is used to establish a BLE GATT connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BCONNECT=<Bluetooth Remote Address>,<Bluetooth Address Type>

Set command is used to establish a GATT connection to a peripheral device directly via its address. For random address connection we should initiate the scan first and the desired device should be listed in scan result.

Parameters:

Name	Type	Default	Description
<Bluetooth Remote Address>	hex	-	It specifies the Bluetooth remote device address (12 hex digits) to connect. The supported parameter value range is 1-48.
<Bluetooth Address Type>	string	t2	It specifies the remote Bluetooth address type. **NOTE:** This parameter is optional and has no effect on this AT command. Only for AT command compatibility this parameter is included in the AT command. If the remote device removes bond information of previously connected C3 device, we see immediate disconnection followed by connection. The subsequent connect will succeed. Values: t2 : Public address

Not Subject to NDA

t3 : Random address

Additional info:

Asynchronous Event:

#BCONNECT: <Connection Handle>

<Connection Handle>: It specifies the connection establishment with specified handle. The connection handle must be used as characteristic access for this device.

Example:

#BCONNECT: 4

It supports a maximum of 4 connections in central role.

AT#BCONNECT=?

Test command returns the current address to which is connected.

```
AT#BCONNECT="008025D11DE4",
#BCONNECT: 1
OK
```


Not Subject to NDA

3.35.3. AT#BDISCONNECT - BLE Disconnect

This command is used to disconnect the existing Bluetooth connection.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BDISCONNECT=<CONNECTION HANDLE>

Set command is used to disconnect the existing Bluetooth connection addressed by the connection handle, from the corresponding BCONNECT event.

Parameter:

Name	Type	Default	Description
<CONNECTION HANDLE>	hex	N/A	It specifies the connection handle of the connected device.

Value:

0x1÷0xFFFF : The supported parameter value range

Additional info:

Asynchronous Event:

#BDISCONNECT: <Connection Handle>

<Connection Handle> : It specifies the connection disestablishment with specified handle.

Example:

#BDISCONNECT: 4

Not Subject to NDA

AT#BDISCONNECT?

Test command reports supported range of values for the parameter.

```
AT#BDISCONNECT=1
OK
```


Not Subject to NDA

3.35.4. AT#BSCAN - BLE Scan

This command is used to scan for all the BLE devices.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSCAN=[<Bluetooth Remote Address>]

Set command is used to discover all the BLE devices.

Parameter:

Name	Type	Default	Description
<Bluetooth Remote Address>	string	N/A	It specifies the scan results using Bluetooth remote address of the devices to be discovered. Value: 1÷48 : The supported parameter value range.

The scan time value is 5 seconds.

AT#BSCAN?

Read command returns the values of parameters in the format:

#BSCAN: <BDADDR>,<NAME>,<RSSI>

Where,

<BDADDR> - It specifies the Bluetooth device address of discoverable device.
<NAME> - It specifies the Device advertise friendly name of the discoverable device.
NOTE: The name will be displayed only if the device is advertising.
<RSSI> - It specifies the RSSI value of discoverable device.

Not Subject to NDA

AT#BSCAN=?

Test command reports supported range of values for all parameters.

```
AT#BSCAN="008025D1D6D9"
#BSCAN: 00:80:25:D1:D6:D9,BM+S50,-67
OK
AT#BSCAN="008025D1D6D9"
#BSCAN: 008025D1D6D9,,-67
OK

AT#BSCAN
#BSCAN: 1AD99D8326A7,,-52
OK
AT#BSCAN
#BSCAN: 008025D11DE4,BM+S42M/SRV 1DE4,-32
OK
```


Not Subject to NDA

3.35.5. AT#BSRVD - BLE Service Discovery

This command is used to discover the BLE services and characteristics.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSRVD=<CONNECTION HANDLE>[,<UUID OF SERVICE>,<UUID TYPE>]

Set command is used to discover the services and characteristics.

Parameters:

Name	Type	Default	Description
<CONNECTION HANDLE>	hex	N/A	It specifies the connection handle returned at the time of BLE connect command. Value: 0x1÷0xFFFF : The supported parameter value range.
<UUID OF SERVICE>	string	N/A	It specifies the UUID of the service for discovery. Value: 1÷256 : The supported parameter value range.
<UUID TYPE>	integer	N/A	It specifies the type of the UUID service for discovery. 0- 16-bit UUID 1- 128-bit UUID 2- 32-bit UUID Values: 0 : 16-bit UUID

Not Subject to NDA

1 : 128-bit UUID

2 : 32-bit UUID

AT#BSRVD?

Test command reports supported range of values for all parameters.

If the connection handle is provided it will display all available services of the device. If the same command is executed with connection handle and UUID, it will display the characteristics and properties of the UUID.

```
AT#BSRVD=1,,
#BSRVD: "UUID: AB12"
OK
AT#BSRVD= 1,"AB12",
#BSRVD: UUID: AB12
CHARUUID: 12FE
CHARHNDL: 2D
CHARPROP: 02
OK
```


Not Subject to NDA

3.35.6. AT#BREAD - BLE Read

This command is used to read the BLE characteristics value of a service.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BREAD=<Connection Handle>,<Characteristic Handle>

Set command is used to read the characteristics value of a service.

Parameters:

Name	Type	Default	Description
<Connection Handle>	hex	N/A	It specifies the connection handle returned during BLE connect command. Value: 0x1÷0xFFFF : The supported parameter value range.
<Characteristic Handle>	hex	N/A	It specifies the characteristic handle returned during service discovery. Value: 0x1÷0xFFFF : The supported parameter value range.

AT#BREAD=?

Test command reports supported range of values for all parameters.

Not Subject to NDA

AT#BREAD=1,2B

#BREAD: 1,2B,6162

OK

Not Subject to NDA

3.35.7. AT#BWRITE - BLE Write

This command is used for BLE Write.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BWRITE=<Connection Handle>,<Characteristic Handle>,<Hex Data>

Set command is used to write the characteristics value of a service.

Asynchronous Event:

#BWRITE: <Characteristic Handle>,<Hex Data>

<Characteristic Handle>: It specifies the Characteristic handle returned using service discovery command (AT#BSRVD). The supported parameter value range is "0x1-0xFFFF".

