FN990 Family

AT Commands Reference Guide

Preliminary Rev.0

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Telit Technical Documentation

APPLICABILITY TABLE

PRODUCTS	SOFTWARE
FN990A40	45.00.010-A001

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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 queries, support services, and to share documentation feedback, contact Telit Technical Support at:

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

Alternatively, you may visit:

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

For more information about Telit modules, visit

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:

- Hayes standard AT command set, to maintain the compatibility with existing SW programs.
- 3GPP TS 27.007 specific AT command and GPRS specific commands.
- 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's 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:

- **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.
- **Action type commands**. This type of command may be "executed" or "tested".
  - "executed" to invoke a function of the equipment, which generally involves more than the simple storage of a value for later use
  - "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:

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

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:

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

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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.

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

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

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

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 560 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.

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

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 [1]	Verbose Format [2]
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

[1] *Not all modules support the error codes shown in the table.*
[2] *There could be small variations in the message depending on the module in use.*

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Numeric Format [1]	Verbose Format [2]
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network 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
51	Parameter length error for all Auth commands
52	Temporary error for all Auth command

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Numeric Format [1]	Verbose Format [2]
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
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

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Numeric Format [1]	Verbose Format [2]
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
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

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Numeric Format [1]	Verbose Format [2]
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
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

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Numeric Format [1]	Verbose Format [2]
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)
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

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Numeric Format [1]	Verbose Format [2]
1007	SSL cannot activate
1008	SSL not connected
1009	SSL already connected
1010	SSL error enc/dec data
1011	SSL disconnected
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
1251	This APN is not allowed on this device. Please try antoher one.

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	

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Numeric Format	Meaning
128...255	
According to 3GPP TS 27.005 section 3.2.5 - Message Service Failure Result Code +CMS ERROR	
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network time-out
340	no +CNMA acknowledgement expected
500	unknown error
510	msg blocked
<err> 512 and on are manufacturer specific	
512	No SM resources
513	TR1M timeout
514	LL error
515	No response from network

Table 3: Message Service Failure Result Code

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2.2.2.3. Carriage Returns, Line Feeds and Log

Generally, the number of carriage returns **<CR>** and line feeds **<LF>** at the end of command responses may vary. This scenario may also vary from software version to software version. We do not have evidence of this behavior in URC lines.

Command responses examples:

AT#LWM2MMON?<CR>
<CR><LF>
#LWM2MMON: "4"<LF>#LWM2MMON: "3" ⚠ missing <CR>
<CR><LF>
<CR><LF>
OK
<CR><LF>
AT#LWM2MFYACKURI=0,2<CR>
<CR><LF>
#LWM2MNFYACKURI: "/3/0/9"<LF>#LWM2MNFYACKURI: "/3/0/8" ⚠ missing <CR>
<CR><LF>
<CR><LF>
OK
<CR><LF>

The user must be aware of this aspect before writing a script to parse the command lines and the relative response lines to generate a log.

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:

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

Moreover, there are two other types of result codes:

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

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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
15	CONNECT 14400
23	CONNECT 1200/75

Table 4: Result codes according to ITU-T V25Ter recommendation

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).

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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 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); 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	/	/	/

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Table 5: description of AT command short overview table

This chapter focus on the values that **Setting saved** field can assume and their meaning. The meaning of the other fields will be described in the next chapter. **Setting saved** field can have one of the values listed below:

Specific profile / Common profile	The parameters values set by the command are stored in the profile base section. Examples of the AT commands: **+IPR, E, Q, V, X, &C**, etc. The parameters values set by the command are stored in the profile extended section. Examples of the AT commands: **+CREG, +CMEE**, etc.
Auto	The parameters values set by the command are automatically stored in NVM, without issuing any storing AT command, and independently from the profile (unique values). The values are automatically restored at startup. Examples of the AT commands: **+COPS, +CGQREQ**, etc. In some cases, the parameters values are store in the file system.
Other	The parameters values set by the command are stored in NVM issuing a specific command and independently from the profile. Examples of the AT commands: **+CSCA, +CSMP** setting is saved by **+CSAS** and restored by **+CRES** command.

Note: There is no difference between "Specific profile" and "Common profile"

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:

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

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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

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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>

AT+CSTA=?

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

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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>.

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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.

AT#ACAL?

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

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#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
```

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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 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**.

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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.

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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) 2 : connecting (MO) 3 : active

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		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:

#ECAM: <onoff>

AT#ECAM=?

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

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Not Subject to NDA

3.1.7. 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; 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 1÷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.

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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)**]**

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3.1.8. 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=<n>

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

Parameter:

Name	Type	Default	Description
<n>	integer	0	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=?

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

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Not Subject to NDA

3.1.9. 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: ASYNC : asynchronous transparent data SYNC : synchronous transparent data

Preliminary Rev.0

Not Subject to NDA

REL ASYNC	:	asynchronous non-transparent data
REL SYNC	:	synchronous non-transparent data
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**>

Preliminary Rev.0

Not Subject to NDA

3.1.10. 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>

AT+CVHU=?

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

Preliminary Rev.0

Not Subject to NDA

3.2. General Control and Config

3.2.1. AT#GETFW - Get firmware status

This command used to read all modem carrier firmware information.

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

AT#GETFW

Execution command return all modem firmware information in the following format:

HOST FIRMWARE : <Host Version>
SLOT STATUS CARRIER VERSION TMCFG
<modem firmware 1 >

Carrier name has been deprecated(only for backward compatibility)

AT#GETFW=?

Test command returns **OK**.

Preliminary Rev.0

Not Subject to NDA

3.2.2. AT#ACTIVEFW - Active firmware

This command used to select active modem firmware.

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

AT#ACTIVEFW=<op_mode>,<option>

Set command active the selected modem firmware at **<slot_idx>**.

FN990 doesn't support multi modem image. This command is just for backward compatibility.

Parameters:

Name	Type	Default	Description
<op_mode>	integer	N/A	option mode Value: 1 : Active specific modem firmware by slot index
<option>	integer	N/A	number of slot index to active Value: 1 : Active modem firmware at slot 1

AT#ACTIVEFW?

Read command returns information of the activated modem carrier firmware

AT#ACTIVEFW=?

Test command returns **OK**

Preliminary Rev.0

Not Subject to NDA

3.2.3. AT#CLEARFW - Clear firmware

This command used to clear modem firmware from module.

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

AT#CLEARFW=<op_mode>

Execution command clear modem firmware from module.

FN990 doesn't support multi modem image. This command is just for backward compatibility.

Parameter:

Name	Type	Default	Description
<op_mode>	integer	N/A	option mode Value: 0 : clear all modem firmware

Slot 1 is fixed for specific firmware image and cannot be erased by this command

AT#CLEARFW=?

Test command returns **OK**.

Preliminary Rev.0

Not Subject to NDA

3.2.4. AT#FIRMWARE - Firmware

This command used to get modem firmware information.

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

AT#FIRMWARE=<mfw_idx>

Set command load the selected modem carrier firmware.

FN990 doesn't support multi modem image. This command is just for backward compatibility.

Parameter:

Name	Type	Default	Description
<mfw_idx>	integer	1	The index for the modem firmware Value: 1 : modem carrier firmware 1

Additional info:

▶▶ Execution command return all firmware information in the following format

HOST FIRMWARE : <Host Version>
MODEM FIRMWARE: <The maximum value of N>
INDEX STATUS CARRIER VERSION TMCFG CNV LOC
<modem carrier firmware 1 >

AT#FIRMWARE?

Read command returns the activated modem firmware index

#FIRMWARE: <mfw_idx>

Preliminary Rev.0

Not Subject to NDA

AT#FIRMWARE=?

Test command returns the list of supported carrier firmware index.

#FIRMWARE: (1-N)

Preliminary Rev.0

Not Subject to NDA

3.2.5. Command Line Prefixes

3.2.5.1. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.5.2. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.5.3. 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**.

Preliminary Rev 0

Not Subject to NDA

3.2.6. Generic Modem Control

3.2.6.1. 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>**.

Preliminary Rev.0

Not Subject to NDA

3.2.6.2. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.6.3. 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 Value: 0,1 : user profile number	N/A	user profile number

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

Any active call is terminated.

Preliminary Rev.0

Not Subject to NDA

3.2.6.4. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.6.5. 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**

Preliminary Rev.0

Not Subject to NDA

3.2.6.6. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.6.7. 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.

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
```

Preliminary Rev 0

Not Subject to NDA

3.2.6.8. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.6.9. 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**>.

Preliminary Rev.0

Not Subject to NDA

3.2.6.10. 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:

+GCAP: +CGSM

Additional info:

Supported Command Set:

+CGSM: GSM ETSI command set

AT+GCAP=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.2.6.11. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.12. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.13. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.14. 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>

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

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

AT+CEER=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.2.6.15. AT+GSN - Serial Number

The 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

Execution command returns the device board serial number.

The number returned is not the IMSI, but it is the board number.

AT+GSN=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.2.6.16. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.17. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.18. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.19. 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

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

AT+CGSN=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.2.6.20. 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.

Preliminary Rev 0

Not Subject to NDA

3.2.6.21. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.22. AT#CGSN - Product Serial Number Identification

This command returns the product serial number in form of IMEI of the mobile.

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

AT#CGSN

Execution command returns the product serial number in form of IMEI of the mobile, with command echo.

The response is as follows

#CGSN: <sn>

OK

AT#CGSN=?

The test command returns the **OK** result code.

Preliminary Rev 0

Not Subject to NDA

3.2.6.23. AT#SWPKGV - Request Software Package Version

This command show the software package version and its sub 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 Firmware Version>

<Production Parameters Version>
<Application Firmware Version>

OK

This command shows **<Telit Software Package Version>-<Production Parameters Version>** configured by AT#FWSWITCH

and other versions are independent of AT#FWSWITCH configuration.

if OEM config is supported, its version follow <Production Parameters Version> as below

<Production Parameters Version>-<OEM config version>

where <OEM config version> consist 3 digit number.

AT#SWPKGV=?

Test command returns **OK** result code.

Preliminary Rev 0

Not Subject to NDA

3.2.6.24. 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)

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

Preliminary Rev.0

Not Subject to NDA

'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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.25. 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 : minimum functionality (low power mode)		
	1 : mobile full functionality		
	4 : disable both TX and RX		
	6 : reset		
	7 : offline mode		
<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> full functionality		

Preliminary Rev.0

Not Subject to NDA

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

In the **<fun>=7**(offline), modem can only be changed to **<fun>=6**(reset)

AT+CFUN?

Read command reports the current setting of <**fun**>.

AT+CFUN=?

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

Preliminary Rev.0

Not Subject to NDA

3.2.6.26. 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?

When the modem is switched on all of the indicators are in registered mode.

See also command **+CMER**

Preliminary Rev.0

Not Subject to NDA

AT+CIND?

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

+CIND: <ind>[,<ind>[,...]]

Additional info:

Read command response parameter

Name	Type	Default	Description
<ind>	integer	-	indicator value, which shall be in range of corresponding <**descr**>. See test command **AT+CIND=?**

The order of the values <**ind**>s is the one returned by test command **AT+CIND=?**

AT+CIND=?

Test command returns pairs, where string value **<descr>** is a description 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**))**[,...]]**)

Additional info:

Test command response parameters

Name	Type	Default	Description
<descr>	string	N/A	indicators names, maximum 16 chars long

Values:

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

Preliminary Rev.0

Not Subject to NDA

"signal"	:	signal quality; indicator <ind> in the range 0...7, or 99 (not measurable); same as bit error rate (<ber>) in +CSQ command
"sounder"	:	sounder activity; indicator <ind> is 0 (no sound activity) or 1 (sound activity)
"service"	:	service availability; indicator <ind> is 0 (not registered to any network) or 1 (registered)
"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)

Preliminary Rev.0

Not Subject to NDA

Next command causes all the indicators to be registered

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

Next command causes all the indicators to be de-registered

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

Next command to query the current value of all indicators

AT+CIND?

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

OK

Preliminary Rev.0

Not Subject to NDA

3.2.6.27. 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 mode (after +++ was entered), all URCs stored in the buffer will be output

<keyp>	integer	0	keypad event reporting

Value:

Preliminary Rev.0

Not Subject to NDA

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 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

Preliminary Rev.0

Not Subject to NDA

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**)

Preliminary Rev.0

Not Subject to NDA

3.2.6.28. 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

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)

Preliminary Rev.0

Not Subject to NDA

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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.29. 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>

AT+CAMM=?

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

Preliminary Rev.0

Not Subject to NDA

3.2.6.30. 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:

+CPUC: <currency>,<ppu>

AT+CPUC=?

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

Preliminary Rev.0

Not Subject to NDA

3.2.6.31. 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.

AT+CCWE?

Read command reports the currently selected <**mode**> in the format:
+CCWE: <mode>

AT+CCWE=?

Preliminary Rev.0

Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.2.6.32. 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 "+")		

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>

Preliminary Rev 0

Not Subject to NDA

AT+CSVM=?

Test command reports the range for the parameters <**mode**> and <**type**>.

Preliminary Rev.0

Not Subject to NDA

3.2.6.33. 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=?

Test command returns the OK result code.

Preliminary Rev.0

Not Subject to NDA

3.2.6.34. 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>.

Preliminary Rev.0

Not Subject to NDA

3.2.6.35. 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>".

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

Preliminary Rev.0

Not Subject to NDA

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**>.

Preliminary Rev.0

Not Subject to NDA

3.2.6.36. AT#VCDISABLE - Disable Voice Call

The command used to disable the Voice Call.

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

AT#VCDISABLE=<type>

Set command set the incoming voice call function disable.

Parameter:

Name	Type	Default	Description
<type>	integer	2	Disable type

Values:

0 : Incoming call allowed.

1 : Ignore paging.

2 : Reject the voice call with cause code 88.

The setting is saved in NVM, will affect after rebooting.

When set **<type>** by 1, modem may not be able to distinguish clearly whether paging is for Voice Call at the time of receiving the Paging Message.

Usually, default value is 0 in models support the voice function.

AT#VCDISABLE?

Read command read a current value.

#VCDISABLE: <type>

Preliminary Rev.0

Not Subject to NDA

AT#VCDISABLE=?

Test command reports the supported range.

Preliminary Rev.0

Not Subject to NDA

3.2.6.37. 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

AT#ENSSHD=?

Test command reports the supported range of values

Preliminary Rev.0

Not Subject to NDA

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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.38. 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.

Preliminary Rev 0

Not Subject to NDA

3.2.6.39. 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.

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.

Preliminary Rev.0

Not Subject to NDA

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
nv	:	TC_NV
rtc	:	TC_RTC
m2m_uart	:	TC_UART
power	:	TC_POWER
ftpc	:	TC_FTPC
ati	:	TC_ATI
backup	:	TC_BACKUP

Preliminary Rev.0

Not Subject to NDA

	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**

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

Preliminary Rev.0

Not Subject to NDA

Preliminary Rev.0

Not Subject to NDA

3.2.6.40. 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.

AT+CSCS=?

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

Preliminary Rev.0

Not Subject to NDA

Preliminary Rev.0

Not Subject to NDA

3.2.6.41. 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	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

AT+PACSP=?

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

Preliminary Rev.0

Not Subject to NDA

3.2.6.42. AT#USBCFG - USB Configuration

This command sets USB configuration on the modem device.

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

AT#USBCFG=<mode>

Set command sets the USB composition according to <mode> number given, where:

Parameter:

Name	Type	Default	Description
<mode>	integer	1	USB configuration mode. Values: 0 : use 0x1072 composition file 1 : use 0x1070 composition file 2 : use 0x1071 composition file 3 : use 0x1073 composition file

Additional info:

- 0x1072: RNDIS + DIAG + ADB + NMEA + MODEM + MODEM + AUX
  0x1070: DIAG + ADB + RmNet + NMEA + MODEM + MODEM + AUX
  0x1071: DIAG + ADB + MBIM + NMEA + MODEM + MODEM + AUX
  0x1073: DIAG + ADB + ECM + NMEA + MODEM + MODEM + AUX

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

The value is stored in file system region when Set command executed and it is kept even on download case.

Preliminary Rev.0

Not Subject to NDA

AT#USBCFG?

Read command returns the current composition set by number as detailed in the section above:

0x1072 composition file return 0

0x1070 composition file return 1

0x1071 composition file return 2

0x1073 composition file return 3

AT#USBCFG=?

Test command returns the list of supported values.

Preliminary Rev.0

Not Subject to NDA

3.2.6.43. AT#USBDMOFF - Disable of DIAG channel on USB

This command enable/disable DIAG channel of USB composition.

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

AT#USBDMOFF=<disable>,<seccode>

Configure DIAG channel of USB composition.

Parameters:

Name	Type	Default	Description
<disable>	integer	0	disable / enable DIAG channel Values: 0 : Enable DIAG channel 1 : Disable DIAG channel
<seccode>	string	-	Security Code, must be "Tws!l1"

QPST can't detect DIAG channel in disabling case.

AT#USBDMOFF?

Reports the current configured values.

AT#USBDMOFF=?

Returns the list of supported values.

Preliminary Rev.0

Not Subject to NDA

Examples for this command

- Disable DIAG

  AT#USBDMOFF=1,"Tws!l1"

  OK

- Enable DIAG

  AT#USBDMOFF=0,"Tws!l1"

  OK

Preliminary Rev.0

Not Subject to NDA

3.2.6.44. 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>**.

Preliminary Rev.0

Not Subject to NDA

3.2.6.45. 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.

Preliminary Rev 0

Not Subject to NDA

3.2.6.46. 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
```

Preliminary Rev.0

Not Subject to NDA

3.2.6.47. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.48. AT#FWSWITCH - Set Active Firmware Image

Set network configuration

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

AT#FWSWITCH=<config_num>

Set command allows to active the specified network configuration.

Parameter:

Name	Type	Default	Description
<config_num>	integer	N/A	network configuration to be activated

Values:

0 : Rest of World. Generic GCF Config; Default Config

1 : North America. Generic PTCRB Config

10 : North America. AT&T Network Conifg

11 : North America. T-Mobie Netowrk Config

12 : North America. Verizon Wireless Network Config

14 : North America. Bell Network Config

15 : North America. Rogers Network Config

16 : North America. Telus Network Config

20 : Korea. SK Telecom Network Config

21 : Korea. SK Telecom Dongle Network Config

30 : Japan. NTT Docomo Network Config

31 : Japan. KDDI Network Config

40 : Australia. Telstra Network Config

Preliminary Rev.0

Not Subject to NDA

50 : Latin America. Anatel Network Config

Additional info:

- Execution command lists the supported network configuration in string format as below

  AT#FWSWITCH

  #FWSWITCH: <config_num>,<config name string>,<config version string>

  ...

  #FWSWITCH: <config_num>,<config name string>,<config version string>

  OK

This AT command performs a system reboot.

A current activated <config_num> maintained, even if new firmware updated.

AT#FWSWITCH?

Read command reports the current activated configuration in the following format:

#FWSWITCH: <config_num>

AT#FWSWITCH=?

Test command reports the range of supported values for parameters <config_num>

Preliminary Rev.0

Not Subject to NDA

Example 1. switch to AT&T config from GCF Generic config

- Example 1

  // Query current FW switch config

  AT#FWSWITCH?

  #FWSWITCH: 0

  OK

  // Switch to AT&T network config

  AT#FWSWITCH=10

  OK

  // Show the supported network config list

  AT#FWSWITCH

  #FWSWITCH: 0,"Generic GCF",P0H.000520

  #FWSWITCH: 1,"Generic PTCRB",P0H.010530

  #FWSWITCH: 10,"AT&T",P0H.100570

  ...

  #FWSWITCH: 40,"Telstra",P0H.400160

  OK

Preliminary Rev.0

Not Subject to NDA

3.2.6.49. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.50. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.6.51. 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 package version>_<product parameter version>

OK

<product parameter package version>, which indicates the package version of all network parameters and is consist of 4-digit number from 0001 to 9999

<product parameter version>, which is configured by AT#FWSWITCH and it's also shown in #SWPKGV

AT#CGMF=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.2.7. S Parameters

3.2.7.1. 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.

ATS0?

Preliminary Rev.0

Not Subject to NDA

Read command returns the current value of **S0** parameter.

Preliminary Rev.0

Not Subject to NDA

3.2.7.2. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.7.3. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.7.4. 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)

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

Preliminary Rev.0

Not Subject to NDA

3.2.7.5. 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.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Preliminary Rev.0

Not Subject to NDA

3.2.7.6. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.7.7. 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	60	defines time interval expressed in seconds Value: 1÷255 : available range

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.

Preliminary Rev.0

Not Subject to NDA

3.2.7.8. 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

Preliminary Rev 0

Not Subject to NDA

3.2.7.9. 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:

3. 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;
4. the maximum period allowed between receipt of first or second character of the three escape character sequence and receipt of the next;
5. 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÷255	:	expressed in fiftieth of a second

The minimum period **S12** has to pass after **CONNECT** result code too, before a received character is accepted as valid first character of the three escape character sequence.

ATS12?

Read command returns the current value of **S12** parameter.

The format of the numbers in output is always 3 digits, left-filled with 0s

Preliminary Rev.0

Not Subject to NDA

3.2.7.10. 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.

The format of the numbers in output is always 3 digits, left-filled with 0s.

Preliminary Rev 0

Not Subject to NDA

3.2.7.11. 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>**

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
```