<Hex Data>: It specifies ASCII coded byte stream as hexadecimal values. For example: 6162 for a 2-byte value

Example:

#BWRITE: 55,3031323334

Parameters:

Name	Type	Default	Description
<Connection Handle>	hex	N/A	It specifies the connection handle returned at the time of BLE connect command.
	Value:		
	0x1÷0xFFFF	:	The supported parameter value range.
<Characteristic Handle>	hex	N/A	It specifies the Characteristic handle returned using service discovery command (AT#BSRVD).
	Value:		

Not Subject to NDA

	0x1÷0xFFFF : The supported parameter value range.		
<Hex Data>	hex	N/A	It specifies ASCII coded byte stream as hexadecimal values. For example: 6162 for a 2-byte value.
	Value: 0÷20 : The supported parameter value range.		

If any one of the defined characteristics in peripheral is secured, then write command initiate security procedure even though the characteristic is not secured. (Limitation)

AT#BWRITE=?

Test command returns the supported range of values for parameters

```
AT#BWRITE=1,2B,"6162"
OK
```


Not Subject to NDA

3.35.8. AT#BADVE - BLE Advertise Enable

This command is used to control the advertising behavior.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BADVE=<Advertising>

Set command is used to control the advertising behavior

Parameter:

Name	Type	Default	Description
<Advertising>	integer	N/A	It specifies the behavior of advertising. The supported parameter value range is 0-3.

Values:

0 : Advertising is ON with Customized advertising DISABLED

1 : Advertising is ON with Customized advertising being ENABLED

2 : Reserved

3 : Advertising is OFF

AT#BADVE?

Read command returns the current status in the format:

#BADVE: <ADVERTISING>

For example:
at#badve?

Not Subject to NDA

#BADVE: 3
OK

AT#BADVE=?

Test command reports supported range of values for all parameters.

To stop the advertisement.

AT#BADVE=3

OK

Not Subject to NDA

3.35.9. AT#BATTRIB - BLE Attribute Server

This command is used to define the attributes of one or more services in the GATT server.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BATTRIB=<Type>

Set command is used to define the attributes of one or more services in the GATT server. The maximum number of services and characteristics depends on the features being used.

Do not start advertising before adding any services. In case advertisement has already initiated, you should restart the BLE stack using AT#BI=0 followed by AT#BI=1. Since we support only one role at a time, this command must not be issued when C3 device as central is connected to a peripheral device.

Parameter:

Name	Type	Default	Description
<Type>	string	-	It specifies the type of services or characteristics to be used. Where, 1). "pserv" <type>="pserv". <par1>=primary service UUID (MANDATORY). For Example: AT#Battrib="PSERV","uuid=12AA" 2). "char" <type>="char". <par1>=properties(MANDATORY). 'properties' can be 02(Read), 04(Write without response), 08(Write), 10(Notify), 20(Indicate). The

Not Subject to NDA

values can be combined, for example read & notify result in 12.

<par2>=characteristic UUID(MANDATORY).

For Example:
AT#Battrib="char","prop=1A","uuid=12A1"

3) "charval"

<type>="charval".

<par1>=perm (MANDATORY).

'perm' is 16-bit hexadecimal value that decodes the access permissions and authentication requirements.

Based on 'perm' value, read and write permissions of the characteristic attribute is handled (irrespective of read and write permissions of 'properties' in AT#BTTRIB="char",...)

In 16 bits of 'perm', bits 0-3 represents read permissions; bits 4-7 represents write permissions; bits 8-15 are reserved.

Read permissions can be: 0(Read not permitted), 1(Read permitted), 2(Read with encryption permitted), 3(Read with encryption and authentication permitted)

Write permissions can be: 0(Write not permitted), 1(Write permitted), 2(Write with encryption permitted), 3(Write with encryption and authentication permitted)

For example,

'perm' value for read-write is 0011, 'perm' value for read-only with encryption is 0002

<par2>=valueLength(MANDATORY).

length range is 1-20. If length=0, the value can be between 1 to 20 ASCII coded byte stream as hexadecimal values.

<par3>=value (OPTIONAL).

Value is optional only when length=0. If 0 < length <= 20, value is ASCII coded byte stream as hexadecimal values

Not Subject to NDA

This command returns 'CharactersiticID' used for service data exchange.

Ex:AT#Battrib="charval","perm=0011","len=1","val=59"

4) "complete"

<type>="complete".

Used to signal that all attribute definitions have been sent to the controller. This command returns 'ServiceID' used for service data exchange.

For Example: AT#Battrib="complete"

AT#BATTRIB=?

Test command reports supported range of values for all parameters.

To add a new service:

AT#BATTRIB="pserv","uuid=12AA"

OK

AT#BATTRIB="char","prop=1A","uuid=12A1"

OK

AT#BATTRIB="charval","perm=0011","len=1","val=59"

#BATTRIB: "CHARID: 2"

OK

where "CHARID: 2" is CharacteristicID with Hex value '2'

AT#BATTRIB="complete"

#BATTRIB: "SRVID: 0"

OK

where "SRVID: 0" is ServiceID with Hex value 0

Not Subject to NDA

Not Subject to NDA

3.35.10. AT#BSRVDATAEX - BLE Server Data Exchange

This command sets new data in GATT server characteristics.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSRVDATAEX=<Service ID>,<Channel ID>,<Hex Data>

Set command sets new data in GATT server characteristic, where:

Channels created during GATT server definition using the command AT#BATTRIB.

Data defined for characteristics is through respective channels. If a characteristic has a length of 4, 4 bytes of hex data (ASCII coded byte stream) is sent. The variable length characteristic is defined by length 0.

All data sizes between 1 and 20 are allowed.

This command is also used to read the value of GATT server characteristic, when the data of characteristic is "?".

Parameters:

Name	Type	Default	Description
<Service ID>	integer	-	It specifies the Service identifier returned from the command AT#BATTRIB="COMPLETE".
<Channel ID>	integer	-	It specifies the Channel identifier returned from the command AT#BATTRIB="CHARVAL","...".
<Hex Data>	hex	-	It specifies the ASCII coded byte stream as hexadecimal values. For example: 4546 for a 2-byte value. It is also used to read the value of characteristic when ASCII coded byte stream is "?" Where: 0 - Advertising is ON with Customized advertising DISABLED

Not Subject to NDA

1 - Advertising is ON with Customized advertising being ENABLED
2 - Reserved
3 - Advertising is OFF

Attribute service/services should be created using AT#BATTRIB command.

AT#BSRVDATAEX=?

Test command reports supported range of values for all parameters.

To set 2-byte value "4546" to GATT server characteristic with channel 0x2 for service with serviceId 0:

AT#BSRVDATAEX=0,2,"4546"

OK

To read the value of GATT server characteristic with channel 0x2 for service with serviceId 0:

AT#BSRVDATAEX=0,2,"?"

#BSRVDATAEX: 0,2,4556

Not Subject to NDA

3.35.11. AT#BADVDATA - BLE Advertise Data

This command is used to setup the advertising data.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BADVDATA=<Include Device Name>,<Manufacturer Data>,<Service Data>,<128-bit Service UUID>

Set command is used to setup the advertising data for a customized advertising.

The maximum advertise data length can be 32 bytes. The AT command parameters represent different elements in advertise data. While setting the parameter values, make sure that the total advertise data does not exceed 32 bytes.

Parameters:

Name	Type	Default	Description
<Include Device Name>	integer	N/A	It specifies the device name to be included or not in the customized advertising data. For example, if the value is 1, the device name will be included. NOTE: To display device name in Master scan results, device name should be included in advertise data
	Value: 0,1 : The supported parameter value range.		
<Manufacturer Data>	string	N/A	It specifies the manufacturer specific data to be included in the customized advertising data. Manufacturer specific data should be provided as HEX string.

Not Subject to NDA

	Value: 1÷27 : The supported parameter value range.		
<Service Data>	string	N/A	It specifies the Service data to be included in the customized advertising data. Service data should be provided as HEX string. Value: 1÷27 : The supported parameter value range.
<128-bit Service UUID>	hex	N/A	It specifies the 128-bit UUID to be included in the customized advertising data. UUID HEX value should be 16-bit or 128-bit. If 16-bit UUID is given as input, it is converted to 128-bit UUID. Value: 2÷16 : The supported parameter value range.

Customized advertising data should be enabled using AT#BADVE command.

AT#BADVDATA=?

Test command reports supported range of values for all parameters.

Not Subject to NDA

To include the device name in advertise data:

AT#BADVDATA=1,,,

OK

To include only Telit's Manufacturer specific data as "Telit" in advertise data:

AT#BADVDATA=1,"8F0054656c6974",,

OK

To include only battery service data with value as "LED:ON" in advertise data:

AT#BADVDATA=1,,"0F184c45443a4f4e",

OK

To set battery service UUID "0F18" as 128-bit UUID in advertise data and service data:

AT#BADVDATA=1,,"0F184c45443a4f4e","0F18"

OK

Not Subject to NDA

3.35.12. AT#BSCANRSPDATA - BLE Scan Response Data

This command is used to set the BLE scan response data.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSCANRSPDATA=<Include Device Name>,<Manufacturer Data>,<Service Data>,<128-bit Service UUID>

Set command is used to set the scan response data for a customized advertising.

The maximum scan response data length can be 32 bytes. The AT command parameters represent different elements in scan response data. While setting the parameter values, make sure the total scan response data does not exceed 32 bytes.

Parameters:

Name	Type	Default	Description
<Include Device Name>	integer	N/A	It specifies the device name to be included or not in the scan response data. Value: 0,1 : The supported parameter value range.
<Manufacturer Data>	string	N/A	It specifies the manufacturer specific data to be included in the scan response data. Note: Manufacturer specific data should be provided as HEX string Value: 1÷27 : The supported parameter value range.

Not Subject to NDA

<Service Data>	string	N/A	It specifies the Service data to be included in the scan response data. Note: Service data should be provided as HEX string
	Value: 1÷27 : The supported parameter value range.		
<128-bit Service UUID>	string	N/A	It specifies the 128-bit UUID to be included in the scan response data. UUID HEX value should be 16-bit or 128-bit. If 16-bit UUID is given as input, it is converted to 128-bit UUID.
	Value: 2÷16 : The supported parameter value range.		

NOTE: Customized advertising data should be enabled using AT#BADVE command.

AT#BSCANRSPDATA=?

Test command reports supported range of values for all parameters.

Not Subject to NDA

To include the device name in advertise data:

AT#BSCANRSPDATA =1,,,

OK

To include only Telit's Manufacturer specific data as "Telit" in advertise data:

AT#BSCANRSPDATA =0,"8F0054656c6974",,

OK

To include only battery service data with value as "LED:ON" in advertise data:

AT#BSCANRSPDATA =0,,"0F184c45443a4f4e",

OK

To set only battery service UUID "0F18" as 128-bit UUID in advertise data and service data:

AT#BSCANRSPDATA =0,,"0F184c45443a4f4e","0F18"

OK

Not Subject to NDA

3.35.13. AT#BNAME - BLE Device Name

This command is used to modify the BLE local device name.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BNAME=<Local Device Name>

Set command is used to modify the local device name that is seen on a remote Bluetooth device during device or service discovery.

Parameter:

Name	Type	Default	Description
<Local Device Name>	string	-	It specifies the name of the local Device which has a limit up to 20 characters. This value can be saved into profile through AT#W command.

AT#BI=1 command and AT#BADVE=3 should be issued first. After setting the local device name, enable advertising using AT#BADVE=1

To view the device name in BLE Master scan results, the Device Name parameter should be set to value 1 in #BADVDATA command.

AT#BNAME?

Read command returns the values of parameters in the format:

#BNAME: <Local Device Name>

For Example:
AT#BNAME?

Not Subject to NDA

```
#BNAME: MyDevice
OK
```

AT#BNAME=?

Test command returns OK result code.

To set the local device name.

```
AT#BNAME="MyDevice"
OK
```


Not Subject to NDA

3.35.14. AT#BPNPPID - BLE Product ID

This command is used to set BLE product ID.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BPNPPID=<Product ID>

Set command is used to set product ID provided in the device information service (DIS). To activate a new PNPPID value, it is necessary to store the settings and perform a reset.