Preliminary Rev.0

Not Subject to NDA

3.2.7.12. 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
```

Preliminary Rev 0

Not Subject to NDA

3.2.8. DTE - Modem Interface Control

3.2.8.1. 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**

Preliminary Rev.0

Not Subject to NDA

3.2.8.2. 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>
<n>=1	
information responses	<CR><LF> <text><CR><LF>
result codes	<CR><LF> <verboseCode><CR><LF>

Preliminary Rev.0

Not Subject to NDA

- the **<text>** portion of information responses is not affected by this setting.
- if parameter is omitted, the command has the same behavior of **ATV0**

Preliminary Rev.0

Not Subject to NDA

3.2.8.3. 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**

Preliminary Rev.0

Not Subject to NDA

3.2.8.4. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.8.5. 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 : DTR drop from active to inactive: Change to command mode while retaining the connected data call

2 : DTR drop from active to inactive: Disconnect data call, change to command mode. During the inactive state of DTR auto answer is off

If parameter is omitted, the command has the same behavior of **AT&D0**.

URC message is sent only if DTR is ON, otherwise, URC message discarded.

Preliminary Rev.0

Not Subject to NDA

3.2.8.6. 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

3 : hardware bi-directional flow control (both RTS/CTS active) (factory default)

This command has no effect on USB interface. It's only used for UART interface.

Preliminary Rev.0

Not Subject to NDA

3.2.8.7. 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 serial port 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**

&K has no Read Command. To verify the current setting of **&K**, simply check the settings of the active profile issuing **AT&V**.

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

Preliminary Rev.0

Not Subject to NDA

3.2.8.8. AT&S - Data Set Ready (DSR) Control

Set DSR behavior on serial port

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

AT&S[<n>]

Set command controls DSR behavior on serial port

Parameter:

Name	Type	Default	Description
<n>	integer	3	Configuration parameter

Values:

0 : Always High

1 : Follows carrier status

2 : High on DATA mode, Low on AT command mode

3 : Follows DTR status

If parameter is omitted, the command has the same behavior of **AT&S0**.

DSR behavior with AT&S1 work as DCD behavior with AT&C1.

Preliminary Rev.0

Not Subject to NDA

3.2.8.9. 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>

Set command specifies the **DTE** speed on UART interface;

Parameter:

Name	Type	Default	Description
<rate>	integer	115200	speed of the 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	

Preliminary Rev.0

Not Subject to NDA

921600	:	bps
2900000	:	bps
3000000	:	bps
3200000	:	bps
4000000	:	bps

AT+IPR?

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

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)

This command has no effect on **USB** interface; the DCE sends the **OK** result but the settings has no effect on serial interface

Test command example

AT+IPR=?

+IPR: (),(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,921600,2000000,2900000,3200000,3200000,3686400,4000000)

OK

Preliminary Rev.0

Not Subject to NDA

3.2.8.10. 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 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**.

Preliminary Rev.0

Not Subject to NDA

AT+IFC?

Read command returns active flow control settings.

AT&K is also used to set the flow control and it has the same effect with this command

if flow control behavior had been set with AT&K command, The changed setting value by AT&K will return

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

Preliminary Rev.0

Not Subject to NDA

3.2.8.11. 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>=1Ã·4
all the remaining result codes are enabled.

Preliminary Rev.0

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.

Preliminary Rev.0

Not Subject to NDA

3.2.8.12. 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 : Telit USB Modem 1 Port

2 : Telit USB Modem 2 Port

3 : Telit USB Aux port

4 : Telit SMD 1 port for internal application service

5 : Telit SMD 2 port for internal application service

6 : Telit SMD 3 port for AT over QMI/SSH service

7 : Telit SMD 4 port for AT over QMI/SSH service

8 : Telit SMD 5 port for AT over QMI/SSH service

URC messages sent out only on the configured ports by this command

DTE must enable DTR line to get URC messages on Telit USB ports, otherwise URC message will be discarded.

Preliminary Rev.0

Not Subject to NDA

AT#NOPT?

Read command reports the current notification port.

AT#NOPT=?

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

Preliminary Rev.0

Not Subject to NDA

3.2.8.13. 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 - Telit USB Modem 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 2 Port Values: 0 : disable URC message on port2 1 : enable URC message on port2
<port3_enable>	integer	N/A	enable port3 - Telit USB Aux Port Values:

Preliminary Rev.0

Not Subject to NDA

0 : disable URC message on port3

1 : enable URC message on port3

<port4_enable>	integer	N/A	enable port4 - Telit SMD Port for internal application service

Values:

0 : disable URC message on port4

1 : enable URC message on port4

<port5_enable>	integer	N/A	enable port5 - Telit SMD Port for internal application service

Values:

0 : disable URC message on port5

1 : enable URC message on port5

<port6_enable>	integer	N/A	enable port6 - Telit SMD Port for AT over QMI/SSH service

Values:

0 : disable URC message on port6

1 : enable URC message on port6

<port7_enable>	integer	N/A	enable port7 - Telit SMD Port for AT over QMI/SSH service

Values:

0 : disable URC message on port7

1 : enable URC message on port7

<port8_enable>	integer	N/A	enable port8 - Telit SMD Port for AT over QMI/SSH service

Values:

0 : disable URC message on port8

1 : enable URC message on port8

Preliminary Rev.0

Not Subject to NDA

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. "USB_MDM1" - Telit USB Modem 1 Port
2. "USB_MDM1" - Telit USB Modem 1 Port
3. "USB_MDM2" - Telit AUX Port
4. "SMD_1" - Telit SMD 1 Port
5. "SMD_2" - Telit SMD 2 Port
6. "SMD_3" - Telit SMD 3 Port
7. "SMD_4" - Telit SMD 4 Port
8. "SMD_5" - Telit SMD 5 Port

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

Preliminary Rev.0

Not Subject to NDA

3.2.8.14. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.9. Call (Voice and Data) Control

3.2.9.1. 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", "D","+". For backwards compatibility with landline modems, modifiers "T", "P", "R", ",", "W", "!", "@" are accepted, but have no effect.

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.

Preliminary Rev.0

Not Subject to NDA

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 Value: SM : SIM/UICC phonebook
<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

▶▶ **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

Preliminary Rev.0

Not Subject to NDA

<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.

Name	Type	Default	Description
<gprs_sc>	integer	N/A	is the GPRS Service Code, which identifies a request to use the GPRS communication
<addr>	string	-	identifies the called party in the address space applicable to the PDP.
<L2P>	string	-	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

Value:

99 : GPRS Service Code

Preliminary Rev.0

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

Preliminary Rev.0

Not Subject to NDA

3.2.9.2. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.9.3. 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**.

Preliminary Rev.0

Not Subject to NDA

3.2.9.4. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.9.5. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.9.6. 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.

Preliminary Rev.0

Not Subject to NDA

3.2.9.7. 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.

▶▶ <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)

Preliminary Rev.0

Not Subject to NDA

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**>.

Preliminary Rev.0

Not Subject to NDA

3.3. Network

3.3.1. 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**.
<number>	string	-	numeric string containing the phone number in the format **<type>**
<type>	integer	N/A	type of number Values: 129 : national numbering scheme

Preliminary Rev.0

Not Subject to NDA

145	:	international numbering scheme (contains the character "+")

AT+CNUM=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.2. 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**.

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.

Preliminary Rev.0

Not Subject to NDA

AT+COPN=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.3. 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:

0 : disable the network registration unsolicited result code

1 : enable the network registration unsolicited result code, and selects the short format

Preliminary Rev.0

Not Subject to NDA

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 3 : GSM w/EGPRS (see NOTE 3) 4 : UTRAN w/HSDPA (see NOTE 4) 5 : UTRAN w/HSUPA (see NOTE 4) 6 : UTRAN w/HSDPA and HSUPA (see NOTE 4) 7 : E-UTRAN

Preliminary Rev.0

Not Subject to NDA

13 : E-UTRA-NR dual connectivity(see NOTE 8)

<lac>, <ci> and <AcT> network information is reported by URC only if <mode>=2, and the module is registered on some network cell.

NOTE 3: 3GPP TS 44.018 [156] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

NOTE 4: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

NOTE 8: 3GPP TS 38.331 [160] specifies the information which, if present, indicates that the serving cell is supporting dual connectivity of E-UTRA with NR and is connected to an EPS core.

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>.

Preliminary Rev.0

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

Preliminary Rev.0

Not Subject to NDA

3.3.4. 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)

"OX" : BOIC-exHC (Barr Outgoing International Calls except to Home Country)

Preliminary Rev.0

Not Subject to NDA

"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 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

Preliminary Rev.0

Not Subject to NDA

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.

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

Preliminary Rev.0

Not Subject to NDA

3.3.5. 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) "SC" : SIM (PIN request) "P2" : SIM PIN2

Preliminary Rev.0

Not Subject to NDA

"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

Preliminary Rev.0

Not Subject to NDA

3.3.6. 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)

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>

Preliminary Rev.0

Not Subject to NDA

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=?

Test command reports the supported values of parameter <n>

Preliminary Rev.0

Not Subject to NDA

3.3.7. AT+COLP - Connected Line Identification Presentation

This command enables/disables the presentation of the COL at the TE.

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>

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.

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:

Preliminary Rev.0

Not Subject to NDA

129	:	unknown type of number and ISDN/Telephony numbering plan
145	:	international type of number and ISDN/Telephony numbering plan (contains the character "+")

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?

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 on the GSM network Values: 0 : COLP not provisioned 1 : COLP provisioned 2 : unknown (e.g. no network is present)

Preliminary Rev.0

Not Subject to NDA

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**>.

Preliminary Rev.0

Not Subject to NDA

3.3.8. 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

3 : adds an held call to the conversation

4 : connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer (ECT))

Preliminary Rev.0

Not Subject to NDA

"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,

6. conference call <**n**>=2X and <**n**>=4 parameter not supported.
7. 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**>.

Preliminary Rev.0

Not Subject to NDA

3.3.9. 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>]

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

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 "+"

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

Preliminary Rev.0

Not Subject to NDA

AT+CTFR=?

Test command tests for command existence

Preliminary Rev.0

Not Subject to NDA

3.3.10. 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)
<str>	string	-	USSD-string (when <**str**> parameter is not given, network is not interrogated)

8. If <**dcs**> indicates that 3GPP TS 23.038 default alphabet is used ME/TA converts GSM alphabet into current TE character set (see **+CSCS**).

Preliminary Rev.0

Not Subject to NDA

		9.	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

AT+CUSD?

Read command reports the current value of the parameter <**n**>

AT+CUSD=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.11. 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>

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)

Preliminary Rev.0

Not Subject to NDA

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.

+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.

Preliminary Rev.0

Not Subject to NDA

3.3.12. 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
	Values:		
	0 : active		

Preliminary Rev.0

Not Subject to NDA

	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 (refer to 3GPP 24.008) Values: 128 : both the type of number and the numbering plan are unknown 129 : national numbering scheme 145 : international numbering scheme (contains the character "+")

Preliminary Rev.0

Not Subject to NDA

	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 **+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,

10. conference call participant's numbers start with "sip:" or "tel:", for example: sip:+12125551212

AT+CLCC=?

Test command returns **OK** result code

Preliminary Rev.0

Not Subject to NDA

3.3.13. 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 unsolicited result code is sent to **TE** **+CSSU: <code2>** Values: 0 : disable 1 : enable

Unsolicited fields:

Preliminary Rev.0

Not Subject to NDA

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

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>.

Preliminary Rev.0

Not Subject to NDA

3.3.14. 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)

<info>	integer	0	information added to the CUG

Values:

Preliminary Rev.0

Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.3.15. 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 a set or an execution command. It enables/disables unsolicited channel codec information reports, or returns the channel codec info, in both case according to 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 the URC of the channels codecs information, see info section 1 : enable the URC of the channels codecs information only if the codec changes, see info section 2 : enable the short URC of the channels codecs information only if the codec changes, see info section

Preliminary Rev 0

Not Subject to NDA

Additional info:

- <**mode**>=1, the URC of the channels codecs information is displayed 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 short URC of the channels codecs information is displayed as shown below:

  #CODECINFO: <codec_used>

  The <**codec_used**> format dependes 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:

  #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

Preliminary Rev.0

Not Subject to NDA

		4 : half rate speech 1 on TCH 8 : full rate speech 3 – AMR on TCH 16 : half rate speech 3 – AMR on TCH 128 : full data 9.6 129 : full data 4.8 130 : full data 2.4 131 : half data 4.8 132 : half data 2.4 133 : full data 14.4 134 : full rate AMR wide band 135 : UMTS AMR version 2 136 : UMTS AMR wide band
<codec_set>	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 - FR-AMR-WB, full rate AMR wide band 64 - UMTS-AMR-V2, UMTS AMR version 2 128 - UMTS-AMR-WB, UMTS AMR wide band 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

Preliminary Rev.0

Not Subject to NDA

		HR :	half rate speech 1 on TCH
		FAMR :	full rate speech 3 – AMR on TCH
		HAMR :	half rate speech 3 – AMR on TCH
		FD96 :	full data 9.6
		FD48 :	full data 4.8
		FD24 :	full data 2.4
		HD48 :	half data 4.8
		HD24 :	half data 2.4
		FD144 :	full data 14.4
		FAWB :	full rate AMR wide band
		UAMR2 :	UMTS AMR version 2
		UAWB :	UMTS AMR wide band
<codec_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 FAWB : full rate AMR wide band UAMR2 : UMTS AMR version 2 UAWB : UMTS AMR wide band	

The command refers to codec information in speech call, and to channel mode in data call.

Preliminary Rev.0

Not Subject to NDA

If **AT#CODEC=0**, the reported channels codecs set, for <**format**>=0, is 255 (all codecs).

AT#CODECINFO?

Read command reports <f**ormat**> and <**mode**> parameter values in the format:

#CODECINFO: <format>,<mode>

AT#CODECINFO=?

Test command returns the range of supported <**format**> and <**mode**> parameters values.

Preliminary Rev.0

Not Subject to NDA

3.3.16. 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.

If trying to set + CPLS which is not in supported range, an error would be returned.

Preliminary Rev.0

Not Subject to NDA

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.

Preliminary Rev.0

Not Subject to NDA

3.3.17. AT+CSQ - Signal Quality

Execution command returns received signal strength indication <**rssi**> and channel bit error rate <**ber**> from the MT.

3GPP TS 27.007
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:

3G Networks

The execution command returns the following message:

+CSQ: <rssi>,<ecio>

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
			2÷30 : -109 dBm ... -53 dBm; 2 dBm per step
			31 : -51 dBm or greater
			99 : not known or not detectable
<ecio>	integer	N/A	Chip energy per total wideband power in dBm. For <ecio> levels are mapped to range 0...7.

Preliminary Rev.0

Not Subject to NDA

Values:

0 : -1...0

1 : -5...-2

2 : -8...-6

3 : -11...-9

4 : -15...-12

5 : -18...-16

6 : -22...-19

7 : -24...-23

99 : not known or not detectable

▶▶ 4G Networks

The execution command returns the following message:

+CSQ: <rssi>,<rsrq>

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

Preliminary Rev.0

Not Subject to NDA

<rsrq>	integer	N/A	Reference Signal Received Quality. For **<rsrq>** 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

For UMTS, the current radio signal strength indicates CPICH RSCP in levels.

For UMTS, radio signal quality CPIC Ec/Io range -24dB to 0dB is scaled to 0 to 7.

AT+CSQ=?

Test command returns values supported as compound values.

Preliminary Rev.0

Not Subject to NDA

3.3.18. 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.

WCDMA network

#SERVINFO: <UARFCN>, <dBM>, <NetNameAsc>,<NetCode>,<PSC>,<LAC>,<DRX>,<SD>,<RSCP>, <NOM>,<RAC>

LTE network

#SERVINFO: <EARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<CID>,<TAC>,<DRX>,<SD>,<RSRP>

LTE network with NR (ENDC)

#SERVINFO: <EARFCN>,<dBM>,[<NetNameAsc>],<NetCode>,<CID>,<TAC>,<DRX>,<SD>,<RSRP>,<NR_CH>,<NR_ULCH><NR_RSSI>,<NR_RSRP>,<NR_RSRQ>

NR (SA)

#SERVINFO: <NR_CH>,<NR_ULCH><NR_RSSI>,<NR_RSRP>,<NR_RSRQ>

The parameters are described in the Additional info sections.

Additional info:

▶▶ Parameters meaning.

Name	Type	Default	Description
<NetNameAsc>	string	-	operator name, quoted string or "" if network name is unknown.

Preliminary Rev 0

Not Subject to NDA

<NetCode>	hex	-	country code and operator code.
<LAC>	integer	-	Localization Area Code
<dBM>	integer	-	received signal strength in dBm
<UARFCN>	integer	-	UMTS ARFCN of the serving cell
<PSC>	integer	-	Primary Synchronization Code

▶▶ 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.

▶▶ Parameters meaning.

Name	Type	Default	Description
<DRX>	integer	-	Discontinuous reception cycle length.
<SD>	integer	N/A	Service Domain Values: 0 : No Service 1 : CS only 2 : PS only

Preliminary Rev.0

Not Subject to NDA

3 : CS & PS			
<RSCP>	integer	-	Received Signal Code Power in dBm.
<EARFCN>	integer	-	LTE Assigned Radio Channel
<CID>	integer	-	Cell Identifier
<TAC>	integer	-	Tracking Area Code
<RSRP>	integer	-	Reference Signal Received Power
<NR_CH>	integer	-	NR DL active channel
<NR_ULCH>	integer	-	NR UL active channel
<NR_RSSI>	integer	-	NR received signal strength in dBm
<NR_RSRP>	integer	-	NR Reference Signal Received Power
<NR_RSRQ>	string	-	NR Reference Signal Received Quality

AT#SERVINFO=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.3.19. 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

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.

Preliminary Rev.0

Not Subject to NDA

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)

Preliminary Rev.0

Not Subject to NDA

3.3.20. 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=<GSM_band>[,<UMTS_band>[,<LTE_band>[,<LTE_band_ext>[,<NSA_NR5G_band_1_64>[,<NSA_NR5G_band_65_128>[,<SA_NR5G_band_1_64>[,<SA_NR5G_band_65_128>]]]]]]]

Set command selects the current WCDMA, LTE and NR5G bands.

Parameters:

Name	Type	Default	Description
<GSM_band>	integer	0	GSM band selection. Values: 0 : GSM 900MHz + DCS 1800MHz 1 : GSM 900MHz + PCS 1900MHz 2 : GSM 850MHz + DCS 1800MHz 3 : GSM 850MHz + PCS 1900MHz 4 : GSM 900MHz + DCS 1800MHz + PCS 1900MHz 5 : GSM 850MHz + GSM 900MHz + DCS 1800MHz + PCS 1900MHz
<UMTS_band>	integer	N/A	WCDMA band selection. Values: 0 : 2100MHz (FDD I) 1 : 1900MHz (FDD II) 2 : 850MHz (FDD V)

Preliminary Rev.0

Not Subject to NDA

3 : 2100MHz (FDD I) + 1900MHz (FDD II) + 850MHz (FDD V)

4 : 1900MHz (FDD II) + 850MHz (FDD V)

5 : 900MHz (FDD VIII)

6 : 2100MHz (FDD I) + 900MHz (FDD VIII)

7 : 1700MHz (FDD IV)

8 : 2100MHz (FDD I) + 850MHz (FDD V)

9 : 2100MHz (FDD I) + 900MHz (FDD VIII) + 850MHz (FDD V)

10 : 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V)

11 : 2100MHz (FDD I) + 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) + 900MHz (FDD VIII)

22 : 2100MHz (FDD I) + 1900MHz (FDD II) + 1700MHz (FDD IV) + 850MHz (FDD V) + JAPAN850MHz (FDD VI) + 900MHz (FDD VIII) + JAPAN800(FDD XIX)

<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 64 bits):

Band number(Hex)	Band i
0	disable
1	B1
2	B2
4	B3
8	B4
...	...
80000000	B32
...	...
800000000000	B48

Value:

Preliminary Rev.0

Not Subject to NDA

0÷A7E2BB0F38DF : range of the sum of Band number (1+2+4 ...)

<LTE_band_ext>	hex	N/A	Indicates the LTE supported bands from B65 expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 64 bits):

Band number(Hex)	Band i
0	disable
2	B66
40	B71

Value:

0÷42 : range of the sum of Band number (2+40)

<NSA_NR5G_band_1_64>	hex	N/A	Indicates the NSA NR5G supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 64 bits):

Band number(Hex)	Band i
0	disable
1	n1
2	n2
4	n3
8	n4
...	...
80000000	n32
...	...
800000000000	n48

Value:

0÷81A0090808D7 : range of the sum of Band number (1+2+4 ...)

<NSA_NR5G_band_65_128>	hex	N/A	Indicates the NSA NR5G supported bands from B65expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 64 bits):

Band number(Hex)	Band i

Preliminary Rev.0

Not Subject to NDA

0	disable
2	n66
40	n71
1000	n77
2000	n78
4000	n79

Value:

0÷7042 : range of the sum of Band number (2+40+1000 ...)

<SA_NR5G_band_1_64>	hex	0	Indicates the SA NR5G supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 64 bits):

Band number(Hex)	Band i
0	disable
1	n1
2	n2
4	n3
8	n4
...	...
80000000	n32
...	...
800000000000	n48

Values:

0÷10009000047 : range of the sum of Band number (1+2+4 ...)

0 : Not support

<SA_NR5G_band_65_128>	hex	N/A	Indicates the SA NR5G supported bands from B65expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 64 bits):

Band number(Hex)	Band i
0	disable
2	n66
40	n71
1000	n77
2000	n78
4000	n79

Preliminary Rev.0

Not Subject to NDA

Value:

0÷6042 : range of the sum of Band number (2+40+1000 ...)

This setting is maintained even after power off. **<GSM_band>, <UMTS_band>** parameters are decimal value.
<LTE_band>,<LTE_band_ext>,<NSA_NR5G_band_1_64>,<NSA_NR5G_band_65_128>,<SA_NR5G_band_1_64> and **<SA_NR5G_band_65_128>** parameters are hex format value and band set should be entered in HEX format without "0x".

The **<LTE_band>** and **<LTE_band_ext>** cannot be set to 0 at the same time.

If the one of NR5G bands is changed, the reboot process have to be needed for proper band search behavior.

The NR5G bands cannot be set to 0 at the same time.

This module use fixed unused value 0 for **<GSM_band>** parameter. For any variants which cannot support WCDMA, the **<UMTS_band>** is fixed unused value 0.

Supported band for each network provider.

<GCF>

5G FR1 NSA : 1,2,3,5,7,8,12,20,25,28,38,40,41,48,66,71,77,78,79

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,43,46,48,66,71

WCDMA : 1,2,4,5,6,8,19

GSM : Not Supported

<NTT>

5G FR1 NSA : 2,5,7,12,20,25,38,40,48,66,71,77,78,79 (N1,3,8,28 and 41 are not supported by default, but it can be enabled through #BND command)

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,43,46,48,66,71

WCDMA : 1,2,4,5,6,8,19

GSM : Not Supported

Preliminary Rev.0

Not Subject to NDA

<TELSTRA>

5G FR1 NSA : 2,5,8,12,20,25,38,40,41,48,66,71,77,78,79 (N1,3,7 and 28 are not supported by default, but it can be enabled through #BND command)

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,43,46,48,66,71

WCDMA : 1,2,4,5,6,8,19

GSM : Not Supported

<KDDI>

5G FR1 NSA : 78 (N1,2,3,5,7,8,12,20,25,28,38,40,41,48,66,71,77,79 are not supported by default, but it can be enabled through #BND command)

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,3,18,26,28,41,42 (B2,4,5,7,8,12,13,14,17,19,20,25,29,30,32,34,38,39,40,43,46,48,66,71 are not supported by default, but it can be enabled through #BND command)

WCDMA : 1,2,4,5,6,8,19

GSM : Not Supported

<VZW, SPRINT>

5G FR1 NSA : 1,2,3,5,7,8,12,20,25,28,38,40,41,48,66,71,77,78,79

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,2,3,4,5,7,8,12,13,14,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,43,46,48,66,71

WCDMA : Not Supported

GSM : Not Supported

<PTCRB/TMO/BELL/ROGERS/TELUS>

5G FR1 NSA : 1,2,3,5,7,8,12,20,25,28,38,40,41,48,66,71,77,78,79

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,2,3,4,5,7,8,12,13,14,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,43,46,48,66,71

WCDMA : Not Supported

GSM : Not Supported

<ATT>

5G FR1 NSA : 2,5,12,66 (N1,3,7,8,20,25,28,38,40,41,48,71,78,79 are not supported by default, but it can be enabled through #BND command)

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Not Subject to NDA

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 2,4,5,12,14,26,29,30,46,48,66 (B1,3,7,8,13,18,19,20,25,28,32,34,38,39,40,41,42,43,71 are not supported by default, but they can be enabled through #BND command)

WCDMA : Not Supported

GSM : Not Supported

<ANATEL>

5G FR1 NSA : 1,2,3,5,7,8,12,20,25,28,38,40,41,48,66,71,77,78,79

5G FR1 SA : Not supported by default, but N1,2,3,7,25,28,41,66,71,78 and 79 can be enabled through #BND command.

LTE : 1,2,3,4,5,7,8,12,13,14,18,19,20,25,26,28,29,30,32,34,38,40,41,42,43,46,48,66,71

WCDMA : Not Supported

GSM : Not Supported

<SKT/SKTD>

5G FR1 NSA : 78

5G FR1 SA : Not supported by default, but N78 can be enabled through #BND command.

LTE : 1,3,5,7,8

WCDMA : Not Supported

GSM : Not Supported

AT#BND?

Read command returns the current selected band in the format:

#BND:
<band>,<UMTS_band>,<LTE_band>,<LTE_band_ext>,<NSA_NR5G_band_1_64>,<NSA_NR5G_band_65_128>,<SA_NR5G_band_1_64>,<SA_NR5G_band_65_128>

AT#BND=?

Test command returns the supported range of values of parameters **<band>, <UMTS_band><LTE_band>,<LTE_band_ext>,<NSA_NR5G_band_1_64>,<NSA_NR5G_band_65_128>,<SA_NR5G_band_1_64> and <SA_NR5G_band_65_128>.**

Preliminary Rev.0

Not Subject to NDA

Test command

```
AT#BND=?
#BND: (0),(0-21),(A7E2BB0F38DF),(42),(81A0090808D7),(7042),(10009000047),(6042)

OK
```

Read command

```
AT#BND?
#BND: 0,21,A7E2BB0F38DF,42,81A0090808D7,7042,0,0

OK
```

Read command indicates the supported bands.

Preliminary Rev.0

Not Subject to NDA

3.3.21. 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	2	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 1 in KDDI operator.

AT+CEMODE?

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

+CEMODE: < mode >

Not Subject to NDA

Preliminary Rev.0

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

Preliminary Rev.0

Not Subject to NDA

3.3.22. 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>]

This command enables/disables reporting of primary notification events with the following unsolicited result code.

+CPNERU: **<message_identifier>,<serial_number>,<warning_type>**

Primary notification events 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(default)

Unsolicited fields:

Name	Type	Description
<message_identifier>	string	string type in hexadecimal character format. The parameter contains the message identifier (2 bytes) of the primary notification.
<serial_number>	string	string type in hexadecimal character format. The parameter contains the serial number (2 bytes) of the primary notification.
<warning_type>	string	string type in hexadecimal character format. The parameter contains the warning type (2 bytes) of the primary notification.

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Not Subject to NDA

AT+CPNER?

Read command reports the current value of the parameter.

AT+CPNER=?

Test command returns supported of parameter.