Parameter:

Name	Type	Default	Description
<Product ID>	hex	N/A	It specifies the value of the product ID to be set which is a 16-bit hex value.

Value:

0x0÷0xFFFF : The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BPNPPID?

Read command is used to get the status of the product ID in the device information service:

#BPNPPID: <PnP Product ID>

Where,
<PnP Product ID> - Specifies the Product ID. For example:
AT#BPNPPID?
#BPNPPID: B01A
OK

Not Subject to NDA

AT#BPNPPID=?

Test command reports supported range of values for all parameters.

To set the PnP Product ID to 0x1234.

AT#BPNPPID=1234

OK

Not Subject to NDA

3.35.15. AT#BPNPPVER - BLE Product Version ID

This command is used to set the BLE product version ID.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BPNPPVER=<Product Version>

Set command is used to set the product version provided in the device information service (DIS). To activate a new PNPPVER value, it is necessary to store the settings and perform a reset.

Parameter:

Name	Type	Default	Description
<Product Version>	hex	N/A	It specifies the version of the product to be set which is a 16-bit hex value. For example, 0x0100 for firmware version 1.00.

Value:

0x0÷0xFFFF : The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BPNPPVER?

Read command is used to get the status of the product version in the device information service:

#BPNPPVER: <PnP Product Version>

AT#BPNPPVER?

#BPNPPVER: 700

OK

Not Subject to NDA

AT#BPNPPVER=?

Test command reports the product version.

To set the PnP Product Version to 0x0100.

AT#BPNPPVER=0100

OK

Not Subject to NDA

3.35.16. AT#BPNPVID - BLE Vendor ID

This command is used to set the BLE vendor ID.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BPNPVID=<Vendor ID>

Set command is used to set the vendor ID provided in the device information service (DIS). To activate a new PNPVID value, it is necessary to store the settings and perform a reset.

Parameter:

Name	Type	Default	Description
<Vendor ID>	hex	By default, the Telit vendor ID is 0x008F.	It specifies the value of vendor ID to be set which is a 16-bit hex value.

Value:

0x0÷0xFFFF : The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BPNPVID?

Read command is used to get the status of the vendor ID in the device information service

#BPNPVID: <PnP Vendor ID>

Where,

<PnP Vendor ID> - Specifies the Vendor ID. For example:

AT#BPNPVID?

#BPNPVID: 8F

OK

Not Subject to NDA

AT#BPNPVID=?

Test command reports the vendor ID of the parameters.

To set the PnP vendor ID to 0x7890.

AT#BPNPVID=7890

OK

Not Subject to NDA

3.35.17. AT#BPNPVSRC - BLE Source Vendor ID

This command is used to set the BLE Source vendor ID.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BPNPVSRC=<Vendor ID Source>

Set command is used to set the vendor ID source provided in the device information service (DIS). To activate a new PNPVSRC value, it is necessary to store the settings and perform a reset.

Parameter:

Name	Type	Default	Description
<Vendor ID Source>	integer	N/A	It specifies the value of the vendor ID source to be set. The supported parameter value range is 1-2. This value can be saved into profile through AT#W command. Values: 1 : Bluetooth SIG assigned company ID 2 : USB assigned company ID

AT#BPNPVSRC?

Read command is used to get the status of the vendor ID source in the device information service:

#BPNPVSRC: <PnP Vendor ID Source>

Where,

<PnP Vendor ID Source> - Specifies the Vendor ID source. For example:

AT#BPNPVSRC?

Not Subject to NDA

#BPNPVSRC: 1

OK

AT#BPNPVSRC=?

Test command reports supported range of values for all parameters.

To set the PnP vendor ID source to USB assigned company ID.

AT#BPNPVSRC=2

OK

Not Subject to NDA

3.35.18. AT#BCONINTMAX - BLE Maximum Connection Interval

This command is used to configure the BLE maximum connection interval.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BCONINTMAX=<Maximum Connection Interval>

Set command is used to configure the maximum connection interval for a Bluetooth Low Energy connection.

Parameter:

Name	Type	Default	Description
<Maximum Connection Interval>	integer	N/A	It specifies the maximum connection interval for a Bluetooth Low Energy connection in milliseconds. Value: 8÷4000 : The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BCONINTMAX?

Read command is used to get the status of the maximum connection interval:

#BCONINTMAX: <Maximum Connection Interval>

Where,

<Maximum Connection Interval> - Specifies the maximum connection interval. For example:

AT#BCONINTMAX?

#BCONINTMAX: 400

Not Subject to NDA

OK

AT#BCONINTMAX=?

Test command reports supported range of values for all parameters.

To set Maximum connection Interval to 100 msec.

AT#BCONINTMAX=100

OK

Not Subject to NDA

3.35.19. AT#BCONINTMIN - BLE Minimum Connection Interval

This command is used to configure the BLE minimum connection interval.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BCONINTMIN=<Minimum Connection Interval>

Set command is used to configure the minimum connection interval for a Bluetooth Low Energy connection.

Parameter:

Name	Type	Default	Description
<Minimum Connection Interval>	integer	N/A	It specifies the minimum connection interval for a Bluetooth Low Energy connection in milliseconds. Value: 8÷4000 : The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BCONINTMIN?

Read command is used to get the status of the minimum connection interval:

#BCONINTMIN: <Minimum Connection Interval>

Where,

<Minimum Connection Interval> - Specifies the minimum connection interval. For example:

AT#BCONINTMIN?

#BCONINTMIN: 400

Not Subject to NDA

OK

AT#BCONINTMIN=?

Test command reports supported range of values for all parameters.

To set Minimum connection Interval to 600 msec.

AT#BCONINTMIN=600

OK

Not Subject to NDA

3.35.20. AT#BADVINTMAX - BLE Maximum Advertising Interval

This command is used to configure the maximum advertisement interval.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BADVINTMAX=<Maximum Advertising Interval>

Set command is used to configure the maximum advertisement interval for a Bluetooth Low Energy peripheral.

Parameter:

Name	Type	Default	Description
<Maximum Advertising Interval>	integer	N/A	It specifies maximum interval used for advertising (in milliseconds) in a Bluetooth Low Energy peripheral.
	Value:		
	20÷10240	:	The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BADVINTMAX?

Read command is used to get the status of the maximum advertising interval:

#BADVINTMAX: <Maximum Advertising Interval>

Where,

<Maximum Advertising Interval> - Specifies the maximum advertising interval. For example:

AT#BADVINTMAX?

#BADVINTMAX: 200

OK

Not Subject to NDA

AT#BADVINTMAX=?

Test command reports supported range of values for all parameters.

To set Maximum advertising Interval to 100 msec.

AT#BADVINTMAX=300

OK

Not Subject to NDA

3.35.21. AT#BADVINTMIN - BLE Minimum Advertising Interval

This command is used to configure the minimum advertisement interval.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BADVINTMIN=<Minimum Advertising Interval>

Set command is used to configure the minimum advertisement interval for a Bluetooth Low Energy peripheral.

Parameter:

Name	Type	Default	Description
<Minimum Advertising Interval>	integer	N/A	It specifies minimum interval used for advertising (in milliseconds) in a Bluetooth Low Energy peripheral. Value: 20÷10240 : The supported parameter value range. This value can be saved into profile through AT#W command.

AT#BADVINTMIN?

Read command is used to get the status of the minimum advertising interval:

#BADVINTMIN: <Minimum Advertising Interval>

Where,

<Minimum Advertising Interval> - Specifies the minimum advertising interval. For example:

AT#BADVINTMIN?

#BADVINTMIN: 100

OK

Not Subject to NDA

AT#BADVINTMIN=?

Test command reports supported range of values for all parameters.

To set Minimum advertising Interval to 100 msec.

AT#BADVINTMIN=150

OK

Not Subject to NDA

3.35.22. AT#BSLAVELAT - BLE Slave Latency

This command is used to configure the BLE slave latency.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSLAVELAT=<Slave Latency>

Set command is used to configure the slave latency during connection interval in a Bluetooth Low Energy connection.

Parameter:

Name	Type	Default	Description
<Slave Latency>	integer	The default value 0 uses no slave latency.	It specifies the slave latency in the connection intervals, in a Bluetooth Low Energy connection. Value: 0÷200 : The supported parameter value range. This value can be saved through AT#W command.

AT#BSLAVELAT?

Read command is used to get the status of the slave latency:

#BSLAVELAT: <Slave Latency>

Where,

<Slave Latency> - Specifies the slave latency.

AT#BSLAVELAT?

#BSLAVELAT: 0

OK

Not Subject to NDA

AT#BSLAVELAT=?

Test command reports supported range of values for all parameters.

To set slave latency to default (Use no slave latency).

AT#BSLAVELAT=0

OK

To set slave latency to 5 connection intervals.

AT#BSLAVELAT=5

OK

Not Subject to NDA

3.35.23. AT#W - Profile Save

This command is used to save the BLE parameters into the Flash profile.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#W

Set command saves the BLE parameters into the Flash profile.

AT#W=?

Test command returns OK result code.

```
AT#W
OK
```


Not Subject to NDA

3.35.24. AT#BSSPPIN - BLE Secure Simple Pairing PIN (SSP-PIN)

This command is used for BLE Secure Simple Pairing PIN (SSP-PIN).

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSSPPIN=<Bluetooth Address>,<Bluetooth Address Type>,<SSP Passkey>

Set command is used to generate SSPPIN during authentication.

When authentication is initiated, depending on the I/O capabilities the AT interface generates an event SSPPIN and asks the user for the SSP passkey.

Asynchronous Event: #SSPPIN:<Bluetooth address>,<,address type>,<?>

The user must answer this request with the SSP passkey displayed on the remote device. The passkey generated by the remote device is a six-digit pin which the user cannot modify.

Parameters:

Name	Type	Default	Description
<Bluetooth Address>	string	N/A	It specifies the remote Bluetooth address. Value: 1÷48 : The supported parameter value range.
<Bluetooth Address Type>	string	N/A	It specifies the remote Bluetooth address type. Where, t2 - public address, t3 - random address. Value:

Not Subject to NDA

	1,2 : The supported parameter value range.		
<SSP Passkey>	integer	N/A	It specifies the SSP passkey displayed on the remote device. Value: 0÷999999 : The supported parameter value range.

AT#BSSPPIN=?

Test command reports supported range of values for all parameters.

```
AT#BSSPPIN="00802507C08D","t2",314546
OK
```


Not Subject to NDA

3.35.25. AT#BSSPCONF - BLE Secure Simple Pairing Confirmation

This command is used for BLE Secure Simple Pairing Confirmation.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BSSPCONF=<Bluetooth Address>,<Bluetooth Address Type>,<Passkey Confirmation>

Set command is used to confirm the Security Pairing of a device. The user must confirm the passkey - if no confirmation is sent by the user within the bonding time (which is approximately 30 seconds) then the pairing is rejected.

Asynchronous Event: #SSPCONF:<Bluetooth address>,<address type>,<passkey>,<?>

Parameters:

Name	Type	Default	Description
<Bluetooth Address>	string	N/A	It specifies the remote Bluetooth address Value: 1÷48 : The supported parameter value range.
<Bluetooth Address Type>	string	N/A	It specifies the remote Bluetooth address type Where, t2- public address t3- random address Value: 0÷2 : The supported parameter value range.
<Passkey Confirmation>	integer	N/A	It specifies the confirmation request of the passkey. The

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supported parameter value range is 0-1.

Values:

0 : Reject passkey confirmation request

1 : Accept passkey confirmation request

If a pairing is initiated and LE secure connection is supported, depending on the security settings AT interface generates an event SSPCONF and asks the user for confirmation.

AT#BSSPCONF=?

Test command reports supported range of values for all parameters.

```
AT#BSSPCONF="00802507C08D","t2",1
OK
```


Not Subject to NDA

3.35.26. AT#BBNDLIST - BLE Bond List

This command is used to display information about the BLE bonded devices.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BBNDLIST

Set command is used to display information about the bonded devices. Each entry in the bonded-device list contains the Bluetooth address and Bluetooth address type (t2-BLE public Address, t3-BLE Random address).