```
AT+CPNER?
+CPNER: 1
OK
```

Preliminary Rev.0

Not Subject to NDA

3.3.23. AT+CESQ - Extended Signal Quality

Execution command returns received signal quality parameters.

[1] 3GPP TS 27.007
[2] 3GPP TS 45.008
[3] 3GPP TS 25.133
[4] 3GPP TS 26.133
[5] 3GPP TS 38.133

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

AT+CESQ

Execution command reports received signal quality parameters in the form:

+CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<ss_rsrq>,<ss_rsrp>,<ss_sinr>

Additional info:

▶▶

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

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Not Subject to NDA

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 (in percent)

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:

0 : rscp < -120 dB

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, 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 dBm

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Not Subject to NDA

1	:	-24 dBm ≤ Ec/Io < -23.5 dBm
2	:	-23.5 dBm dBm ≤ Ec/Io < -23 dBm
...	:	...
47	:	-1 dBm ≤ Ec/Io < -0.5 dBm
48	:	-0.5 dBm ≤ Ec/Io < 0 dBm
49	:	0 dBm ≤ Ec/Io
255	:	not known, 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)

Values:

0	:	rsrq < -19.5 dBm
1	:	-19.5 dBm ≤ rsrq < -19 dBm
2	:	-19 dBm ≤ rsrq < -18.5 dBm
...	:	...
32	:	-4 dBm ≤ rsrq < -3.5 dBm
33	:	-3.5 dBm ≤ rsrq < -3 dBm
34	:	-3 dBm ≤ rsrq
255	:	not known, not detectable or if the current serving cell is not a EUTRA 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

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Not Subject to NDA

...	:	...
95	:	-46 dBm ≤ rsrp < -45 dBm
96	:	-45 dBm ≤ rsrp < -44 dBm
97	:	-44 dBm ≤ rsrp
255	:	not known, not detectable or if the current serving cell is not a EUTRA cell

<ss_rsrq>	integer	0	synchronization signal based reference signal received quality (see 3GPP TS 38.133 [169] subclause 10.1.11)

Values:

0	:	ss_rsrq < -43 dB
1	:	-43 dB ≤ ss_rsrq < -42.5 dB
2	:	-42.5 dB ≤ ss_rsrq < -42 dB
...	:	...
124	:	18.5 dB ≤ ss_rsrq < 19 dB
125	:	19 dB ≤ ss_rsrq < 19.5 dB
126	:	19.5 dB ≤ ss_rsrq < 20 dB
255	:	not known or not detectable

<ss_rsrp>	integer	0	synchronization signal based reference signal received power (see 3GPP TS 38.133 [169] subclause 10.1.6)

Values:

0	:	ss_rsrp < -156 dBm
1	:	-156 dBm ≤ ss_rsrp < -155 dBm
2	:	-155 dBm ≤ ss_rsrp < -154 dBm
...	:	...

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Not Subject to NDA

		125 : -32 dBm ≤ ss_rsrp < -31 dBm 126 : -31 dBm ≤ ss_rsrp 255 : not known or not detectable	
<ss_sinr>	integer	0	synchronization signal based signal to noise and interference ratio (see 3GPP TS 38.133 [169] subclause 10.1.16) Values: 0 : ss_sinr < -23 dB 1 : -23 dB ≤ ss_sinr < -22.5 dB 2 : -22.5 dB ≤ ss_sinr < -22 dB ... : ... 125 : 39 dB ≤ ss_sinr < 39.5 dBm 126 : 39.5 dB ≤ ss_sinr < 40 dB 127 : 40 dB ≤ ss_sinr 255 : not known or not detectable

This project does not support the GSM access technology.

AT+CESQ=?

Test command returns values supported as compound values.

Preliminary Rev.0

Not Subject to NDA

3.3.24. AT#EONS - Enable URC of Enhanced Operator Name String

This command is used to set URC and activation feature of EONS.

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

AT#EONS=<ena>

Set command enables URC & feature of EONS. Unsolicited result code (URC) available format:

#EONS: <net>

Parameter:

Name	Type	Default	Description
<ena>	integer	1	-
	Values:		
	0 : Disable URC & feature of EONS		
	1 : Enable URC & feature of EONS		

Unsolicited field:

Name	Type	Description
<net>	string	Alpha tag of network name. Name string can be any network name as well as EONS and sent by its priority. The following order of priority for which "name source" is to used.
		Values:
		1 : EF-SPN
		2 : EF-OPL and EF-PNN
		3 : CPHS Operator Name String
		4 : Name Information received by the NITZ service

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Not Subject to NDA

5	:	Any name stored internal to the ME
6	:	Displaying the broadcast MCC-MNC

AT#EONS?

Read command returns the current selected parameter in the format:

#EONS: <ena>[,<net>]

Name string is shown only when network service is available.

AT#EONS=?

Test command returns the supported range of values of parameters **<ena>**.

Preliminary Rev.0

Not Subject to NDA

3.3.25. 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	38	WDS-Side Stack to be used by the **TA**.
	Values:		
	22 :		UTRAN only
	28 :		E-UTRAN only
	31 :		UTRAN and E-UTRAN
	36 :		NG-RAN only
	37 :		NG-RAN and E-UTRAN
	38 :		NG-RAN, E-UTRAN and UTRAN
	40 :		NG-RAN and UTRAN

<n> parameter setting is stored in NVM.

Available **<n>** parameters in PTCRB/ATT/TMO/VZW/ANATEL/BELL/ROGERS/TELUS : 28,**37**(default:37)

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Not Subject to NDA

Available **<n>** parameters in others : 22,28,31,37,**38**(default:38)

Available <n> parameters for each variant model can be changed by the network provider's requirement.

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>**.

Preliminary Rev.0

Not Subject to NDA

3.3.26. 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. 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

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Not Subject to NDA

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 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)

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Not Subject to NDA

<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 (not applicable) 4 : UTRAN w/HSDPA (not applicable) 5 : UTRAN w/HSUPA (not applicable) 6 : UTRAN w/HSDPA and HSUPA (not applicable) 7 : E-UTRAN 13 : E-UTRA-NR dual connectivity (see NOTE 8)

NOTE 8: 3GPP TS 38.331 [160] specifies the information which, if present, indicates that the serving cell is supporting dual connectivity of E-UTRA with NR and is connected to an EPS core.

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**>.

Preliminary Rev.0

Not Subject to NDA

3.3.27. AT+C5GREG - 5GS Network Registration Status

This command monitors the 5GS network registration status in NR.

3GPP TS 38.331

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

AT+C5GREG=[<mode>]

Set command enables/disables the 5GS network registration unsolicited result code (URC) in NR, and selects one of the available formats:

short format: **+C5GREG: <stat>**
long format: **+C5GREG: <stat>[,[<tac>],[<ci>],[<AcT>],[<Allowed_NSSAI_length>],[<Allowed_NSSAI>]]**

<tac>, **<ci>**, and **<AcT>**,**<Allowed_NSSAI_length>**,**<Allowed_NSSAI>** 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 triggers the URC: 11. URC short format is displayed every time there is a change in the 5GS network registration status 12. URC long format is displayed every time there is a change of network cell in NR

Values:

0 : disable the network registration unsolicited result code

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Not Subject to NDA

1 : enable the network registration unsolicited result code, and select the short format - TBD

2 : enable the network registration unsolicited result code, and selects the long format (includes the network cell identification data) - TBD

Unsolicited fields:

Name	Type	Description
<stat>	integer	5GS 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. (e.g. out of NR 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 and 3GPP TS 24.301 specify the condition when the MS is considered as attached for emergency bearer services (not applicable)

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Not Subject to NDA

		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	NR 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 (not applicable) 4 : UTRAN w/HSDPA (not applicable) 5 : UTRAN w/HSUPA (not applicable) 6 : UTRAN w/HSDPA and HSUPA (not applicable) 7 : E-UTRAN(not applicable) 11 : NR connected to a 5GCN 12 : NG-RAN (not applicable) 13 : E-UTRA-NR dual connectivity (see NOTE 8) (not applicable)
<Allowed_NSSAI_length>	integer	Indicates the number of octets of the **<Allowed_NSSAI>** information element
<Allowed_NSSAI>	string	Dependent of the form, the string can be separated by dot(s), semicolon(s). This parameter indicates the list of allowed S-NSSAIs received from the network. The **<Allowed_NSSAI>** is coded as a list of

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Not Subject to NDA

	<S-NSSAI>s separated by colons. Refer parameter **<S-NSSAI>** in subclause 10.1.1. This parameter shall not be subject to conventional character conversion as per **+CSCS**.

NOTE 8: 3GPP TS 38.331 [160] specifies the information which, if present, indicates that the serving cell is supporting dual connectivity of E-UTRA with NR and is connected to an EPS core.

AT+C5GREG?

Read command returns the current value of **<mode>**, the registration status **<stat>**, and the information **<tac>**, **<ci>**, **<AcT>**, **<Allowed_NSSAI_length>**, **<Allowed_NSSAI>** according to the current **<mode>** parameter value.

+C5GREG: <mode>,<stat>[,[<tac>],[<ci>],[<AcT>][,<Allowed_NSSAI_length>],[Allowed_NSSAI>]]

<tac>, **<ci>** and **<AcT>**,**<Allowed_NSSAI_length>**,**<Allowed_NSSAI>** are reported only if **<mode>**=2 and the mobile is registered on some network cell.

AT+C5GREG=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.28. AT+CEN - Reading and reporting of emergency numbers

This command allows for reading and dynamical reporting of emergency numbers as received from the network.

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

AT+CEN=[<reporting>]

Set command enables reporting of new emergency numbers received from the network

Parameter:

Name	Type	Default	Description
<reporting>	integer	0	Enable/disable reporting
	Values:		
	0 : Disable reporting		
	1 : Enable reporting		

AT+CEN?

Read command returns one line of intermediate result code **+CEN1: <reporting>,<mcc>** with the current **<reporting>** setting and the Mobile Country Code **<mcc>**. Then follows zero or more occurrences of the emergency numbers with intermediate result code **+CEN2: <cat>,<number>**:

+CEN1: <reporting>[,<mcc>,<mnc>]
<CR><LF>[+CEN2: <cat>,<number>
[<CR><LF>+CEN2: <cat>,<number>
[...]]]

Additional info:

- where:

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Not Subject to NDA

Name	Type	Default	Description
<reporting>	integer	-	as above
<mcc>	string	-	A three-digit value indicating mobile country code
<mnc>	string	-	A three-digit value indicating mobile network code
<cat>	string	-	Emergency Service Category Value
<number>	string	-	Representing an emergency number from the list

AT+CEN=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.29. 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.

WCDMA network

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

Parameters	Description
<PLMN>	Country code and operator code (MCC, MNC)
<UARFCN>	UMTS Assigned Radio Channel
<PSC>	Active PSC(Primary Synchronization Code)
<Ec/Io>	Active Ec/Io(chip energy per total wideband power in dBm)
<RSCP>	Active RSCP (Received Signal Code Power in dBm)
<RSSI>	Received Signal Strength Indication
<LAC>	Localization Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power
<DRX>	Discontinuous reception cycle Length(cycle length : display using ms)
<MM>	Mobility Management
<RRC>	Radio Resource Control
<NOM>	Network Operator Mode
<BLER>	Block Error Rate(005 means 0.5 %)
<CID>	Cell ID(Hexadecimal character format).
<IMSI>	International Mobile Station ID
<NetNameAsc>	Operation Name, Quoted string type
<SD>	Service Domain (0 : No Service, 1 : CS only, 2 : PS only, 3 : CS+PS)
<nAST>	Number of Active Set(Maximum 6)
<nUARFCN>	UARFCN of n th active set
<nPSC>	PSC of n th active set
<nEc/Io>	Ec/Io of n th active Set

Parameter/values	Description
<MM>	Mobility Management state (for debug purpose only)

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Not Subject to NDA

0	NULL
3	LOCATION UPDATING INITIATED
5	WAIT FOR OUTGOING MM CONNECTION
6	CONNECTION ACTIVE
7	IMSI DETACH INITIATED
8	PROCESS CM SERVICE PROMPT
9	WAIT FOR NETWORK COMMAND
10	LOCATION UPDATE REJECTED
13	WAIT FOR RR CONNECTION LOCATION UPDATE
14	WAIT FOR RR CONNECTION MM
15	WAIT FOR RR CONNECTION IMSI DETACH
17	WAIT FOR REESTABLISHMENT
18	WAIT FOR RR ACTIVE
19	IDLE
20	WAIT FOR ADDITIONAL OUTGOING MM CONNECTION
21	CONNECTION ACTIVE GROUP TRANSMIT
22	WAIT RR CONNECTION GROUP TRANSMIT
23	LOCATION UPDATING PENDING
24	IMSI DETACH PENDING
25	RR CONNECTION RELEASE NOT ALLOWED
255	UNKNOWN

Parameter/values	Description
<RR>	Radio Resource state (for debug purpose only)
0	INACTIVE
1	GOING_ACTIVE
2	GOING_INACTIVE
3	CELL_SELECTION
4	PLMN_LIST_SEARCH
5	IDLE
6	CELL_RESELECTION
7	CONNECTION_PENDING
8	CELL_REESTABLISH
9	DATA_TRANSFER
10	NO_CHANNELS
11	CONNECTION_RELEASE
12	EARLY_CAMPED_WAIT_FOR_SI
13	W2G_INTERRAT_HANDOVER_PROGRESS
14	W2G_INTERRAT_RESELECTION_PROGRESS
15	W2G_INTERRAT_CC_ORDER_PROGRESS
16	G2W_INTERRAT_RESELECTION_PROGRESS
17	WAIT_FOR_EARLY_PSCAN
18	GRR
19	G2W_INTERRAT_HANDOVER_PROGRESS
21	W2G_SERVICE_REDIRECTION_IN_PROGRESS
22	RESET
29	FEMTO
30	X2G_RESEL
31	X2G_RESEL_ABORTED
32	X2G_REDIR
33	G2X_REDIR
34	X2G_CGI

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Not Subject to NDA

35	X2G_CCO_FAILED
36	X2G_CCO_ABORTED
37	X2G_CCO_FAILED_ABORTED
40	RR_CELL_SELECTED_ACQUIRE_SI
41	RR_STATE_MAX

Parameters	Descriptions
<RRC>	Radio Resource Control state for 3G (for debug purpose only)
0	IDLE
2	CELL FACH
3	CELL DCH
4	CELL PCH
5	URA PCH

Parameters	Descriptions
<RRC>	Radio Resource Control state for 4G (for debug purpose only)
0	IDLE
2	CELL DCH

LTE network

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

Parameters	Description
<PLMN>	Country code and operator code(MCC, MNC)
<EARFCN>	E-UTRA Assigned Radio Channel
<RSRP>	Reference Signal Received Power
<RSSI>	Received Signal Strength Indication
<RSRQ>	Reference Signal Received Quality
<TAC>	Tracking Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power (In traffic only)
<DRX>	Discontinuous reception cycle Length (cycle length in ms)

Parameter/values	Description
<MM>	Mobility Management state (for debug purpose only)
0	NULL
1	DEREGISTERED
2	REGISTRATION INITIATED
3	REGISTERED
4	TRACKING AREA UPDATE INITIATED
5	SERVICE REQUEST INITIATED
6	DEREGISTRATION INITIATED

Preliminary Rev.0

Not Subject to NDA

Parameters	Description
<RRC>	Radio Resource state (for debug purpose only; see above)
<CID>	Cell ID

Parameter/values	Description
<IMSI>	International Mobile Station ID<SD> - Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS

Parameter/values	Description
<NetNameAsc>	Operation Name, Quoted string type or "" if network name is unknown
<SD>	Service Domain (0: No Service, 1: CS only, 2: PS only, 3: CS+PS)

Parameters/values	Description
<ABND>	Active Band
1..63	According to 3GPP TS 36.101

LTE network with NR (ENDC)

#RFSTS:<PLMN>,<EARFCN>,<RSRP>,<RSSI>,<RSRQ>,<TAC>,<RAC>,[<TXPWR>],<DRX>,<MM>,<RRC>,<CID>,<IMSI>,[<NetNameAsc>],<SD>,<ABND>,<NR_CH>,<NR_ULCH>,<NR_RSRP>,<NR_RSSI>,<NR_RSRQ>,<NR_BAND>,<NR_BW>,<NR_ULBW>,<NR_TXPWR>

NR (SA)

#RFSTS:<PLMN>,<NR_CH>,<NR_ULCH>,<NR_RSRP>,<NR_RSSI>,<NR_RSRQ>,<NR_BAND>,<NR_BW>,<NR_ULBW>,[<NR_TXPWR>]

Parameters	Description
<PLMN>	Country code and operator code(MCC, MNC)
<EARFCN>	E-UTRA Assigned Radio Channel
<RSRP>	Reference Signal Received Power
<RSSI>	Received Signal Strength Indication
<RSRQ>	Reference Signal Received Quality
<TAC>	Tracking Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power (In traffic only)
<DRX>	Discontinuous reception cycle Length (cycle length in ms)

Parameter/values	Description
<MM>	Mobility Management state (for debug purpose only)
0	NULL

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Not Subject to NDA

1	DEREGISTERED
2	REGISTRATION INITIATED
3	REGISTERED
4	TRACKING AREA UPDATE INITIATED
5	SERVICE REQUEST INITIATED
6	DEREGISTRATION INITIATED

Parameters	Description
<RRC>	Radio Resource state (for debug purpose only; see above)
<CID>	Cell ID

Parameter/values	Description
<IMSI>	International Mobile Station ID**<SD>** - Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS

Parameter/values	Description
<NetNameAsc>	Operation Name, Quoted string type or "" if network name is unknown
<SD>	Service Domain (0: No Service, 1: CS only, 2: PS only, 3: CS+PS)

Parameters/values	Description
<ABND>	Active Band
1..63	According to 3GPP TS 36.101

Parameters/values	Description
<NR_CH>	NR DL active channel
<NR_ULCH>	NR UL active channel
<NR_RSRP>	NR Reference Signal Received Power
<NR_RSSI>	NR received signal strength in dBm
<NR_RSRQ>	NR Reference Signal Received Quality
<NR_BAND>	NR active band
<NR_BW>	NR DL bandwidth
<NR_ULBW>	NR UL bandwidth
<NR_TXPWR>	NR Tx Power (In traffic only), When there is no traffic, tx_power is blank.

AT#RFSTS=?

Test command tests for command existence.

Preliminary Rev.0

Not Subject to NDA

Preliminary Rev.0

Not Subject to NDA

3.3.30. AT+C5GNSSAI - 5GS NSSAI setting

This command enables the update of the default configured NSSAI stored at the MT.

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

AT+C5GNSSAI=<default_configured_nssai_lngth>,<default_configured_nssai>

The set command enables updating the default configured NSSAI stored at the MT.

If <default_configured_nssai_length> has a value of zero and <default_configured_nssai> consists of an empty string, the default configured NSSAI stored at the MT, if any, shall be deleted by the MT.

Parameters:

Name	Type	Default	Description
<default_configured_nssai_lngth>	integer	-	indicates the length in octets of the default configured NSSAI to be stored at the MT
<default_configured_nssai>	string	-	string type in hexadecimal format. Dependent of the form, the string can be separated by dot(s), semicolon(s) and colon(s). This parameter indicates the list of S-NSSAIs included in the default configured NSSAI to be stored by the MT. The <default_configured_nssai> is coded as a list of <S-NSSAI>s separated by colons. If the value is an empty string (""), no default configured NSSAI is stored at the MT.

AT+C5GNSSAI?

The read command returns the current parameter values.

+C5GNSSAI: [<default_configured_nssai_length>,<default_configured_nssai>]

Preliminary Rev.0

Not Subject to NDA

AT+C5GNSSAI=?

The test command returns the values supported as compound values.

Command is supported only in 5G NR mode

Preliminary Rev.0

Not Subject to NDA

3.3.31. 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 WCDMA/LTE/NR related information.

After entering the set command, enter the execution command **AT#MONI**<CR> to get the WCDMA/LTE/NR 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:

▶▶ WCDMA network

Name	Type	Default	Description
<number>	integer	0	WCDMA network

Values:

0 : it is the active set

1 : it is the candidate set

2 : it is the synchronized neighbor set

3 : it is the asynchronized neighbor set

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Not Subject to NDA

4 : it is the ranked neighbor set(cells which are not suitable cells to camp on)

5,6 : it is not available

7 : it is a special request to obtain information from the whole set of detected 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 WCDMA neighbor cells

4 : it is the GSM neighbor cells

5÷7 : it is not available

▶▶ issuing **AT#MONI**<CR> indicates the following WCDMA/LTE-related information for selected cell and dedicated channel(if exists).

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

a) When extracting data for the serving cell and the network name is known the format is:

WCDMA network

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

LTE network

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#MONI: <netmame> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm DRX:<drx>

LTE network with NR (ENDC)

#MONI: <netmame> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm DRX:<drx> NR_BAND:<nr_band> NR_BW:<nr_bandwidth> NR_ULBW:<nr_ul_bandwidth> NR_CH:<nr_channel> NR_ULCH:<nr_ul_channel> NR_PWR:<nr_rssi>dbm NR_RSRP:<nr_rsrp> NR_RSRQ:<nr_rsrq> NR_PCI:<nr_pci> NR_SINR:<nr_sinr> NR_STATE:<nr_state> NR_TXPWR:[<nr_txpwr>] NR_DLMOD:<nr_dl_mod> NR_ULMOD:<nr_ul_mod>

NR (SA)

#MONI: <netmame> NR_BAND:<nr_band> NR_BW:<nr_bandwidth> NR_ULBW:<nr_ul_bandwidth> NR_CH:<nr_channel> NR_ULCH:<nr_ul_channel> NR_PWR:<nr_rssi>dbm NR_RSRP:<nr_rsrp> NR_RSRQ:<nr_rsrq> NR_PCI:<nr_pci> NR_SINR:<nr_sinr> NR_STATE:<nr_state> NR_TXPWR:[<nr_txpwr>] NR_DLMOD:<nr_dl_mod> NR_ULMOD:<nr_ul_mod>

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

WCDMA network

#MONI: Cc:<cc> Nc:<nc> PSC:<psc> RSCP:<rscp> LAC:<lac> Id:<id> EcIo:<ecio> UARFCN:<uarfcn> PWR:<dBm>dbm DRX:<drx> SCR:<scr>

LTE network

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

LTE network with NR (ENDC)

#MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm DRX:<drx> NR_BAND:<nr_band> NR_BW:<nr_bandwidth> NR_ULBW:<nr_ul_bandwidth> NR_CH:<nr_channel> NR_ULCH:<nr_ul_channel> NR_PWR:<nr_rssi>dbm NR_RSRP:<nr_rsrp> NR_RSRQ:<nr_rsrq> NR_PCI:<nr_pci> NR_SINR:<nr_sinr> NR_STATE:<nr_state> NR_TXPWR:[<nr_txpwr>] NR_DLMOD:<nr_dl_mod> NR_ULMOD:<nr_ul_mod>

LTE network with NR (SA)

#MONI: Cc:<cc> Nc:<nc> NR_BAND:<nr_band> NR_BW:<nr_bandwidth> NR_ULBW:<nr_ul_bandwidth> NR_CH:<nr_channel> NR_ULCH:<nr_ul_channel> NR_PWR:<nr_rssi>dbm NR_RSRP:<nr_rsrp> NR_RSRQ:<nr_rsrq> NR_PCI:<nr_pci> NR_SINR:<nr_sinr> NR_STATE:<nr_state> NR_TXPWR:[<nr_txpwr>] NR_DLMOD:<nr_dl_mod> NR_ULMOD:<nr_ul_mod>

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Not Subject to NDA

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

WCDMA network

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

LTE network

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

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

LTE network with NR (ENDC)

#MONI: RSRP:<rsrp> RSRQ:<rsrq> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm NR_BAND:<nr_band> NR_BW:<nr_bandwidth> NR_ULBW:<nr_ul_bandwidth> NR_CH:<nr_channel> NR_ULCH:<nr_ul_channel> NR_PWR:<nr_rssi>dbm NR_RSRP:<nr_rsrp> NR_RSRQ:<nr_rsrq> NR_PCI:<nr_pci> NR_SINR:<nr_sinr> NR_STATE:<nr_state> NR_TXPWR:[<nr_txpwr>] NR_DLMOD:<nr_dl_mod> NR_ULMOD:<nr_ul_mod>

LTE network with NR (SA)

#MONI: RSRP:<rsrp> RSRQ:<rsrq> Id:<id> EARFCN:<earfcn> PWR:<dBm>dbm NR_BAND:<nr_band> NR_BW:<nr_bandwidth> NR_ULBW:<nr_ul_bandwidth> NR_CH:<nr_channel> NR_ULCH:<nr_ul_channel> NR_PWR:<nr_rssi>dbm NR_RSRP:<nr_rsrp> NR_RSRQ:<nr_rsrq> NR_PCI:<nr_pci> NR_SINR:<nr_sinr> NR_STATE:<nr_state> NR_TXPWR:[<nr_txpwr>] NR_DLMOD:<nr_dl_mod> NR_ULMOD:<nr_ul_mod>

Name	Type	Default	Description
<netname>	string	-	name of network operator
<cc>	string	-	country code
<nc>	string	-	network operator code
<lac>	string	-	localization area code
<id>	integer	-	cell identifier
<uarfcn>	integer	-	UMTS assigned radio channel
<dBm>	integer	-	received signal strength in dBm.

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<rscp>	integer	-	Received Signal Code Power in dBm.
<ecio>	integer	-	chip energy per total wideband power in dBm
<drx>	integer	-	Discontinuous reception cycle length
<psc>	integer	-	primary synchronisation code
<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<tac>	integer	-	Tracking Area Code
<rsrp>	integer	-	Reference Signal Received Power
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<scr>	integer	-	Scrambling code
<nr_band>	integer	-	NR active band
<nr_bandwidth>	integer	-	NR DL bandwidth
<nr_ul_bandwidth>	integer	-	NR UL bandwidth
<nr_channel>	integer	-	NR DL active channel
<nr_ul_channel>	integer	-	NR UL active channel
<nr_rssi>	integer	-	NR received signal strength in dBm
<nr_rsrp>	integer	-	NR Reference Signal Received Power
<nr_rsrq>	integer	-	NR Reference Signal Received Quality
<nr_pci>	integer	-	NR physical cell id
<nr_sinr>	integer	-	NR measured SINR
<nr_state>	integer	N/A	NR state Values: 0 : init

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	1 : idle 2 : connected		
<nr_txpwr>	integer	-	NR Tx Power (In traffic only). When there is no traffic, tx_power is blank.
<nr_dlmod>	integer Values: 0 : BPSK 1 : QPSK 2 : 16QAM 3 : 64QAM 4 : 256QAM 5 : Unknown	N/A	Downlink modulation
<nr_ulmod>	integer Values: 0 : BPSK 1 : QPSK 2 : 16QAM 3 : 64QAM 4 : 256QAM 5 : Unknown	N/A	Uplink modulation

Preliminary Rev.0

Not Subject to NDA

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

WCDMA network

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

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

b) the other rows report a set of information for all detected neighbour cells:

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

See above for parameters description.

When 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 NR information is not affected by **<number>**.

AT#MONI=?

Test command reports the maximum number of cells, in a neighbor of the serving cell excluding it, from which we can extract WCDMA/LTE related information, along with the ordinal number of the current selected cell, in the format:

#MONI: (<MaxCellNo>,<CellSet>)

where:

<MaxCellNo> - maximum number of cells, in a neighbour of the serving cell and excluding it, from which we can extract GSM-related information. This value is always 6.

<CellSet> - the last setting done with command #MONI.

Additional info:

Parameters meaning.

Name	Type	Default	Description

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Not Subject to NDA

<MaxCellNo>	integer	-	maximum number of cells in a neighbor of the serving cell and excluding it from which we can extract WCDMA/LTE related information. This value is always **6**.
<CellSet>	integer	-	last setting done with command **#MONI**.

Preliminary Rev.0

Not Subject to NDA

3.3.32. AT#ICMCONNECT - Control Data call DISCONNECT/CONNECTADD/DELETE

This command establishes data call for Multiple PDN

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

AT#ICMCONNECT=<cmd>,<pdn>,<userIpType>[,<cid0>[,<cid1>]]

This command establishes data call, referring to the PDP profile specified by the Cid and makes it possible that ECM/RNDIS could bind the activated data service and have access to external internet.

Parameters:

Name	Type	Default	Description
<cmd>	string	N/A	Command
	Values:		
	DIS : disconnect		
	CON : connect		
	DEL : delete PDN		
	ADD : add PDN		
	SET : set PDN		
<pdn>	integer	N/A	PDN profile index. In the case of add PDN (i.e. **<cmd>** is "ADD"), the set value of **<pdn>** will be ignored, which means no matter what the input value is, the PDN will be added in numerical order if the command executed successfully.
	Value:		
	1÷4 : PDN index		
<userIpType>	integer	4	user IP type
	Values:		

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Not Subject to NDA

4 : IPv4

6 : IPv6

10 : ipv4v6 (option used only if the <cmd> is “ADD” or “SET”)

<cid0>	integer	N/A	PDP context identification (see **+CGDCONT** command). **<cid0>** represent the cid with IPV4 type when **<cmd>** is "ADD" or "SET" with 5 arguments. If **<cmd>** is "CON" or "SET" with 4 arguments, **<cid0>** represent the cid with the input **<userIpType>** IP type. Value: 1÷max : max is where the value of max is returned by the Test command
<cid1>	integer	N/A	PDP context identification with IPV6 type (see **+CGDCONT** command), valid only if **<cmd>** is "ADD" or "SET" with 5 arguments. Value: 1÷max : max is where the value of max is returned by the Test command

This command activates a specified PDP context, so all necessary operations have to be done before issuing the command like registering to network and configuring PDP profiles.

The "OK" result code does not guarantee that data is connected successfully. It is recommended that User should verify the status of connection by issuing read command.

Error is returned if cid profile is not valid or already used by other PDN index while adding PDN profile. Refer to +CDGCONT to set cid profile.

When the IPV4 or IPV6 data call already established for the specific PDN, if user want to change the cid profile which mapping to this PDN, we recommend to disconnect the data call first and then change the PDN by "SET" command option.

If VLAN interface is defined in the VLAN list and has been mapped to the corresponding PDN, VLAN interface could be brought up by using this AT command. It is possible to bring up multiple network interfaces simultaneously which consist of both ECM/RNDIS primary interface and VLAN interfaces over the ECM/RNDIS. The multiple interfaces come to have dedicated data paths to each APN defined by the corresponding cid.

Preliminary Rev.0

Not Subject to NDA

AT#ICMCONNECT?

Read command returns the session state in the following format:

Additional info:

▶▶ **#ICMCONNECT: <pdn>,<cid0>,<ipv4State>,<cid1>,<ipv6State>**

#ICMCONNECT: <pdn>,<cid0>,<ipv4State>,<cid1>,<ipv6State>

OK

Name	Type	Default	Description
<cid0>	integer	N/A	IPV4 cid
	Value: 1÷max : max is where the value of max is returned by the Test command		
<ipv4State>	integer	N/A	IPv4 connection state
	Values: 0 : disconnected 1 : connected -1 : Invalid CID		
<cid1>	integer	N/A	IPV6 CID
	Value: 1÷max : max is where the value of max is returned by the Test command		
<ipv6State>	integer	N/A	IPV6 state
	Values: 0 : disconnected 1 : connected -1 : Invalid CID		

Preliminary Rev.0

Not Subject to NDA

AT#ICMCONNECT=?

Test command returns the range of supported values for all the parameters. Note that the range of **<cid0>** and **<cid1>** will following the setting of **+CGDCONT** command.

AT#ICMCONNECT=?

#ICMCONNECT: ("DIS","CON","DEL","ADD","SET"),(1-1),(4,6,10),(1-1),(1-1)

OK

Note that the valid **<pdn>** range will be returned by test command.

Preliminary Rev.0

Not Subject to NDA