AT#BBNDLIST?

Read command returns the values of parameters in the format:

#BBNDLIST: <BD Address>,<BD Address Type>

<BD Address> - It specifies the remote Bluetooth address.

The supported parameter value range is 1-48.

<BD Address Type> - It specifies the remote Bluetooth address type.

The supported parameter value range is 0-2.

Where,

t2- public address

t3- random address

Always printing t2.

AT#BBNDLIST=?

Test command reports supported range of values for all parameters.

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AT#BBNDLIST

#BBNDLIST: 008025D1D764,t2

OK

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3.35.27. AT#BBNDDEL - BLE Bond Delete

This command is used to delete the stored BLE bonding information.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BBNDDEL=[<BD Address>]

Set command is used to delete the stored bonding information.

Parameters:

Name	Type	Default	Description
<BD Address>	string	N/A	It specifies the remote Bluetooth address. Value: 1÷48 : The supported parameter value range.

AT#BBNDDEL=?

Test command reports supported range of values for all parameters.

```
AT#BBNDDEL="008025D1D764"
OK
AT#BBNDDEL="*"
OK
```


Not Subject to NDA

3.35.28. AT#BCCCD - BLE Client Character Configuration

This command is used for BLE Client Character Configuration.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BCCCD=<Connection Handle>,<Characteristic Handle>,<CCCD>

Set command enables or disables the notifications and indications for the characteristic feature.

Parameters:

Name	Type	Default	Description
<Connection Handle>	hex	N/A	It specifies the connection handle returned during BLE connect command. Value: 0x1÷0xFFFF : The supported parameter value range.
<Characteristic Handle>	hex	N/A	It specifies the characteristic handle returned during service discovery. Value: 0x1÷0xFFFF : The supported parameter value range.
<CCCD>	integer	N/A	It specifies the state of the Client Characteristic Configuration Descriptor. The supported parameter values range is 0-2. Values: 0 : Disables CCCD

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1 : Enables CCCD notifications

2 : Enables CCCD indications

AT#BCCCD=?

Test command reports supported range of values for all parameters.

```
AT#BCCCD =1,2B,1
OK
```


Not Subject to NDA

3.35.29. AT#WNWEBPROV - Web Provisioning

This command is used for BLE Web Provisioning.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#WNWEBPROV=<Start>

Set command is used to start the provisioning server.

Prerequisites:
L2 - L3 connections should be established.
The mode of provisioning depends on the mode in which WLAN is started.
0 - Wi-Fi AP provisioning mode is enabled
1 - Wi-Fi Client provisioning mode is enabled.

Parameter:

Name	Type	Default	Description
<Start>	integer	-	It indicates the provisioning server to start. Where: 1 - Reserved 2 - Starts the BLE provisioning server. On successful provisioning of Wi-Fi AP, the following output is displayed: **#BWNWEBPROV: <WIFIMODE>,< SSID >,<CHNL>,<PHY MODE>,<SECURITY>,<PSK PASS PHRASE>** On successful provisioning of Wi-Fi Client, the following output is displayed: **#BWNWEBPROV: <WIFIMODE>,<SSID>,<CHNL>, <SECURITY>,<WEP_ID>,<WEP_KEY>,<PSK PASS PHRASE>,<DHCP_ENBL>** Where:

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<WIFIMODE> -
0 - Wi-Fi AP
1 - Wi-Fi Client

< SSID > - It specifies the SSID of the Wi-Fi AP or Client

<CHNL> - It specifies the channel of operation of the Wi-Fi AP or Client

<PHY MODE> -
0 - 'b-only' (2.4 GHz)
1 - 'b/g' (2.4 GHz)
2 - 'b/g/n' (2.4 GHz)
3 - 'a/n' (5 GHz)
4 - 'a/n/ac' (5 GHz)

<SECURITY> -
1 - None
2 - WPA Personal
3 - WPA WEP
4 - WPA WEP Enterprise

NOTE: Currently, AP provisioning supports only <SECURTIY> 0 and 1

<PSK PASS PHRASE> - It specifies the PSK of the Wi-Fi AP or Client, if the <SECURITY> is 2
<WEP_ID> - It specifies the WEP ID of the Wi-Fi client if the <SECURITY> is 3 or 4
<WEP_KEY> - It specifies the WEP KEY of the Wi-Fi client if the <SECURITY> is 3 or 4
<DHCP_ENBL> - It indicates if the DHCP server is enabled for Wi-Fi client

NOTE: Currently, only DHCP is supported for Wi-Fi Client provisioning

AT#WNWEBPROV=?

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Test command reports supported range of values for all parameters

Web provisioning output for Wi-Fi AP provisioning:

#BWNWEBPROV: 0,telit-ap1,0,5,3,abcdef123456

Web provisioning output for Wi-Fi client provisioning:

#BWNWEBPROV: 1,dlink_test,6,0,,,,1

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3.36. Bluetooth Low Energy ASYNC AT Response

3.36.1. AT#BNOTIFY - BLE Notify

This command is used for BLE notifications.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BNOTIFY=<Connection Handle >,<Characteristic Handle>,<Hex Data>

Set command is used for BLE notifications.

Parameters:

Name	Type	Default	Description
<Characteristic Handle>	hex	-	It specifies the Characteristic handle returned using service discovery command (AT#BSRVD). The supported parameter value range is "0x1-0xFFFF".
<Hex Data>	hex	-	It specifies ASCII coded byte stream as hexadecimal values.

```
#BNOTIFY: 5,15,1234567891
```


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3.36.2. AT#BINDICATE - BLE Indication

This command is used for BLE Indication.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2

AT#BINDICATE=<Connection Handle>,<Characteristic Handle>,<Hex Data>

Set command is used for BLE Indication.

Parameters:

Name	Type	Default	Description
<Connection Handle>	integer	-	It specifies the connection handle on which INDICATE operation performed.
<Characteristic Handle>	integer	N/A	It specifies the Characteristic handle returned using service discovery command (AT#BSRVD). Value: 0x1÷0xFFFF : The supported parameter value range.
<Hex Data>	string	-	It specifies ASCII coded byte stream as hexadecimal values.