```
//Check the default value
AT# ICMCONNECT?
#ICMCONNECT: 1,1,0,1,0
OK
//Check the range of supported values
AT#ICMCONNECT=?
#ICMCONNECT: ("DIS","CON","DEL","ADD","SET"),(1-1),(4,6,10),(1-1),(1-1)
OK
//Add a cid
AT+CGDCONT=1,"IPV4V6","APN1"
OK
//Add the second cid
AT+CGDCONT=2,"IPV4V6","APN2"
OK
//Cid is added successfully by checking with Test command
AT#ICMCONNECT=?
#ICMCONNECT: ("DIS","CON","DEL","ADD","SET"),(1-1),(4,6,10),(1-2),(1-2)
OK
//Add the second PDN profile with cid 2
AT#ICMCONNECT=add,1,10,2,2
OK
//PDN is added successfully
AT#ICMCONNECT?
#ICMCONNECT: 1,1,0,1,0
#ICMCONNECT: 2,2,0,2,0
OK
//Establish data call for IPV4
AT#ICMCONNECT=con,1,4
OK
//Check the status
AT#ICMCONNECT?
#ICMCONNECT: 1,1,1,1,0
#ICMCONNECT: 2,2,0,2,0
OK
//Disconnect IPV4 data call
AT#ICMCONNECT=dis,1,4
OK
//Establish data call for IPV6
```

Preliminary Rev.0

Not Subject to NDA

AT#ICMCONNECT=con,1,6

OK

//Disconnect IPV6 data call

AT#ICMCONNECT=dis,1,6

OK

//Delete the added PDN:

AT#ICMCONNECT=del,2

OK

//PDN is deleted successfully

AT#ICMCONNECT?

#ICMCONNECT: 1,1,0,1,0

OK

Preliminary Rev.0

Not Subject to NDA

3.3.33. AT#ICMROAMINGEN - Restrict or allow data call in roaming area

Restrict or allow data call in roaming area

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

AT#ICMROAMINGEN=<pdn>,<enable>

Restrict or allow data call in roaming area

Parameters:

Name	Type	Default	Description
<pdn>	integer	N/A	PDN profile index. In the case of add PDN (i.e. **<cmd>** is "ADD"), the set value of **<pdn>** will be ignored, which means no matter what the input value is, the PDN will be added in numerical order if the command executed successfully. Value: 1÷4 : PDN index
<enable>	integer	N/A	toggle roaming allowance Values: 0 : disable roaming 1 : enable roaming

AT#ICMROAMINGEN?

Read command returns the session state in the following format:

Additional info:

▶▶ #ICMROAMINGEN: <pdn> <enabled>
#ICMROAMINGEN: <pdn> <enabled>
#ICMROAMINGEN: <pdn> <enabled>
OK

Preliminary Rev.0

Not Subject to NDA

Name	Type	Default	Description
<pdn>	integer	N/A	PDN profile index. In the case of add PDN (i.e. **<cmd>** is "ADD"), the set value of **<pdn>** will be ignored, which means no matter what the input value is, the PDN will be added in numerical order if the command executed successfully. Value: 1÷4 : PDN index
<enable>	integer	0	toggle roaming allowance Values: 0 : disable roaming 1 : enable roaming

AT#ICMROAMINGEN=?

AT#ICMROAMINGEN=?

#ICMROAMINGEN=(1-4),(0,1)

Preliminary Rev.0

Not Subject to NDA

3.3.34. AT+RSRP - Read RSRP measurement value

Additional AT&T specific AT command used for certification tests.

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

AT+RSRP?

Read command reports the RSRP measurement info in the format:

+RSRP: <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

AT+RSRP=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.35. AT+RSRQ - Read RSRQ measurement value

Additional AT&T specific AT command used for certification tests.

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

AT+RSRQ?

Read command reports the RSRQ measurement info in the format:

+RSRQ: <cellID1>,<EARFCN1>,<RSRQ1>[,<cellID2>,<EARFCN2>,<RSRQ2>[,...[,<cellIDn>,<EARFCNn>,<RSRQn>]]]

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
<RSRQx>	integer	-	RSRQ measured value

AT+RSRQ=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.36. AT+RSCP - Read RSCP measurement value

Additional AT&T specific AT command used for certification tests.

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

AT+RSCP?

Read command reports the RSCP measurement info in the format:

+RSCP: <psc1>,<UARFCN1>,<RSCP1>[,<psc2>,<UARFCN2>,<RSCP2>[,...
[,<pscn>,<UARFCNn>,<RSCPn>]]]

Additional info:

- Here are the parameters meaning:

Name	Type	Default	Description
<pscx>	integer	-	Primary scrambling code (3 digits)
<UARFCNx>	integer	-	UARFCN for the given cell
<RSCPx>	integer	-	RSCP value in dBm

AT+RSCP=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.37. AT+ECNO - Read ECNO measurement value

Additional AT&T specific AT command used for certification tests.

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

AT+ECNO?

Read command reports the ECNO measurement info in the format:

+ECNO: <psc1>,<UARFCN1>,<ECNO1>[,<psc2>,<UARFCN2>,<ECNO2>[,...
[,<pscn>,<UARFCNn>,<**ECNO**n>]]]

Additional info:

Here are the parameters meaning:

Name	Type	Default	Description
<pscx>	integer	-	Primary scrambling code (3 digits)
<UARFCNx>	integer	-	UARFCN for the given cell
<ECNOx>	integer	-	ECNO value in dBm

AT+ECNO=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.38. 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:

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)

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<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: 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>**.

Preliminary Rev.0

Not Subject to NDA

3.3.39. 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:

Name	Type	Description
<number>	string	phone number of format specified by <**type**>
<type>	integer	type of address octet Values:

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Not Subject to NDA

		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).

AT+CLIP?

Read command returns the presentation status of the CLI in the format:

+CLIP: <enable>,<status>

Additional info:

Parameters:

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Not Subject to NDA

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**>.

Preliminary Rev.0

Not Subject to NDA

3.3.40. 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. Values: 0 : COLR not provisioned 1 : COLR provisioned 2 : unknown (example: no network, etc.)

Preliminary Rev.0

Not Subject to NDA

Activation, deactivation, registration and erasure of the supplementary service COLR are not applicable.

AT+COLR=?

Test command tests for command existence

Preliminary Rev.0

Not Subject to NDA

3.3.41. 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		
	1 : enable		
	2 : query status		

Preliminary Rev.0

Not Subject to NDA

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) 13. **1** voice(telephony) 14. **2** data 15. **4** fax (facsimile services) (not supported by LTE) 16. **8** short message service 17. **16** data circuit sync 18. **32** data circuit async 19. **64** dedicated packet access 20. **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: 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>]][...]]

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Not Subject to NDA

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**>.

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

Preliminary Rev.0

Not Subject to NDA

3.3.42. 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: 0 : disable 1 : enable 2 : query status

Preliminary Rev.0

Not Subject to NDA

<class>	integer	7	sum of integers each representing a class of information which the command refers to; default is 7 (voice + data + fax) 21. **1** voice(telephony) 22. **2** data 23. **4** fax (facsimile services) 24. **8** short message service 25. **16** data circuit sync 26. **32** data circuit async 27. **64** dedicated packet access 28. **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
<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

Preliminary Rev.0

Not Subject to NDA

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.

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>**.

Preliminary Rev.0

Not Subject to NDA

3.3.43. 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)

<format>	integer	0	specifies the operator name format, see **<oper>** parameter

Values:

0 : alphanumeric long form (max length 16 digits)

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Not Subject to NDA

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
<AcT>	integer	N/A	access technology selected

Values:

0 : GSM

2 : UTRAN

7 : E-UTRAN

12 : NG-RAN

13 : E-UTRA-NR dual connectivity (see NOTE 6)

<**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 next reboot (this will happen also after inserting another SIM).

<**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.

NOTE 6: 3GPP TS 38.331 [160] specifies the information which, if present, indicates that the serving cell is supporting dual connectivity of E-UTRA with NR and is connected to an EPS core.

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>]

Preliminary Rev.0

Not Subject to NDA

Additional info:

- If the module is deregistered, <**format**>, <**oper**>, and <**AcT**> parameters are omitted and all of these parameters have the same type as set command except <**AcT**>.

Name	Type	Default	Description
<AcT>	integer	N/A	access technology selected
	Values: 0 : GSM 2 : UTRAN 3 : GSM w/EGPRS (see NOTE 1) 4 : UTRAN w/HSDPA (see NOTE 2) 5 : UTRAN w/HSUPA (see NOTE 2) 6 : UTRAN w/HSDPA and HSUPA (see NOTE 2) 7 : E-UTRAN 11 : NR connected to a 5GCN (see NOTE 5) 12 : NG-RAN 13 : E-UTRA-NR dual connectivity (see NOTE 6)		

NOTE 1: 3GPP TS 44.018 [156] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

NOTE 2: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

NOTE 5: 3GPP TS 38.331 [160] specifies the information which, if present, indicates that the serving cell is connected to a 5G CN. This value is not applicable in set command.

NOTE 6: 3GPP TS 38.331 [160] specifies the information which, if present, indicates that the serving cell is supporting dual connectivity of E-UTRA with NR and is connected to an EPS core.

Preliminary Rev.0

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.

<AcT> can be displayed 7(E-UTRAN) although module registered at E-UTRA-NR dual connectivity(13) because the master node is eNB and core is EPC for ENDC and it is Solution provider implementation.

Preliminary Rev.0

Not Subject to NDA

3.3.44. AT#ICMAUTOCONN - Set Datacall Auto connection mode

This command is intended to setup data call automatically to external internet through RNDIS or ECM when device boots up and get available system.

But user or network vender wants to use then will open it.

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

AT#ICMAUTOCONN=<pdn>,<auto_connect>

This command is intended to setup data call automatically to external internet through RNDIS or ECM when device boots up and get available system.

Parameters:

Name	Type	Default	Description
<pdn>	integer	N/A	PDN index Value: 1÷4 : disable auto connection
<auto_connect>	integer	N/A	Enable/Disable Auto connection Values: 0 : Disable Auto connection 1 : Enable Auto connection

Device does not try to connect when set to enable auto connection. It is applied after connect manually or next booting time.

Note: this command activates a context, so all necessary setup has to be done before it (registration, APN).

AT#ICMAUTOCONN?

Read command returns the session state in the following format:

Additional info:

Preliminary Rev.0

Not Subject to NDA

▶▶ # ICMAUTOCONN: <state>

...

OK

Name	Type	Default	Description
<pdn>	integer	N/A	PDN index
	Value:		
	1÷4 : PDN index		
<auto_connection>	integer	N/A	auto connection status
	Values:		
	0 : Disabled		
	1 : Enabled		

AT#ICMAUTOCONN=?

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

Preliminary Rev.0

Not Subject to NDA

3.3.45. AT#ENWCAUSE - EPS Network Cause

This command is related to EPS network cause.

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

AT#ENWCAUSE=[<emm>[,<esm>]]

Set command enables/disables URC of EMM/ESM cause.

Parameters:

Name	Type	Default	Description
<emm>	integer	0	URC of EMM
	Values:		
	0 : disables URC of EMM		
	1 : enables URC of EMM		
<esm>	integer	0	URC of ESM
	Values:		
	0 : disables URC of ESM		
	1 : enables URC of ESM		

<cause> is defined in TS24.301.

AT#ENWCAUSE?

Read command reports whether each URC of network cause is currently enabled or not. Display 3rd and 4th URC values of network cause when having a reject cause from network.

#ENWCAUSE: <emm>,<esm>,<emm_cause>,<esm_cause>

Preliminary Rev.0

Not Subject to NDA

Additional info:

▶▶

<emm_cause>

0	EMM no failure
2	IMSI Unknown In HSS
3	Illegal UE
5	IMEI not accepted
6	Illegal ME
7	EPS services not allowed
8	EPS services and non-EPS services not allowed
9	UE identity cannot be derived by NW
10	Implicitly detached
11	PLMN not allowed
12	Tracking Area not allowed
13	Roaming not allowed in this tracking area
14	EPS services not allowed in this PLMN
15	No Suitable Cells in tracking area
16	MSC temporarily not reachable
17	Network failure
18	CS domain not available
19	ESM failure
20	MAC failure
21	Synch failure
22	Congestion
23	UE security capabilities mismatch
24	Security mode rejected, unspecified
25	Not authorized for this CSG
26	Non-EPS authentication unacceptable
38	CS fallback call EST not allowed
39	CS service temporarily not available
40	No EPS bearer context activated
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with the protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with the protocol state
111	Protocol error, unspecified

<esm_cause>

0	ESM no failure
8	Operator Determined Barring
26	Insufficient resources
27	Missing or unknown APN
28	Unknown PDN type
29	User authentication failed
30	Request rejected by Serving GW or PDN GW
31	Request rejected, unspecified
32	Service option not supported
33	Requested service option not subscribed

Preliminary Rev.0

Not Subject to NDA

34 Service option temporarily out of order
35 PTI already in use
36 Regular deactivation
37 EPS QoS not accepted
38 Network failure
39 Reactivation requested
40 ESM feature not supported
41 Semantic error in the TFT operation
42 Syntactical error in the TFT operation
43 Invalid EPS bearer identity
44 Semantic errors in packet filter(s)
45 Syntactical errors in packet filter(s)
46 EPS bearer context without TFT already activated
47 PTI mismatch
49 Last PDN disconnection not allowed
50 PDN type IPv4 only allowed
51 PDN type IPv6 only allowed
52 Single address bearers only allowed
53 ESM information not received
54 ESM information not received
55 Multiple PDN connections for a given APN not allowed
56 Collision with network initiated request
59 Unsupported QCI value
81 Invalid PTI value
95 Semantically incorrect message
96 Invalid mandatory information
97 Message type non-existent or not implemented
98 Message type not compatible with the protocol state
99 Information element non-existent or not
100 Conditional IE error
111 Protocol error, unspecified
112 APN restriction value incompatible with active EPS bearer context

AT#ENWCAUSE=?

Test command returns supported values of parameters **<emm>** and **<esm>**

Preliminary Rev.0

Not Subject to NDA

3.3.46. 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

3GPP TS 24.501

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/5GMM) or session management (SM) 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 9.9.3.9.1 (for EMM cause) of 3GPP TS 24.301.
3. In 5G network the <code>s meanings are included in tables 9.11.3.2.1 (for 5GMM cause) of 3GPP TS 24.501.

Name	Type	Default	Description
<code>	integer	N/A	error code

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Not Subject to NDA

Values:

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
24	:	MBMS bearer capabilities insufficient for the service

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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

45 : syntactical err in PKT filter

46 : PDP context without TFT activated

47 : multicast group membership timeout

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Not Subject to NDA

48	:	retry on new cell begin (if MM cause failure) / activation rejected BCM violation (if SM cause failure)
50	:	PDP type IPV4 only allowed
51	:	PDP type IPV6 only allowed
52	:	single address bearers only allowed
63	:	retry on new cell end
81	:	invalid transaction identifier
95	:	semantically incorrect message
96	:	invalid mandatory information
97	:	MSG type non-existent or not implemented
98	:	MSG type not compatible with protocol state
99	:	IE non-existent or not implemented
100	:	conditional IE error
101	:	MSG not compatible with protocol state
111	:	protocol error unspecified
112	:	APN restriction value incompatible with active PDP context

AT#CEERNET=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

3.4. Phonebook

3.4.1. 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)

"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)

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"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?

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**>.

Preliminary Rev.0

Not Subject to NDA

Current phonebook storage is SIM.

```
AT+CPBS="SM"
OK
AT+CPBR=1
+CPBR: 1,"0105872928",129,"James"
OK
```

Preliminary Rev.0

Not Subject to NDA

3.4.2. 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>[,<group>][,<adnumber>][,<adtype>][,<secondtext>][,<email>]]

...

[<CR><LF>+CPBR:<index2>,<number>,<type>,<text>[,<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:

response parameters

Name	Type	Default	Description
<indexn>	integer	-	the location numbers of phonebook memory

Preliminary Rev.0

Not Subject to NDA

<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	-	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
<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>

Preliminary Rev.0

Not Subject to NDA

Additional info:

▶▶ response parameters

Name	Type	Default	Description
<minIndex>	integer	-	the minimum <**index**> number
<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.

Preliminary Rev.0

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
```

Preliminary Rev.0

Not Subject to NDA

3.4.3. 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>[,<group>][,<adnumber>]
[,<adtype>][,<secondtext>][,<email>]<CR><LF>

+CPBF:<index2>,<number>,<type>,<text>[,<group>][,<adnumber>]
[,<adtype>][,<secondtext>][,<email>][...]]]

Name	Type	Default	Description
<indexn>	integer	-	the location number of the phonebook entry
<number>	string	-	phone number of format <**type**>
<type>	integer Values:	N/A	type of address octet

Preliminary Rev.0

Not Subject to NDA

		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**

+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

Preliminary Rev.0

Not Subject to NDA

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**>

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.

Preliminary Rev.0

Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.4.4. 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>]]]]]]]]

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 command select TE character set **+CSCS**
<adnumber>	string	-	an additional number of format <**adtype**>
<adtype>	integer	-	type of address octet

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Not Subject to NDA

<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**

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.

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"

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	-	the maximum length of field <**number**>
<tlength>	integer	-	the maximum length of field <**text**>

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<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.

```
AT+CPBW=?
+CPBW: (1-100),40,(129, 145),255
OK
AT+CPBW=6,"18651896699",129,"John"
OK
```

Preliminary Rev.0

Not Subject to NDA

3.4.5. 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

Name	Type	Default	Description
<indexLast>	integer	NA	last 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

Additional info:

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Not Subject to NDA

▶▶ 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
<maxIndex>	integer	-	maximum <**index**> number
<tlength>	integer	-	maximum <**text**> field length

Preliminary Rev.0

Not Subject to NDA

3.4.6. 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:

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**)

Preliminary Rev.0

Not Subject to NDA

3.4.7. 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>**.

Preliminary Rev.0

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
```

Preliminary Rev.0

Not Subject to NDA

3.5. SMS & CB

3.5.1. 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

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

Preliminary Rev.0

Not Subject to NDA

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.

AT+CSMS?

Read command reports current service setting along with supported message types in the format:

+CSMS: <service>, <mt>, <mo>, <bm>

Preliminary Rev.0

Not Subject to NDA

AT+CSMS=?

Test command reports the supported value of the parameter <**service**>.

Preliminary Rev.0

Not Subject to NDA

3.5.2. 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 Note: "ME" will be set as default if SIM storage is not supported
			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)
<memw>	string	SM	memory to which writing and sending operations are made Note: "ME" will be set as default if SIM storage is not supported

Preliminary Rev.0

Not Subject to NDA

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 Note: "ME" will be set as default if SIM storage is not supported

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

"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>

Not Subject to NDA

Preliminary Rev.0

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

Preliminary Rev.0

Not Subject to NDA

3.5.3. 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>**.

Preliminary Rev.0

Not Subject to NDA

3.5.4. 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:

+CSCA: <number>,<type>

If SCA is not present the device reports an error message.

Preliminary Rev.0

Not Subject to NDA

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
```

Preliminary Rev.0

Not Subject to NDA

3.5.5. 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: 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:

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Not Subject to NDA

	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**.

<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=?

Preliminary Rev.0

Not Subject to NDA

Test command returns the OK result code.

- 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

Preliminary Rev.0

Not Subject to NDA

3.5.6. 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>**

AT+CSDH?

Read command reports the current setting in the format:

Preliminary Rev.0

Not Subject to NDA

+CSDH: <show>

AT+CSDH=?

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

Preliminary Rev.0

Not Subject to NDA

3.5.7. 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 ("").

The current settings are stored also by **+CSAS** command

AT+CSCB?

Not Subject to NDA

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
```

Preliminary Rev.0

Not Subject to NDA

3.5.8. 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=?

Test command returns the possible range of values for the parameter <**profile**>.

Preliminary Rev.0

Not Subject to NDA

3.5.9. 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.

AT+CRES=?

Test command returns the possible range of values for the parameter **<profile>**.

Preliminary Rev.0

Not Subject to NDA

3.5.10. 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)

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

AT+CMMS?

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

Preliminary Rev.0

Not Subject to NDA

+CMMS: <n>

AT+CMMS=?

Test command returns the range of supported **<n>**.

Preliminary Rev.0

Not Subject to NDA

3.5.11. 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 27.005

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

Values:

0 : GPRS

1 : circuit switched

2 : GPRS preferred. Use circuit switched if SMS via GPRS service not available or GPRS not registered.

3 : circuit switched preferred. Use GPRS if SMS via circuit switched not available.

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

AT+CGSMS?

The read command returns the currently selected service or service preference in the format:

+CGSMS: <service>

Preliminary Rev.0

Not Subject to NDA

AT+CGSMS=?

Test command reports the supported list of currently available <**service**>.

The <**service**> value is saved on NVM as global parameter.

Preliminary Rev.0

Not Subject to NDA

3.5.12. 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.

<mt>	integer	0	result code indication reporting for SMS-DELIVER.

Values:

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Not Subject to NDA

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.

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)

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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.

  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

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Not Subject to NDA

+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 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**)

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Not Subject to NDA

<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
<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

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Not Subject to NDA

<data>	string	CBM Content of Message * 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:

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

AT+CNMI=?

Test command reports the supported range of values for the +CNMI command parameters

Preliminary Rev.0

Not Subject to NDA

```
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
```

Preliminary Rev.0

Not Subject to NDA

3.5.13. 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
<stat>	integer	N/A	status value Values: 0 : new message

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Not Subject to NDA

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:

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

Preliminary Rev.0

Not Subject to NDA

"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.
<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

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Not Subject to NDA

<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.

▶▶ 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

Preliminary Rev.0

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.

Preliminary Rev.0

Not Subject to NDA

3.5.14. 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>

Name	Type	Default	Description
<stat>	integer	N/A	status of the message

Preliminary Rev.0

Not Subject to NDA

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>

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

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	"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
<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**.

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<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 "+")
<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.

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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

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Not Subject to NDA

3.5.15. 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

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.

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Not Subject to NDA

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.

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.

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Not Subject to NDA

In case that a directly routed message must be buffered in ME/TA (possible when **+CNMI** parameter <**mode**> equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (e.g. user is entering a message using **+CMGS**), acknowledgement (RP-ACK) is sent to the network without waiting **+CNMA** command from TE.

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- PDU Mode

AT+CSMS=1
+CSMS: 1,1,1
OK

Set PDU mode.
AT+CMGF=0
OK

AT+CNMI=2,2,0,0,0
OK

Message is received from network.
+CMT: "",70
0681600058542600048098060 0F170110370537284...

Send positive acknowledgement to the network.
AT+CNMA=0
OK

Message is received from network.
+CMT: "",70
0681600058542600048098060 0F170110370537284...

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

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

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Not Subject to NDA

3.5.16. 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.

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

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Not Subject to NDA

<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.

- 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

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Not Subject to NDA

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.

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.

Preliminary Rev.0

Not Subject to NDA

To avoid malfunctions it is suggested to wait for the **+CMGS: <mr>** or **+CMS ERROR: <err>** response before issuing further commands.

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
```

Preliminary Rev.0

Not Subject to NDA

3.5.17. 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 (3GPP format). Values: 129 : number in national format 145 : number in international format (contains the "+")

Additional info:

If message is successfully sent to the network, then the result is sent in the format:

+CMSS: <mr>

Name	Type	Default	Description

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Not Subject to NDA

<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.

Send a 3GPP format SMS can be aborted.

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.

Preliminary Rev.0

Not Subject to NDA

3.5.18. 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.

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

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Not Subject to NDA

<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:

<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..

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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)

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. 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

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Not Subject to NDA

<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.

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.

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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
```

Preliminary Rev.0

Not Subject to NDA

3.5.19. 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

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.

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Not Subject to NDA

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
```

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Not Subject to NDA

3.5.20. 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 outgoing SMS either over CPS or over IMS (IP Multimedia Core Network Subsystem).

Parameter:

Name	Type	Default	Description
<mode>	integer	1	mode to invoke SMS service

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

AT#ISMSCFG?

Read command returns the current domain selected to route the outgoing SMS in the format:

#ISMSCFG: <mode>

AT#ISMSCFG=?

Test command returns the supported range of values for parameter <**mode**>, in the format:

#ISMSCFG: (list of supported **<mode>**s)

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Not Subject to NDA

3.5.21. AT+C5GSMS - 5GS access selection preference for MO SMS

5GS access selection preference for MO SMS

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

AT+C5GSMS=[<access_pref>]

The set command is used to specify the access preference that the MT will use to send MO SMS over NAS messages in 5GS.

Parameter:

Name	Type	Default	Description
<access_pref>	integer	0	indicates the access preference to use to send MO SMS over NAS messages. Values: 0 : 3GPP access preferred, non-3GPP access is used if 3GPP access is not available 1 : non-3GPP access preferred, 3GPP access is used if non-3GPP access is not available

AT+C5GSMS?

The read command returns the currently selected access preference.

+C5GSMS: <access_pref>

AT+C5GSMS=?

The test command returns the supported access preferences as a compound value.

This command is supported only in **5G NR** mode. In other modes, **ERROR** is returned.

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Not Subject to NDA

3.5.22. AT+C5GUSMS - 5GS use of SMS over NAS

5GS use of SMS over NAS

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

AT+C5GUSMS=[<n>[,<sms_requested>]]

The set command enables the UE to request the use of SMS over NAS in 5GS or to request stopping the use of SMS over NAS in 5GS

Parameters:

Name	Type	Default	Description
<n>	integer	0	enable/disable unsolicited result code.
	Values:		
	0 : no change in current setting of <n>		
	1 : disable unsolicited result code +C5GUSMS: <sms_available>,<sms_allowed>		
	2 : enable unsolicited result code +C5GUSMS: <sms_available>,<sms_allowed>		
<sms_requested>	integer	0	indicates the UE's request for SMS over NAS in 5GS.
	Values:		
	0 : triggers the UE to request the use of SMS over NAS in 5GS		
	1 : triggers the UE to request stopping the use of SMS over NAS in 5GS		

Additional info:

- The set command controls the presentation of the unsolicited result code **+C5GUSMS: <sms_available>,<sms_allowed>** when **<n>=2** and SMS over NAS in 5GS allowed status

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information or SMS over NAS in 5GS availability status information is received from the network, for the UE (see 3GPP TS 24.501 [161] subclauses 5.4.4.3, 5.5.1.2.4 and 5.5.1.3.4).

AT+C5GUSMS?

The read command returns the current SMS over NAS in 5GS availability status for the UE and the current SMS over NAS in 5GS allowed status for the UE.

Additional info:

+C5GUSMS: <sms_available>,<sms_allowed>

Name	Type	Default	Description
<sms_available>	integer	N/A	indicates the current SMS over NAS in 5GS availability status for the UE in the network

Values:

0 : indicates that the SMS over NAS in 5GS availability status for the UE is unknown

1 : indicates that SMS over NAS in 5GS is not available in the network for the UE (see 3GPP TS 24.501 [161] subclause 5.4.4.3)

2 : indicates that SMS over NAS in 5GS is available in the network for the UE (see 3GPP TS 24.501 [161] subclause 5.4.4.3)

<sms_allowed>	integer	N/A	indicates the current SMS over NAS in 5GS allowed status for UE in the network.

Values:

0 : indicates that SMS over NAS in 5GS allowed status for the UE is unknown

1 : indicates that the UE is not allowed by the network to use SMS over NAS in 5GS (see

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3GPP TS 24.501 [161] subclauses 5.4.4.3, 5.5.1.2.4 and 5.5.1.3.4)

2 : indicates that the UE is allowed by the network to use SMS over NAS in 5GS (see 3GPP TS 24.501 [161] subclauses 5.5.1.2.4 and 5.5.1.3.4)

AT+C5GUSMS=?

The test command returns the values supported as compound values.

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Not Subject to NDA

3.6. Time & Alarm

3.6.1. 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

ss : seconds (two digits are mandatory), range is 00..59

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Not Subject to NDA

±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

Preliminary Rev.0

Not Subject to NDA

3.6.2. AT#UPTIME - System Up Time

This command returns elapsed time from system up.

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

AT#UPTIME=<format>

This command returns elapsed time from system up according to format setting.

Parameter:

Name	Type	Default	Description
<format>	integer	N/A	time format Values: 0 : sec unit 1 : time unit

AT#UPTIME=?

Test command return all support value of the parameters **<format>**.

Preliminary Rev.0

Not Subject to NDA

3.6.3. 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		
<auxmode>	integer	1	TE-TA interface data format.
	Values:		
	1 : yy/MM/dd		

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Not Subject to NDA

2 : yyyy/MM/dd

The **<time>** format of **+CCLK** and **+CALA** is:

5. "yy/MM/dd,hh:mm:ss+zz" when **<auxmode>**=1
6. "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>**.

Preliminary Rev.0

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

Preliminary Rev.0

Not Subject to NDA

3.6.4. 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=<reporting>

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:

<reporting> : 1
+CTZV: <tz>

<reporting> : 2
+CTZV: <tz>,<dst>,[<time>]

Parameter:

Name	Type	Default	Description
<reporting>	integer	0	enable/disable the time zone change event reporting. Values: 0 : Disable time zone change event reporting 1 : Enable time zone change event reporting 2 : Enable extended time zone change event reporting

Unsolicited fields:

Name	Type	Description
<tz>	string	New time zone.
<dst>	integer	Daylight Saving Time Values:

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Not Subject to NDA

		0 : <tz> includes no adjustment for Daylight Saving Time 1 : <tz> includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight saving time 2 : <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time
<time>	string	string type value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss". This parameter can be provided by the network.

AT+CTZR?

Read command reports the currently selected **<reporting>** in the format:

+CTZR: <reporting>

AT+CTZR=?

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

Preliminary Rev.0

Not Subject to NDA

3.6.5. 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.

AT+CTZU?

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

+CTZU: <onoff>

Preliminary Rev.0

Not Subject to NDA

AT+CTZU=?

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

Preliminary Rev.0

Not Subject to NDA

3.6.6. 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>]

This command sets the time format of the time information presented to the user, which is specified by use of the **<mode>** parameter. The **<mode>** affects the time format on the phone display and doesn't affect the time format of the AT command serial interface, so it not actually not used.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	phone display time format Values: 1 : [hh]:[mm] (24 hour clock) 2 : [hh]:[mm] (a.m./p.m.)

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

AT+CSTF?

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

+CSTF: <**mode**>.

AT+CSTF=?

Preliminary Rev.0

Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.6.7. 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
<mode>	integer	0	enables/disables the **#NITZ** URC Values: 0 : disables the URC 1 : enables the URC

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Not Subject to NDA

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:ssÂ±zz"** - *'extended'* format, if <**val**> is in (4..7) **"yy/MM/dd,hh:mm:ssÂ±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:ssÂ±zz"**.

Date and time information can be sent by the network after GSM registration or after PS attach.

AT#NITZ?

Read command reports whether

automatic date/time updating

Full Network Name applying

#NITZ URC (as well as its format)

are currently enabled or not in the format:

#NITZ: <val>,<mode>

AT#NITZ=?

Test command returns supported values of parameters <**val**> and <**mode**>.

Preliminary Rev.0

Not Subject to NDA

3.7. Packet Domain

3.7.1. 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>

Preliminary Rev.0

Not Subject to NDA

AT+CGCLASS=?

Test command reports the range for the parameter <**class**>.

Preliminary Rev.0

Not Subject to NDA

3.7.2. 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
	Value:		
	0÷max	:	use test command to know the values range
<peak>	integer	0	peak throughput class
	Value:		

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Not Subject to NDA

	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.

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

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Not Subject to NDA

<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
```

Preliminary Rev.0

Not Subject to NDA

3.7.3. 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_address>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<emergencyInd>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>[,<SSC_mode>[,<S-NSSAI>[,<Pref_access_type>[,<RQoS_ind>[,<MH6-PDU>[,<Always-on_req>]]]

	"IPV6" : Internet Protocol version 6 "IPV4V6" : Virtual introduced to handle dual IP stack UE capability.		
<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.
<d_comp>	integer	0	Numeric parameter that controls PDP data compression. Values: 0 : compression off 1 : compression on 2 : V.42bis 3 : V.44
<h_comp>	integer	0	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. Values: 0 : IPv4 Address Allocation through NAS Signaling

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Not Subject to NDA

			1 : IPv4 Address Allocated through DHCP
<emergencyInd>	integer	0	a numeric parameter used to indicate whether the PDP context is for emergency bearer services or not. Values: 0 : PDP context is not for emergency bearer services (default) 1 : PDP context is for emergency bearer services
<P-CSCF_discovery>	integer	0	a numeric parameter influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L. Values: 0 : Preference of P-CSCF address discovery not influenced by +CGDCONT 1 : Preference of P-CSCF address discovery through NAS Signalling
<IM_CN_Signalling_Flag_Ind>	integer	0	a numeric parameter used to indicate to the network whether the PDP context is for IM CN subsystem-related signalling only or not. Values: 0 : UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 : UE indicates that the PDP context is for IM CN subsystem-related signalling only
<NSLPI>	integer	0	indicates the NAS signalling priority requested for this PDP context

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Values:

0 : indicates that this PDP context is to be activated with the value for the low priority indicator configured in the MT.

1 : indicates that this PDP context is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signalling low priority".

<securePCO>	integer	0	Specifies if security protected transmission of PCO is requested or not (applicable for EPS only)

Values:

0 : Security protected transmission of PCO is not requested

1 : Security protected transmission of PCO is requested

<IPv4_MTU_discovery>	integer	0	influences how the MT/TA requests to get the IPv4 MTU size

Values:

0 : Preference of IPv4 MTU size discovery not influenced by +CGDCONT

1 : Preference of IPv4 MTU size discovery through NAS signalling

<Local_Addr_Ind>	integer	0	indicates to the network whether or not the MS supports local IP address in TFTs

Values:

0 : indicates that the MS does not support local IP address in TFTs

1 : indicates that the MS supports local IP address in TFTs

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<Non-IP_MTU_discovery>	integer	0	influences how the MT/TA requests to get the Non-IP MTU size Values: 0 : Preference of Non-IP MTU size discovery not influenced by +CGDCONT 1 : Preference of Non-IP MTU size discovery through NAS signalling
<Reliable_Data_Service>	integer	0	indicates whether the UE is using Reliable Data Service for a PDN connection or not Values: 0 : Reliable Data Service is not being used for the PDN connection 1 : Reliable Data Service is being used for the PDN connection
<SSC_mode>	integer	0	indicates the session and service continuity (SSC) mode for the PDU session in 5GS Values: 0 : indicates that the PDU session is associated with SSC mode 1 1 : indicates that the PDU session is associated with SSC mode 2
<S-NSSAI>	string	-	hexadecimal character format. Dependent of the form, the string can be separated by dot(s) and semicolon(s). The S-NSSAI is associated with the PDU session for identifying a network slice in 5GS. sst: only slice/service type (SST) is present sst;mapped_sst: SST and mapped configured SST are present sst.sd: SST and slice

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			differentiator (SD) are present sst.sd;mapped_sst: SST, SD and mapped configured SST are present sst.sd;mapped_sst.mapped_sd: SST, SD, mapped configured SST and mapped configured SD are present
<Pref_access_type>	integer	0	indicates the preferred access type for the PDU session in 5GS Values: 0 : indicates that the preferred access type is 3GPP access 1 : indicates that the preferred access type is non-3GPP access
<RQoS_ind>	integer	0	indicates whether the UE supports reflective QoS for the PDU session Values: 0 : indicates that reflective QoS is not supported for the PDU session 1 : indicates that reflective QoS is supported for the PDU session
<MH6-PDU>	integer	0	indicates whether the UE supports IPv6 multi-homing for the PDU session Values: 0 : indicates that IPv6 multi-homing is not supported for the PDU session 1 : indicates that IPv6 multi-homing is supported for the PDU session
<Always-on_req>	integer	0	cates whether the UE requests to establish the PDU session as an always-on PDU session Values:

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0 : always-on PDU session is not requested

1 : always-on PDU session is requested

a special form of the Set command, +CGDCONT=<cid>, causes the values for context number <cid> to become undefined.

but if <cid> is already configured as default attach profile or embedded profile or tethered profile, it will be re-defined automatically with default values.

Only IP, IPV6 and IPV4V6 values are supported for EPS(LTE) services.

For EPS(LTE) <PDP_addr> is omitted.

if <emergencyInd> is enabled, this profile can not be used attached profile.

The following parameters are supported to input some value. Other parameters that not supported should be NULL value.

<cid>, <PDP_type>, <APN>, <PDP_address>, <d_comp>, <h_comp>, <IPv4AddrAlloc>, <emergencyInd>, <SSC_mode>, <S-NSSAI>, <Always-on_req>

Ex) <SSC_mode>

AT+CGDCONT=42,"IP","test","",0,0,0,1,,,,,,,,,**0**

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>[,<emergencyInd>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>[,<SSC_mode>[,<S-NSSAI>[,<Pref_access_type>[,<RQoS_ind>[,<MH6-PDU>[,<Always-on_req>]]]]]]]]]]]]]]]][<CR><LF>

+CGDCONT:
<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<emergencyInd>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>[,<SSC_mode>[,<S-NSSAI>[,<Pref_access_type>[,<RQoS_ind>[,<MH6-PDU>[,<Always-on_req>]]]]]]]]]]]]]]]][<CR><LF>

Preliminary Rev.0

Not Subject to NDA

AT+CGDCONT=?

Test command returns values supported as a compound value.

```
AT+CGDCONT=1,"IP","APN","10.10.10.10",0,0,0,0,0.0
OK

AT+CGDCONT?
+CGDCONT: 1,"IP","APN","10.10.10.10",0,0,0,0,,,,,,,,,"",,,,0

OK
```

Preliminary Rev.0

Not Subject to NDA

3.7.4. 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.

Additional info:

▶▶ List of the meaning of the response message parameters.

Name	Type	Default	Description

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Not Subject to NDA

<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:

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.

Preliminary Rev.0

Not Subject to NDA

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.

```
AT+CGACT=1,1
OK

AT+CGCONTRDP=?
+CGCONTRDP: (1)

OK

AT+CGCONTRDP =1
+CGCONTRDP: 1,5,lte.ktfwing.com,"10.52.202.76",,"211.219.86.1","168.126.63.1"

OK
```

Preliminary Rev.0

Not Subject to NDA

3.7.5. 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
	Value:		
	0÷max	:	use test command to know the values range
<peak>	integer	0	peak throughput class
	Value:		

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	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=?

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.

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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.

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Not Subject to NDA

3.7.6. 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.

- 3GPP TS 27.007

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

AT+CGEQREQ[<cid>[,<trafficClass>[,<maxBitRateUL>[,<maxBitRateDL>[,<guarBitRateUL> [,<guarBitRateDL>[,<deliverOrder>[,<maxSDUsize>[,<SDUerrRatio> [,<resBitErrRatio>[,<delErrSDUs>[,<tranDelay>[,<traffHandPrio> [,<sourStatiDesc>[,<signInd>]]]]]]]]]]]]]]

The set command allows to specify a 3G quality of service profile for the context identified by the(local) context identification parameter <**cid**> which is used when the MT sends an Activate PDP Context Request message to the network.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see **+CGDCONT** command).
<trafficClass>	integer	4	traffic class Values: 0 : conversational 1 : streaming 2 : interactive 3 : background 4 : subscribed value
<maxBitRateUL>	integer	0	maximum bitrate up link (kbits/s). This parameter should be provided if the

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			<**trafficClass**> is specified as conversational or streaming. Values: 0 : subscribed value 1÷568 : kbits/s 576÷11520 : kbits/s
<**maxBitRateDL**>	integer	0	maximum bitrate down link (kbits/s). This parameter should be provided if the <**trafficClass**> is specified as conversational or streaming. Values: 0 : subscribed value 1÷568 : kbits/s 576÷8640 : kbits/s 8700÷42200 : kbits/s
<**guarBitRateUL**>	integer	0	guaranteed bitrate up link(kbits/s). This parameter should be provided if the <**trafficClass**> is specified as conversational or streaming. Values: 0 : subscribed value 1÷568 : kbits/s 576÷8640 : kbits/s 8700÷42200 : kbits/s
<**guarBitRateDL**>	integer	0	guaranteed bitrate down link(kbits/s). This parameter should be provided if the <**trafficClass**> is specified as conversational or streaming. Values: 0 : subscribed value 1÷568 : kbits/s

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576÷8640 : kbits/s

8700÷42200 : kbits/s

<deliverOrder>	integer	2	SDU delivery order Values: 0 : disable 1 : enable 2 : subscribed value
<maxSDUsize>	integer	0	maximum SDU size in octets Values: 0 : subscribed value 10÷1500 : size in octets 1502 : size in octets 1510 : size in octets 1520 : size in octets
<SDUerrRatio>	string	0E0	SDU error ratio mEe means m*10-e, e.g 1E2 means 1*10-2 Values: 0E0 : 0*10-0 1E1 : 1*10-1 1E2 : 1*10-2 7E3 : 7*10-3 1E3 : 1*10-3 1E4 : 1*10-4 1E5 : 1*10-5

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	1E6 : 1*10-6		
<resBitErrRatio>	string	0E0	residual bitt error ratio mEe means m*10-e, e.g. 1E2 mean 1*10-2 Values: 0E0 : 0*10-0 5E2 : 5*10-2 1E2 : 1*10-2 5E3 : 5*10-3 4E3 : 4*10-3 1E3 : 1*10-3 1E4 : 1*10-4 1E5 : 1*10-5 1E6 : 1*10-6 6E8 : 6*10-8
<delErrSDUs>	integer	3	delivery of erroneous SDUs Values: 0 : disable 1 : enable 2 : no detect 3 : subscribed value
<tranDelay>	integer	0	transfer delay (milliseconds) Values: 0 : subscribed value 10÷150 : delay (milliseconds)

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	200÷950 : delay (milliseconds) 1000÷4000 : delay (milliseconds)		
<traffHandPrio>	integer	0	traffic handling priority Values: 0 : subscribed value 1÷3 : priority level
<sourStatiDesc>	integer	0	characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the <**trafficClass**> is specified as conversational or streaming Values: 0 : characteristics of SDUs is unknown 1 : characteristics of SDUs corresponds to a speech source
<signInd>	integer	0	signalling content of submitted SDUs for a PDP context. This parameter should be provided if the <**trafficClass**> is specified as interactive. Values: 0 : PDP context is not optimized for signalling 1 : PDP context is optimized for signalling <PDP_type> (see +CGDCONT command)

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

The set command can modify the 2G QoS according to standard [2], see +CGQREQ command.

AT+CGEQREQ?

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

[+CGEQREQ: <cid>,<trafficClass>,<maximumBitrateUl>,
<maximumBitrateDl>,<guaranteedBitrateUl>,<guaranteedBitrateDl>,

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<deliveryOrder>,<maximumSduSize>,<sduErrorRatio>,
<residualBitErrorRatio>,<deliveryErroneousSdus>,<transferDelay>,
<trafficHandlingPriority>,<sourceStatisticsDescriptor>,
<signallingIndication><CR><LF>]

If no PDP context has been defined it has no effect, and **OK** result code is returned.

AT+CGEQREQ=?

Test command returns as a compound value the type of the current PDP context and the supported values for the sub-parameters in the format:

+CGQEQREQ: <pdpType>,
(list of supported <trafficClass>s),
(list of supported <maximumBitrateUl>s),
(list of supported <maximumBitrateDl>s),
(list of supported <guaranteedBitrateUl>s),
(list of supported <guaranteedBitrateDl>s),
(list of supported <deliveryOrder>s),
(list of supported <maximumSduSize>s),
(list of supported <sduErrorRatio>s),
(list of supported <residualBitErrorRatio>s),
(list of supported <deliveryErroneousSdus>s),
(list of supported <transferDelay>s),
(list of supported <trafficHandlingPriority>s),
(list of supported <sourceStatisticsDescriptor>s),
(list of supported <signallingIndication>s)

Additional info:

▶▶ PDP type

Name	Type	Default	Description
<pdpType>	string	-	specifies the type of packet data protocol (see **+CGDCONT** command)

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Not Subject to NDA

3.7.7. 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)

AT+CGEQNEG=?

Test command returns a list of **<cid>**s associated with active contexts.

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Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.7.8. 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 PDP. The address may be static or dynamic: 7. for a static address, it will be the one set by the **+CGDCONT** command when the context was defined

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8.	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.