#BINDICATE: 5,15,1234567891

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4.3. Safety Recommendations

Make sure the use of this product is allowed in your country and in the environment required. The use of this product may be dangerous and has to be avoided in areas where:

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- it can interfere with other electronic devices, particularly in environments such as hospitals, airports, aircrafts, etc.
- there is a risk of explosion such as gasoline stations, oil refineries, etc. It is the responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conformed to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible for the functioning of the final product. Therefore, the external components of the module, as well as any project or installation issue, have to be handled with care. Any interference may cause the risk of disturbing the GSM network or external devices or having an impact on the security system. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed carefully in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The equipment is intended to be installed in a restricted area location.

The equipment must be supplied by an external specific limited power source in compliance with the standard EN 62368-1

The European Community provides some Directives for the electronic equipment introduced on the market. All of the relevant information is available on the European Community website:

https://ec.europa.eu/growth/sectors/electrical-engineering_en

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5. GLOSSARY

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 Frequency
DTR	Data Terminal Ready

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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
MT	*either* Mobile Terminated *or* Mobile Terminal

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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

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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. DOCUMENT HISTORY

Revision	Date	Changes
14	2022-03-04	Updated Commands: #APLAY, #ARECD, #ECALLTMR, #JDRENH2, #LWM2MSKIP, #SCFGEXT3 New Commands: $GNSSCONST
13	2022-02-09	New Document template Added LE910Cx-WWXD/ -SAXD/ -NAD/ -NFD/ -SAD variants Updated Commands: #DVI, #GTP, #GTPEN, #RXDIV, #RXTOGGLE, #SLED, +CLVL New Commands: #AVAHIEN, #CALLCFGCW, #CMAR, #DUALAPN, #MANAGEROAM, #NTP, #NTPCFG, #RATORDER, #SKIPGCF, #SMSVOL
12	2021-08-11	Deleted: #NTP, #NTPCFG
11	2021—06-04	New: #RPMCFG, #RPMCFGEXT, #ACDBEXT, #WLANEAPCERT, #WLANEAPCFG, #DUALAPN, , #MQCOPP, #MQWIPP, #MQSUPP, #MQPUPP, #MQSCFG, #BNDRAM, #SELBNDMODE Updated: 3.3.1 Factory Profile and User Profiles, #TESTMODE, #PSMURC, #REJER, #ENHRST, #MSDSEND, #ECALL, #EMAILD, +CMUX, #MQSUB, #FWAUTOSIM, #LWM2MSKIP, #GTPEN, $XTRAEN, #IMSSETTING, #GPIO, #TEMPMON, #FWTDEVICESET , #CHBHCID, #V24CFG, #PORTCFG, #OTAUPW, #DVIEXT, #DVICLK, +CGDCONT, #DVI, #MQCONN, #MQDISC, #ISMSCFG, #ENSIM2, #SS, #SI, #ST, #SH, #SCFG, #SCFGEXT, #SCFGEXT2, #SCFGEXT3, #SD, #BASE64, #SA, #SO, #SL, #SLASTCLOSURE, #SLUDP, #SRECV, #SSENDUDP, #SSENDUDPEXT, #SSEND, #SSENDEXT, #MQPUBS, #TCPATRUNCFG, #PSMWDISACFG, #FASTSHDN, #DGEN, #CLSMK, #BND, #TCPMAXWIN, #CALLDISA Added LE910C1-SV/ST/SA/SAX/SVX command in availability table
10	2021-02-05	New: #ESIMID, #ESIMPF, #ESIMPFINFO, #ESIMUPN, #ESIMGETADDR, #ESIMCAP, #ESIMPFUC, #ESIMADDPF, #ESIMMEMRST, #I2CCF, #M2MREADEXT, #M2MCHDIR, #M2MBACKUP, #M2MRAM, #M2MARG, #SDM, #STIME, #STKENV, #SYSHALT, #SWITCHATTPROF, #LABIMS, #CPBE, #PSMCTS, #IUTCFG, #IUTCFGEX, #CALLCFGCW, #CLSMK, #CRAC, #ALLOWHAC, #ARECD, #ECALLURC, #DTR, #TRACE, #PSMURC, #LWM2MSKIP, #FOTAURC Update: #GTP, #FWAUTOSIM, #PSMWDISACFG, #CQI, $GPSQOS, #TONE, #ECM, #ECMD, #ESIMGETADDR, #SI, +CEMODE, #FASTSHDN, $LCSTER, #SWREADYEN, $XTRAEN, #BND, +M2M, #M2MRUN, #M2MLIST, #M2MREAD, #M2MWRITE, #M2MDEL, #M2MMKDIR, #M2MRMDIR, #V24CFG,#V24, +CMUX, #STUNEANT, #USBCFG, #PORTCFG, +WS46, +CLVL, #DTMF, #DVICLK, #SPKMUT,