```
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
```

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Not Subject to NDA

3.7.9. 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)

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Not Subject to NDA

3.7.10. 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 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].

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<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)

Preliminary Rev.0

Not Subject to NDA

3.7.11. 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**. Values: 0 : both IP address, and subnet mask are started explicitly, separated by a space.

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			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.

AT+CGPIAF=?

Test command returns values supported as compound values.

Preliminary Rev.0

Not Subject to NDA

```
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
```

Preliminary Rev.0

Not Subject to NDA

3.7.12. 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.

<bfr>	integer	0	controls the effect on buffered codes when **<mode>** 1 or 2 is entered.

Values:

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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>]

- 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.

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Not Subject to NDA

+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:

+CGEREP: <mode>,<bfr>

AT+CGEREP=?

Test command reports the supported range of values for the **+CGEREP** command parameters.

Preliminary Rev.0

Not Subject to NDA

3.7.13. 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 Values: 0 : detached 1 : attached	N/A	state of PS attachment

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.

Preliminary Rev.0

Not Subject to NDA

```
AT+CGATT?
+CGATT: 0
OK

AT+CGATT=?
+CGATT: (0,1)
OK

AT+CGATT=1
OK
```

Preliminary Rev.0

Not Subject to NDA

3.7.14. 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

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

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Not Subject to NDA

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.
<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.

Preliminary Rev.0

Not Subject to NDA

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.

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].

Preliminary Rev.0

Not Subject to NDA

3.7.15. 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:**

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.

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<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.

Preliminary Rev.0

Not Subject to NDA

3.7.16. 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
<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.

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Not Subject to NDA

Name	Type	Default	Description
<packet filter identifier>	integer	N/A	packet filter identifier Value: 1÷16 : supported range
<evaluation precedence index>	integer	N/A	evaluation precedence index Value: 0÷255 : supported range
<source address and subnet mask>	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** "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"

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<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 mask>	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"
<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

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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].

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].

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Not Subject to NDA

3.7.17. 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:

+CGACT: <cid>,<state>[<CR><LF>
+CGACT: <cid>,<state>[...]]

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Not Subject to NDA

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
```

Preliminary Rev.0

Not Subject to NDA

3.7.18. 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>[,<IM_CN_Signalling_Flag_Ind>]]]]

Set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context Identification parameter, **<cid>**.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP Context Identifier, see **+CGDCONT** command.
<p_cid>	integer	-	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.
<d_comp>	integer	0	controls PDP data compression (applicable for SNDCPonly) (refer 3GPP TS 44.065 [61]) Values: 0 : off (default if value is omitted) 1 : on (manufacturer preferred compression) 2 : V.42 bis

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	3 : V.44		
<h_comp>	integer	0	controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]). Values: 0 : off (default if value is omitted) 1 : on (manufacturer preferred compression) 2 : RFC1144 (applicable for SNDCP only) 3 : RFC2507 4 : RFC3095 (applicable for PDCP only)
<IM_CN_Signalling_Flag_Ind>	integer	N/A	indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not. Values: 0 : UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 : UE indicates that the PDP context is for IM CN subsystem-related signalling only

AT+CGDSCONT?

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

+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind>[<CR><LF>
+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind> [...]]

AT+CGDSCONT=?

Test command returns the supported range of values of parameters.

Preliminary Rev.0

Not Subject to NDA

Preliminary Rev.0

Not Subject to NDA

3.7.19. 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 **+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=?

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Not Subject to NDA

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.

Preliminary Rev.0

Not Subject to NDA

3.7.20. 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.

Values:

0 : disable the network registration unsolicited result code

1 : enable the network registration unsolicited result code, and selects the short format

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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 2 : UTRAN 3 : GSM w/EGPRS (see NOTE 3) 4 : UTRAN w/HSDPA (see NOTE 4) 5 : UTRAN w/HSUPA (see NOTE 4) 6 : UTRAN w/HSDPA and HSUPA (see NOTE 4) 7 : E-UTRAN

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Not Subject to NDA

<rac>	string	routing area code (one byte) in hexadecimal format

<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.

NOTE 3: 3GPP TS 44.018 [156] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

NOTE 4: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

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**>.

Preliminary Rev.0

Not Subject to NDA

3.8. SIM

3.8.1. 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:

Parameters:

Name	Type	Default	Description

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Not Subject to NDA

<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)
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

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Not Subject to NDA

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.

```
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
```

Preliminary Rev.0

Not Subject to NDA

3.8.2. 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
<code>	string	-	type of PIN
<retries>	integer	-	number of remaining retries per PIN
<default_retries>	integer	-	number of default/initial retries per PIN

Preliminary Rev.0

Not Subject to NDA

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
```

Preliminary Rev.0

Not Subject to NDA

3.8.3. 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

Preliminary Rev.0

Not Subject to NDA

3.8.4. 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
```

Preliminary Rev.0

Not Subject to NDA

3.8.5. 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		
	178 : READ RECORD		
	192 : GET RESPONSE		
	214 : UPDATE BINARY		
	220 : UPDATE RECORD		

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Not Subject to NDA

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).
<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)

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Not Subject to NDA

<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.

Use only decimal numbers for parameters <**command**>, <**fileid**>, <**P1**>, <**P2**> and <**P3**>.

AT+CRSM=?

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

Preliminary Rev.0

Not Subject to NDA

Read binary, ICCID(2FE2)

```
AT+CRSM=176,12258,0,0,10
+CRSM: 144,0,98285070200l107686F4
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=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFF
+CRSM: 144,0
OK
```

Status, FPLMN(6F7B)

```
AT+CRSM=242,28539
+CRSM:144,0,623C820238218410A0000000871002FFFFFFFF89040300FFA51180013181030
10A3282011E8304000030E08A01058B032F0609C6099001C0830101830181
OK
```

Get Response, MSISDN(6F40)

```
AT+CRSM=192,28480
+CRSM: 144,0,621E820542210026028302 6F40A5039201008A01058B036F06058002004C8800
OK
```

Preliminary Rev.0

Not Subject to NDA

3.8.6. AT+CSIM - Generic SIM Access

This command sends a generic command to the UICC.

3GPP TS 11.11/51.011

3GPP TS 27.007

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. In the same manner, the SIM <**response**> shall be sent back by the MT 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	-	length of the characters that are sent to SIM in <**command**> (two times the actual length of the command)
<command>	string	-	command passed on by the MT to the SIM in hexadecimal character format

Additional info:

List of the meaning of the response messages parameters.

Name	Type	Default	Description

Preliminary Rev.0

Not Subject to NDA

<length>	integer	-	length of the characters that are sent to TE in <**response**> (two times the actual length of the response)
<response>	string	-	response to the command passed on by the SIM to the MT in hexadecimal character format
<err>	string	-	error values (numeric format followed by verbose format)

AT+CSIM=?

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

AT+CSIM=<lock>

This command is used to lock to a direct control of the SIM by a distant application on the TE.

Parameters:

<lock>

1 - locking of the interface

0 - unlocking of the interface

Preliminary Rev.0

Not Subject to NDA

STATUS

AT+CSIM=10,"A0F2000016"

+CME ERROR: operation not supported

STATUS

AT+CSIM=10,"80F2000000"

+CSIM:134,"623F8202782183027FF08410A0000000871002FFFFFFFF89060400FFA50780017183028482 8A01058B032F0602C6129001788301018301 0A83010B83010E8301819000"

OK

SELECT EF 6F07 No Data Returned

AT+CSIM=18,"00A4080C047F206F07"

+CSIM: 4,"9000"

OK

SELECT EF 6F30 Return FCP Template

AT+CSIM=18,"00A40804047F206F30"

+CSIM:68,"621E8202412183026F30A506C00140DE01008A01058B036F06048002006988009000"

OK

READ BINARY

AT+CSIM=10,"00B0000069"

+CSIM:214,"02F81012F47022F83082F63082F64022F60192F31412F60313006132F40102F20162F21032F2300 2F60182F41012F91042F41902F46102F40242F22092F52072F22062F03062F86032F01032F11042F01032F802 17F60127F42027F43027F44027F24337F62037F0209000"

OK

Preliminary Rev.0

Not Subject to NDA

3.8.7. 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

Additional info:

Response parameter

Name	Type	Default	Description

Preliminary Rev.0

Not Subject to NDA

<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.

Preliminary Rev.0

Not Subject to NDA

3.8.8. 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.

Preliminary Rev.0

Not Subject to NDA

3.8.9. 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 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)

Preliminary Rev.0

Not Subject to NDA

<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.

Preliminary Rev.0

Not Subject to NDA

3.8.10. 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

AT+CUAD=?

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

Preliminary Rev.0

Not Subject to NDA

3.8.11. AT#SIMPR - SIM Presence Status

This 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. If notification is enabled, the ME informs the SIM status change through the following URC:

#SIMPR: <active_SIM>,<status>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	type of the notification

Values:

0 : disabled; It's possible only to query the current SIM status through read command.

1 : enabled; The ME informs the active SIM status change through the unsolicited indication.

Unsolicited fields:

Name	Type	Description
<active_SIM>	integer	current active SIM slot Values: 0 : SIM slot1 1 : SIM slot2
<status>	integer	current SIM status Values:

Preliminary Rev.0

Not Subject to NDA

0	:	SIM not inserted
1	:	SIM inserted

AT#SIMPR?

Read command reports the SIM presence status, both SIM slot1 and slot2, in the following format:

#SIMPR: <mode>,0,<status><CR><LF>
#SIMPR: <mode>,1,<status>

AT#SIMPR=?

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

If no SIMIN pin supported in product, <**status**> will always be '0'.

If SIMIN pin are supported and SIM are inserted in both SIM slot1 and slot2,

AT#SIMPR?

#SIMPR: 0,0,1

#SIMPR: 0,1,1

OK

Preliminary Rev.0

Not Subject to NDA

3.8.12. 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>,<active_slot>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	type of the notification

Values:

0 : disabled; It is only possible to query the current SIM status through read command.

1 : enabled; The ME informs SIM status change through the basic unsolicited indication where <status> range is 0...1.

2 : enabled; The ME informs SIM status change through the basic unsolicited indication where <status> range is 0...3.

Unsolicited fields:

Name	Type	Description
<status>	integer	current SIM status

Values:

0 : SIM not inserted

1 : SIM inserted

2 : SIM inserted and PIN unlocked

Preliminary Rev 0

Not Subject to NDA

		3 :	SIM inserted and READY (SMS and Phonebook access are possible)
<active_slot>	integer	current active SIM slot Values:	
		0 :	SIM slot1
		1 :	SIM slot2

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>,<active_slot>

AT#QSS=?

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

If AT#SIMDET=0,

AT#QSS?

#QSS:0,1,0

OK

If AT#SIMDET=1,

AT#QSS?

#QSS: 0,1,1

OK

Preliminary Rev.0

Not Subject to NDA

Preliminary Rev.0

Not Subject to NDA

3.8.13. 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 Values: 1 : SIM slot 1 2 : SIM slot 2	1	SIM slot

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=?

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

Preliminary Rev 0

Not Subject to NDA

3.8.14. AT#HSEN - Hot-Swap Enable

This command enables/disables the hot-swap function on SIM slot.

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

AT#HSEN=<mode>,<slot>

Set command enables/disables the hot-swap function on SIM slot.

Parameters:

Name	Type	Default	Description
<mode>	integer Values: 0 : disable 1 : enable	0	hot-swap mode
<slot>	integer Values: 0 : SIM slot1 1 : SIM slot2	N/A	SIM slot

For PTCRB/GCF certification, the default value of **<mode>** is 1 when **#FWSWITCH** is 0 or 1.

Please set as disable if you want not to use this feature.

If SIMIN pin is not connected, **<mode>** should be set to 0.

AT#HSEN?

Read command reports the hot-swap status on SIM slot, in the format:

Preliminary Rev.0

Not Subject to NDA

#HSEN: <mode>,0<CR><LF>

#HSEN: <mode>,1

AT#HSEN=?

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

If SIMIN pin is not connected, the hot-swap function cannot be supported.

Preliminary Rev.0

Not Subject to NDA

SIMIN pin is connected and SIM is inserted in SIM slot1.

AT#HSEN?

#HSEN: 0,0

#HSEN: 0,1

OK

AT#SIMPR?

#SIMPR: 1,0,1

#SIMPR: 1,1,0

OK

Enable the hot-swap function of SIM slot1.

AT#HSEN=1,0

OK

AT#REBOOT

OK

AT#HSEN?

#HSEN: 1,0

#HSEN: 0,1

OK

Remove SIM card on SIM slot 1.

#SIMPR: 0,0

Insert SIM card on SIM slot 1.

#SIMPR: 0,1

Preliminary Rev.0

Not Subject to NDA

3.8.15. AT#SIMINCFG - SIMIN Pin Configuration

This command configures the SIM detection mode on the SIMIN pin.

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

AT#SIMINCFG=<SIM_id>,<SIMIN_det_mode>

Set command sets the SIM detection mode on the SIMIN pin to detect the presence of a SIM.

Parameters:

Name	Type	Default	Description
<SIM_id>	integer	N/A	SIM slot index Values: 1 : SIM slot1 2 : SIM slot2
<SIMIN_det_mode>	integer	0	status of SIMIN pin for SIM detection Values: 0 : SIMIN pin LOW means SIM inserted, HIGH means SIM removed (for normal SIM holder). 1 : SIMIN pin LOW means SIM removed, HIGH means SIM inserted (for micro SIM holder)

AT#SIMINCFG?

Read command reports the detection mode of the configured SIMIN pin in the format:

#SIMINCFG: 1,<SIMIN_det_mode><CR><LF>
#SIMINCFG: 2,<SIMIN_det_mode>

Preliminary Rev 0

Not Subject to NDA

AT#SIMINCFG=?

Test command reports supported values of parameters <**SIM_id**> and <**SIMIN_det_mode**>.

If SIMIN pin is not connected, the hot-swap function cannot be supported.

Preliminary Rev.0

Not Subject to NDA

SIM is inserted in card slot1. The SIMIN is GND when SIM is inserted.

```
AT#SIMINCFG=1,0
OK
AT#SIMINCFG=2,0
OK
AT#REBOOT
OK
AT#SIMPR?
#SIMPR: 0,0,1
#SIMPR: 0,1,0
OK
```

Remove SIM in card slot1.

```
AT#SIMPR?
#SIMPR: 0,0,0
#SIMPR: 0,1,0
OK
```

SIM is inserted in card slot1. The SIMIN is GND when SIM is not inserted.

```
AT#SIMINCFG=1,1
OK
AT#SIMINCFG=2,1
OK
AT#REBOOT
OK
AT#SIMPR?
#SIMPR: 0,0,1
#SIMPR: 0,1,0
OK
```

Remove SIM in card slot1.

```
AT#SIMPR?
#SIMPR: 0,0,0
#SIMPR: 0,1,0
OK
```

Preliminary Rev.0

Not Subject to NDA

3.8.16. AT+CSUPI - Request 5G subscription permanent identifier

Request 5G subscription permanent identifier.

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

AT+CSUPI

Execution command causes the TA to return **<SUPI>**, which is intended to permit the TE to identify the individual USIM card or active application in the UICC which is attached to 5G MT.

Additional info:

The command returns the following message:

<SUPI>

Name	Type	Default	Description
<SUPI>	string	-	5G subscription permanent identifier (string without double quotes).

AT+CSUPI=?

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

Preliminary Rev 0

Not Subject to NDA

3.8.17. AT#SIMDET - SIM Detection Mode

This command specifies the SIM detection mode.

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

AT#SIMDET=<mode>

Set command specifies the SIM detection mode.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	SIM detection mode
	Values:		
	0 : switch to SIM slot1		
	1 : switch to SIM slot2		

AT#SIMDET?

Read command returns the currently selected SIM detection mode in the format:

#SIMDET: <mode>,<simin>

Additional info:

▶▶ Response parameters

Name	Type	Default	Description
<mode>	integer	-	SIM detection mode
<simin>	integer	N/A	SIMIN pin real status

Preliminary Rev.0

Not Subject to NDA

Values:

0 : SIM is not inserted

1 : SIM is inserted

If no SIMIN pin supported in product, <**simin**> will always be '0'.

AT#SIMDET=?

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

Preliminary Rev.0

Not Subject to NDA

3.9. SIM Toolkit

3.9.1. 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. 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

Preliminary Rev.0

Not Subject to NDA

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	2	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 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>

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Not Subject to NDA

- <**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)
  <**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>

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Not Subject to NDA

- <**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>

  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

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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.

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**).

Preliminary Rev.0

Not Subject to NDA

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.

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**>.

Preliminary Rev.0

Not Subject to NDA

3.9.2. 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

20 : SEND DTMF

32 : PLAY TONE

33 : DISPLAY TEXT

Preliminary Rev.0

Not Subject to NDA

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

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>

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Not Subject to NDA

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) **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:

Preliminary Rev.0

Not Subject to NDA

0 : set up call, but only if not currently busy on another call

1 : set up call, but only if not currently busy on another call, with redial

2 : set up call, putting all other calls (if any) on hold

3 : set up call, putting all other calls (if any) on hold, with redial

4 : set up call, disconnecting all other calls (if any)

5 : set up call, disconnecting all other calls (if any), with redial

<confirmationText>	string	-	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>]

Preliminary Rev 0

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 - normal priority 1 - high priority **bits 1-6**: reserved for future use **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

Preliminary Rev.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 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:

Preliminary Rev.0

Not Subject to NDA

	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>]

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

Preliminary Rev.0

Not Subject to NDA

			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
<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

Preliminary Rev.0

Not Subject to NDA

			bit 7: 0 - no help information available 1 - help information available Value: 0x00÷0x81 : 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
<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?

Preliminary Rev.0

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.

Preliminary Rev.0

Not Subject to NDA

3.9.3. 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 20 : USSD/SS Transaction terminated by user 32 : TA currently unable to process command 34 : user has denied SIM/USIM call setup request

Preliminary Rev.0

Not Subject to NDA

		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.

- <**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

Preliminary Rev.0

Not Subject to NDA

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
<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**>.

Preliminary Rev.0

Not Subject to NDA

3.9.4. 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>**.

Preliminary Rev.0

Not Subject to NDA

3.9.5. 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.