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		#DVI, #ETHCFG, #VSIMSETPROF, #VSIMLISTPROF, $LCSLPP,#SDOMAIN, #MQEN, #MQWCFG, #MQTCFG, #MQCFG2, #MQCFG2, MQCONN, #MQREAD, #MQPUBS, #MQUNS, #MQSUB, #MQDISC, #OTAUPW, #M2MATP, #ACDB, #SGACT, #SCFGEXT3, #TESTMODE, $GPSLOCK Added LE910Cx-WWX commands in availability table Replace text "Note or NOTE1..." with "NOTE"
9	2020-09-25	New: +ODIS, #PDPIMSCFGE, #MQEN, #MQWCFG, #MQTCFG, #MQCFG2, #MQCFG2, MQCONN, #MQREAD, #MQPUBS, #MQUNS, #MQSUB, #MQDISC, #VSIMSETPROF, #VSIMLISTPROF, #FWTDEVICESET, #EMRGD, #MSDPUSH, #MSDSEND, +CECALL, #MSDREAD, #ECALL, #ECALLNWTMR, #ECALLTMR, #ECONLY, #LTEULOOS, $XTRAEN Updated: #USBZLPDIS, $GPSNMUN, #GPIO, #DGEN, +CEVDP, #DVI, #DVICLK, #DVICFG, #ENCALG, #PSMWDISACFG, $LCSLPP,#SD, #SI, #ECM, #ECMD,+CEDRXRDP, +WS46, +COPS, #SPIEN, #SPICFG,#USBCFG,#PORTCFG,#V24CFG,#V24, #DTMF, #SPKMUT, #TONE, #PDPIMSCFGE, #ECM, #ECMC, +CMUX, #CMUXMODE, +CMER, #FASTSHDN,#ETHEN Replaced WE866C3 with WE866Cx under section 5.6.20 WLAN Added LE910C1-EUX/SAX/SVX command in availability table
8	2020-06-04	New: #LTESFN, #CLATENA, #CSURVL, #CSURVCL, #CSURVW, #CSURVCW, #CSURVG, #CSURVCG, #SECIFCFG, #SECIFAUTH, #SECIFPWD, #ETHCFG, #ETHSTATUS, #ETHMODE, #ETHIP, $GPSELV, #WLANMODULE, #WLANDFS, $GPSDTM, #GTPEN, #CHBHCID Updated: #VZWDM, #VZWSENDUA, #VZWFOTAURC, #DTMF, #AUTOATT, #MSCLASS, #VAUX, #CGPADDR, #SGACT, #SCFG, #SGACTCFGEXT, #SGACTCFG, #SSLCFG, #DNS, #NWDNS, #PING, #EMAILPDPCFG, #HTTPCFG, #DWCFG, #DGEN, +GCAP, #BCCHLOCK, #TESTMODE, #WLANSTART, #LTESFN, #DVI, #DVICLK, #TONE, #HSICEN, #ETHEN, #USBZLPDIS, #PORTCFG, #SPIEN, #SPICFG, #USBCFG, #V24, #V24CFG, #FASTSHDN, #HOSTODIS, #DTMF, #FTPCFG, +CLVL, #GTP, #SPKMUT, #PSAV, #GPIO,#ETHEN, +COPS, +CSMP, #SIMPR, #ENSIM2,$GPSNMUNEX, #BI,#CONNMGRSTART Deleted: #ENAOMADM, #OMASENDPIN
7	2020-01-31	New: #EXCEPINFO, #USBZLPDIS, $GPSNHZ, #BCCHLOCK, #ENAOMADM, #OMASENDPIN, #HOSTODIS, #t, #OTAUPW, #WLANCLOCK, #ETHEN, #TXCAL4G, #WNWEBPROV, #DGEN, #VZWDMACCURL, #VZWDM, #VZWFOTACFG, #VZWFOTAURC, #VZWSENDUA, #RESETINFO BLE AT Commands Set BLE ASYNC AT Response Commands Set Updated: +CFUN, #ASEND, #BND, #SGACT, #GPIO, #V24CFG, #V24, #HSICEN, +CEREG, #FRATTRIGGER, #PING, #SGACT, #CALLDISA, #ECM, #ECMC, #ECMD, #RNDIS, #RNDISC, #RNDISD, #SSLSECCFG2, #HTTPCFG, #HTTPRCV, $GPSR, $SLP, $LCSSLP, +CPLS, #TSVOL, #DVIEXT, $GPSNMUNEX, #CSURV, #CSURVC, #CSURVU, #CSURVUC, #CSURVB, #CSURVBC, #SIMSELECT, #ENSIM2, #DVI, #FWSWITCH, #TESTMODE
6	2019-11-11	New: #SIOWATERMARK, #CALLDISA, #ENSSHD

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		Updated: #TSVOL, #CSURV, #CSURVC, #CSURVU, #CSURVUC, #RNDIS, #ECM
5	2019-10-25	New: #ISEL, #WLANCMIFSEL Updated: #WLANMODE command parameters with dual AP mode feature.
4	2019-09-27	New: #PDPAUTH, #HSICEN, #WLANICMP, #WLANPING, #WLANAPCLIND, #SPIEN, #SPICFG, #CALLDISA, #OAP, #OVERRIDEPDP, #TXCAL Updated: #DVIEXT, #JDRENH2, #NASC, #ADSPC, #CODECIMS, +CGSMS, 7.1. Appendix A - Supported Bands of Variants, #TEMPCFG, #GPIO, #ACDB, #WLANCONNECT
3	2019-06-28	New: #NOPTEXT, #STUNEANT, #GTUNEANT, #KIPR, #WLANBD, #GTP Updated: #TESTMODE,#RXTOGGLE,#NOPT,$SLP,$LCSSLP,#NASC, #OOBTSET, #SL, #SLUDP, #GPIO, #GSMAD, #ENHRST, #USBCFG, +CGDCONT, #PORTCFG, #SLED, #SH,#SCFGEXT3, #SSEND, #SKTSET, #SKTD, #SKTL, #PSMWDISACFG, #SSLSECDATA, $GPSELNA, $LCSLPP, +CEVDP, +CMUX, #CMUXMODE, +CEDRXS, #SSLSECDATA, +WS46, #SSLSECDATAEXT, #WLANSSID, #WLANCONNECT, #WLANSECURITY, #SCFGEXT, #ECTD, +CSCB, $GPSQOS, $GPSSLSR
2	2019-03-12	New: #RSEN, $GPSLOCK, $AGPSEN, $LCSLPP, $LCSAGLO, #DVIEXT, #OOBTSET, $GPSDPO, $GPSELNA, $LOCMODE, $NMEA, $LOCATION, $GETLOCATION Updated: +CPSMS, #GPIO, #TESTMODE, +VZWRSRQ, #CSURVB, #CSURVBC,#DVI,#DVICFG,#DVICLK,#DVIEXT, #PCMDELAY, #CEMODE,#ADSPC,#USBCFG,#PORTCFG,S, +CPNER, #ENCALG, #GSMAD, #SWREADYEN, #BRCSFB, $LCSLPP, #MSCLASS, +COPS, +CGTFT, #SIMSELECT, #ENSIM2, #RXTOGGLE, #FASTSHDN, #PSMWDISACFG, #ISMSCFG, #SDOMAIN, #FRATTRIGGER, #GSMAD, #WLANSECURITY, #WLANMACMODE, #WLANPC, #CSURVEXT, $GNSSSLCT, #STIA, #STGI, #STSR Deleted: #LPMVBUSNOTI
1	2018-01-10	Initial version

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