Preliminary Rev.0

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
```

Preliminary Rev.0

Not Subject to NDA

3.10. Power Down

3.10.1. 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)

Preliminary Rev.0

Not Subject to NDA

3.10.2. AT#SHDN - Software Shutdown

Software Shutdown

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

AT#SHDN

Execution command causes device detachment from the network and shut down.

Before definitive shut down an **OK** response is returned.

After the issuing of this command any previous activity is terminated and the device will not respond to any further command.

AT#SHDN=?

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

If hardware pin FULL_CARD_POWER_OFF_N is maintained to High, module will turn on automatically after shutdown.

Preliminary Rev.0

Not Subject to NDA

3.10.3. 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 or Low to High 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>[,<GPIO>[,<trigger>]]]

Set command to configure fast power down. Module enters power off autonomously if fast power down is enabled and GPIO event is triggered after modem boot done.

Parameters:

Name	Type	Default	Description
<enable>	integer	0	enable/disable the fast shutdown execution via a GPIO pin. Values: 0 : disabled 1 : enabled
<GPIO>	integer	-	GPIO number used to execute the fast shutdown. Can check the available GPIO range from **#FASTSHDN=?** command. This parameter is no meaning when **<mode>** is 0.
<trigger>	integer	0	GPIO trigger level used for fast shutdown execution. This parameter is no meaning when **<mode>** is 0. Values: 0 : execute fast shutdown when the selected GPIO pin goes from High to Low level 1 : execute fast shutdown when the selected GPIO pin goes from Low to High level

Additional info:

- The execution command **AT#FASTSHDN** forces the module to execute immediately the fast shutdown regardless of the fast shutdown configuration.

Preliminary Rev.0

Not Subject to NDA

Depending on **<trigger>**, the selected **<GPIO>** pin is automatically configured as below.

<trigger> = 0, **<GPIO>** pin set as Pull-up

1, **<GPIO>** pin set as Pull-down

Configuration values are stored on module and will keep on next power cycle.

AT#FASTSHDN?

Read command reports the currently selected configuration in the format:

#FASTSHDN: <enable>,<GPIO>[,<trigger>]

AT#FASTSHDN=?

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

Enable fast shutdown on GPIO_05

AT#FASTSHDN=1,5

OK

AT#FASTSHDN?

#FASTSHDN: 1,5

OK

Force immediate fast shutdown

AT#FASTSHDN

OK

Preliminary Rev.0

Not Subject to NDA

3.11. HW and Radio Control

3.11.1. AT#GPIO - General Purpose Input/Output Pin Control

Set the value of the GPIO(general purpose input/output) pins.

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 or reads current state of the GPIO(general purpose input/output) pin.

Parameters:

Name	Type	Default	Description
<pin>	integer	-	GPIO pin number. The supported range is hardware dependent. Use AT#GPIO=? test command to know available range.
<mode>	integer	4	sets GPIO pin configuration, its action depends on **<dir>** value. Refer to Additional info sections. Values: 0 : set GPIO pin to 0(Low) if <dir>=1(Output), otherwise has no meaning 1 : set GPIO pin to 1(High) if <dir>=1(Output), otherwise has no meaning 2 : reports current direction and value of GPIO pin 3 : set internal pull-up if <dir>=0(Input), otherwise has no meaning 4 : set internal pull-down if <dir>=0(Input), otherwise has no meaning 5 : set internal no-pull if <dir>=0(Input), otherwise has no meaning

Preliminary Rev.0

Not Subject to NDA

<dir>	integer	0	sets the GPIO pin in input or output. Refer to Additional info sections. Values: 0 : pin set as input 1 : pin set as output
<save>	integer	0	GPIO pin save configuration. Values: 0 : GPIO pin configuration is not saved 1 : GPIO pin configuration is saved

Additional info:

- When **<mode>**=2, reports current direction and value of **<pin>** in the below format and in this mode, **<dir>** and **<save>** can be omitted.

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

Name	Type	Description
<dir>	integer	current direction of the selected GPIO**<pin>**. 0 : GPIO is input 1 : GPIO is output 2 - 11 : GPIO is assigned as Alternate function
<stat>	integer	the parameter can be: logic value read from GPIO**<pin>** in the case the pin **<dir>** is set to input. logic value present in output of the GPIO**<pin>** in the case the pin **<dir>** is currently set to output. no meaning value for the pin GPIO**<pin>** in the case the pin **<dir>** is set to alternate function.
<mode>	integer	shown if GPIO**<pin>** is input: 3 : internal pull-up 4 : internal pull-down 5 : internal no-pull

- **<dir>** values from 2 to 11 means the GPIO is assigned as alternate function respectively from ALT1 to ALT10.

ALTx	Function associated to ALTx
ALT1 (**<dir>**=2)	reserved

Preliminary Rev.0

Not Subject to NDA

ALT2 (**<dir>**=3)	assigned as DVI for Audio
ALT3 ~ ALT6 (**<dir>**=4 ~ 7)	reserved
ALT7 (**<dir>**=8)	assigned as I2C
ALT8 ~ ALT9 (**<dir>**=9 ~ 10)	reserved
ALT10 (**<dir>**=11)	W_DISABLE2_N for GNSS disable

While using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and must be avoided.

AT#GPIO?

Read command reports the current direction and value of all GPIO pins, in the format:

#GPIO: <dir>,<stat>[<CR><LF>#GPIO: <dir>,<stat>[...]]

If **<mode>**=3, 4 or 5, the output format is:

#GPIO: <dir>,<stat>,<mode>[<CR><LF>#GPIO: <dir>,<stat>,<mode>[...]]

AT#GPIO=?

Test command reports the supported range of values of the command parameters **<pin>**, **<mode>**, **<dir>** and **<save>**.

GPIO_01, GPIO_06, GPIO_07, GPIO_08 are assigned to DVI for audio as default.

GPIO_09 and GPIO_10 are assigned to I2C alternate function as default.

GPIO_13 is assigned as W_DISABLE2_N for GNSS disable as default.

Preliminary Rev 0

Not Subject to NDA

Check the available values ranges
AT#GPIO=?
#GPIO: (1-4,6-10,12,13),(0-5),(0-1),(0,1)

OK

Set GPIO_03 as output, and set logical value HIGH
AT#GPIO=3,1,1
OK

Set GPIO_04 as output, value HIGH a save setting
AT#GPIO=4,1,1,1
OK

Report GPIO_03 state
AT#GPIO=3,2
#GPIO: 1,1

OK

Read command
AT#GPIO?
#GPIO: 3,0,0 // GPIO_01 is assigned as ALT2
#GPIO: 0,0,4 // GPIO_02 is input with internal pull down
#GPIO: 1,1,1 // GPIO_03 is output, value is HIGH
#GPIO: 0,0,4
#GPIO: 0,1,3 // GPIO_06 is input with internal pull up, value is HIGH
#GPIO: 1,0,0 // GPIO_07 is output, value is LOW

OK

Preliminary Rev.0

Not Subject to NDA

3.11.2. 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=<DIV_enable>[,<DARP_mode>]

Set command enables/disables the RX Diversity and sets DARP.

Parameters:

Name	Type	Default	Description
<DIV_enable>	integer Values: 0 : disable 1 : enable	1	enable/disable the RX Diversity
<DARP_mode>	integer Values: 0 : DARP not supported 1 : DARP phase 1	0	select DARP mode

The values set by command are available at next power-on.

The values set by command are directly stored in NVM.

This project does not support the GSM access technology, so DARP mode is not support (only for backward compatibility).

Case of #RXTOGGLE already set "1", #RXDIV don't set "1" (Error return).

Preliminary Rev.0

Not Subject to NDA

AT#RXDIV?

Read command reports the currently selected **<DIV_enable>** and **<DARP_mode>** parameters in the format:
#RXDIV: <DIV_enable>,<DARP_mode>

AT#RXDIV=?

Test command reports the supported values of parameters **<DIV_enable>** and **<DARP_mode>**.

Preliminary Rev.0

Not Subject to NDA

3.11.3. 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	0	toggle between normal to diversity antenna Values: 0 : set the RX to the main antenna 1 : set the RX to the diversity antenna

- Please disable usage of two antennas (AT#RXDIV=0) before swap antennas.
- Case of Diversity receiver path(RD) already set(#RXDIV=1), #RXTOGGLE command don't set "1"(Error return).
- 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:

#RXTOGGLE: <TOGGLE_enable>

AT#RXTOGGLE=?

Test command reports the supported range of values.

Preliminary Rev.0

Not Subject to NDA

AT#RXDIV?
#RXDIV: 1,1
AT#RXTOGGLE=1 (When RXDIV=1, RXTOGGLE command return ERROR.)
ERROR
AT#RXDIV=0 disable the RX Diversity
OK
AT#RXTOGGLE=1 set the RX to the diversity antenna
OK
AT#REBOOT reboot the module
OK
AT+COPS=0 register to the 3G network
OK
AT+CREG=1 enable network registration unsolicited result code
OK
AT+CREG? read <mode> and <stat> parameters
+CREG: 1,1
OK

Preliminary Rev.0

Not Subject to NDA

3.12. IPEasy

3.12.1. AT#ICMP - Ping Support

This command enables/disables the ICMP Ping support.

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

AT#ICMP=<mode>

Set command enables/disables the ICMP Ping support.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	ICMP mode selection.

Values:

0 : disable ICMP Ping support

1 : enable firewalled ICMP Ping support (Not available)

2 : enable free ICMP Ping support; the module is sending a proper ECHO_REPLY to every IP Address pinging it.

AT#ICMP?

Read command returns whether the ICMP Ping support is currently enabled or not, in the format:

#ICMP: <mode>

AT#ICMP=?

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

Preliminary Rev.0

Not Subject to NDA

3.13. M2M

3.13.1. 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 the current args remained unchanged. See the following examples: 9. **AT#M2MARG=app.bin,arg1,arg2,...,argN** set the arguments to "/data/azc/mod/app.bin" if it exists 10. **AT#M2MARG=,arg,arg2,...,argN** set the arguments to all executables

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11. **AT#M2MARG=app.bin,**
delete the arguments of "/mod/app.bin" if it exists

12. **AT#M2MARG=,**
delete the arguments of all executable

13. **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 "/data/azc/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>

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

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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

Preliminary Rev.0

Not Subject to NDA

3.13.2. 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?

Read command reports the current working directory in the current drive in the M2M file system in the format:

#M2MCHDIR: <path_name>

Additional info:

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Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.13.3. 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: â ¢ full directory path name starting with "/" â ¢ relative directory path name â ¢ 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

AT#M2MRMDIR=?

Test command returns OK.

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Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.13.4. 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 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.

Preliminary Rev 0

Not Subject to NDA

* **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

▶▶ 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**

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Not Subject to NDA

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

* **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.

Preliminary Rev.0

Not Subject to NDA

Parameters setting provided **<mode>** with in boot mode range is saved on "/data/azc/mod/appcfg.ini" file

Executables are binary files with ".bin" extension saved in "/data/azc/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 Values: 0 : ready 1 : starting (not yet in running)

Preliminary Rev.0

Not Subject to NDA

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)

Preliminary Rev.0

Not Subject to NDA

3.13.5. 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.

Name	Type	Default	Description
<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 port can disable the AppZone engine, and it will not start until the next reboot.

Preliminary Rev.0

Not Subject to NDA

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>**

Preliminary Rev.0

Not Subject to NDA

3.13.6. 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
#M2MRAM #M2MARG #TRACE

AT#M2MATP?

Read command return current M2M AT parser mode

AT#M2MATP=?

Test command return the supported ranges

Preliminary Rev.0

Not Subject to NDA

3.13.7. 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 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.

Preliminary Rev.0

Not Subject to NDA

<file_name> can be equivalently enclosed on quote or not.

<file_name> and its path are case sensitive.

Writing action allowed only in â œ/dataâ • and its sub-directories. Other directories are used for read only

AT#M2MWRITE=?

Test commands returns **OK** result code.

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

Preliminary Rev.0

Not Subject to NDA

3.13.8. 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: â ¢ full file path name starting with "/" â ¢ relative file path name â ¢ 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=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.13.9. 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: â ¢ full directory path if starting with "/" â ¢ relative directory path name â ¢ 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
<.>	string	-	current directory
<..>	string	-	upper directory
<dir_name>	string	-	directory name, string type delimited by < and > (max 255 characters, case sensitive)

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<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=?

Test command returns **OK** result code.

Preliminary Rev.0

Not Subject to NDA

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

Preliminary Rev.0

Not Subject to NDA

3.13.10. 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

AT#M2MREAD=?

Test command returns **OK** result code.

Preliminary Rev 0

Not Subject to NDA

AT#M2MREAD="/xxfolder/config/config.txt"
<<< *here receive the prompt; then the file is displayed, immediately after the prompt*
OK

AT#M2MCHDIR="/xxfolder"

OK

AT#M2MREAD=config/config.txt

<<< *here receive the prompt; then the file is displayed, immediately after the prompt*

OK

Preliminary Rev.0

Not Subject to NDA

3.13.11. 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
<chunkPrint>	integer	0	chunk print mode Values:

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Not Subject to NDA

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.

Preliminary Rev.0

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

Preliminary Rev.0

Not Subject to NDA

3.13.12. 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
```

Preliminary Rev.0

Not Subject to NDA

3.14. GNSS

3.14.1. GNSS Configuration

3.14.1.1. AT$GPSNVRAM - Delete GNSS NVRAM Parameters

Delete GPS NVRAM parameters

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

AT$GPSNVRAM=<bitField>,<action>

Execution command is used to delete the GPS information stored in NVRAM.

Parameters:

Name	Type	Default	Description
<bitField>	integer	15	The assistance data mask for the type(s) of GPS data to read/delete with the following meaning: 1: Ephemeris 2: Location 4: Time 8: Almanac Value: 1÷15 : data mask value
<action>	integer	0	command action Value: 0 : delete data described in bitfield

AT$GPSNVRAM?

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

Not Subject to NDA

Preliminary Rev.0

$GPSNVRAM: <bitField>

AT$GPSNVRAM=?

Test command returns the supported range of values for parameters <**bitField**> and <**action**>.

The current setting is stored through **$GPSSAV** command.

```
AT$GPSNVRAM=15,0
OK
```

Preliminary Rev.0

Not Subject to NDA

3.14.1.2. 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=<slp_address_type>[,<slp_address>[,<slp_port_number>]]

Set command allows to update the SLP address and SLP port number.

Parameters:

Name	Type	Default	Description
<slp_address_type>	integer	2	SLP address type Values: 0 : IPv4 1 : FQDN 2 : IMSI 3 : IPv6 (if the IPv6 is supported)
<slp_address>	string	-	SLP address in FQDN format or IPv4/IPv6 format
<slp_port_number>	integer	-	SLP port number. Default value is 7275.

If <**slp_address_type**> is 0, 1 or 3, then <**slp_address**> is a mandatory.

If <**slp_address_type**> is 2, then <**slp_address**> and <**slp_port_number**> are not required.

AT$LCSSLP?

Read command returns the current SLP address.

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Not Subject to NDA

AT$LCSSLP=?

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

Preliminary Rev.0

Not Subject to NDA

3.14.1.3. AT$LCSTER - Update Terminal Information

This command updates the terminal information like IMSI, MSISDN or IPv4/IPv6 address.

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

AT$LCSTER=<id_type>[,<id_value>[,<pref_pos_mode>[,<tls_mode>]]]

Set command updates the terminal information like IMSI, MSISDN or IPv4/IPv6 address.

Parameters:

Name	Type	Default	Description
<id_type>	integer	1	a number which can have any of the following values Values: 0 : MSIDSN 1 : IMSI 2 : IPv4 address 3 : IPv6 address (if IPv6 is supported) 4 : Invalid
<id_value>	string	-	as defined in **<id_type>**
<pref_pos_mode>	integer	0	preferred position mode Values: 0 : default position mode 1 : none preferred position mode
<tls_mode>	integer	1	indicates if TLS mode should/should not be used by the SET Values: 0 : non-TLS mode

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Not Subject to NDA

1 : TLS mode

The following parameters are included only for backward compatibility and have no effect.

<**id_type**>, <**id_value**> and <**pref_pos_mode**>

If **<id_type>** is MSISDN ,IPv4 address or IPv6 address, then **<id_value>** shall be entered.

Preliminary Rev.0

Not Subject to NDA

3.14.1.4. AT$LCSLRMT - Mobile Terminated Location Request (MT-LR)

The network can request the current location of a target MS. This command allows to enable the unsolicited response that inform that an MT incoming call is arrived.

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

AT$LCSLRMT=<mode>

Set command is used to enable/disable unsolicited response. The URC format is:

$LCSLRMT: <TransportProtocol>,<NotifType>,<LocEstimateType>,<ClientId>, <ClientNameEncodingType>,<ClientNameType>,<ClientName>,<RequestorIdEncodingType>, <RequestorIdType>,<RequestorId>,<Codeword>,<ServiceTypeId>,<ReqId>

Parameter:

Name	Type	Default	Description
<mode>	integer Values: 0 : disable unsolicited 1 : enable unsolicited	1	enable\disable unsolicited

Unsolicited fields:

Name	Type	Description
<TransportProtocol>	integer	Transport protocol used Values: 0 : C-Plane Protocol 1 : SUPL Protocol 2 : Invalid
<NotifType>	integer	Notify type Values:

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Not Subject to NDA

		0 : Notify 1 : Verify request (no response will be treated as permission granted, see $LCSLRV) 2 : Verify request (no response will be treated as permission denied, see $LCSLRV)
<LocEstimateType>	integer	Location estimate type Values: 0 : Current location 1 : Current or Last Location Known 2 : Initial location
<RequestorIdEncodingtype>	integer	Client Identification Values: 0 : UCS2 1 : GSM default format 2 : UTF-8 format 3 : invalid format
<ClientNameEncodingType>	integer	Encoding type of the Client Name Values: 0 : UCS2 1 : GSM default format 2 : UTF-8 format 3 : invalid format
<ClientNameType>	integer	Type of Client Name Values: 0 : logical name

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Not Subject to NDA

		1 : email-address 2 : MSISDN 3 : URL of client 4 : SIP URL 5 : MIN 6 : MDN 7 : IMS Public Identity 8 : invalid type
<RequestorIdType>	integer	Type of the Requestor Id Values: 0 : logical name 1 : email-address 2 : MSISDN 3 : URL of client 4 : SIP URL 5 : MIN 6 : MDN 7 : IMS Public Identity 8 : invalid type
<ClientName>	string	Name of Client displayed as per data coding scheme
<RequestorId>	string	Requestor Id displayed as per data coding scheme
<CodeWord>	string	Codeword displayed as per data coding scheme
<ServiceTypeId>	integer	Id of service Type (0-127)
<ReqId>	integer	Identification of the request

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<ReqId> uniquely identifies the MT-LR sent by the network and the same <reqid> shall be used in **$LCSLRV** command in case the **<Notif_type>** is of type "Verify request".

AT$LCSLRMT?

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

AT$LCSLRMT=?

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

Preliminary Rev.0

Not Subject to NDA

3.14.1.5. 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: 0 : Root Certificate

Execution command deletes the certificates stored in NVM.

Preliminary Rev.0

Not Subject to NDA

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.

Preliminary Rev.0

Not Subject to NDA

3.14.1.6. 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:

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

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Not Subject to NDA

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

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

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Not Subject to NDA

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.

$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

Preliminary Rev.0

Not Subject to NDA

3.14.1.7. 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?

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

AT$GPSSTOP=?

Test command returns **OK** result code.

Preliminary Rev 0

Not Subject to NDA

Preliminary Rev.0

Not Subject to NDA

3.14.1.8. AT$GPSSLSR - Start Location Service Request

This command configures the GPS Start Location Service Request.

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 used to start the Receiver in Autonomous or A-GPS mode.

Parameters:

Name	Type	Default	Description
<transport_protocol>	integer	2	Configure transport protocol. Values: 0 : CPlane 1 : SUPL 2 : Invalid
<pos_mode>	integer	3	Configure MS Based mode. 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.

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<clientid_type>	integer	N/A	Configure client ID type. 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.
<mlcnumber_type>	integer	N/A	Configure mlc type. Values: 0 : MSISDN 1 : Invalid
<interval>	integer	1	Configure interval period. 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. 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

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Not Subject to NDA

1 : display user name as anonymous at the external client

Additional info:

▶▶ If C-PLANE or SUPL session is not successfully completed, it will be stopped, and unsolicited indication reports the error cause in the following formats:

$GPSSLSR: C-PLANE ERROR,<error_code>

or

$GPSSLSR: SUPL ERROR,<error_code>

<error_code>	
1	Session failed.
2	Fix request failed because the session timed out.
3	Fix request failed due to bad parameters in the request.
4	Fix request failed because the phone is offline.
5	Fix request failed because the engine is locked.

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>]]]]]]

Preliminary Rev.0

Not Subject to NDA

AT$GPSSLSR=?

Test command returns the list of supported SLSR values for each field.

$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
```

Preliminary Rev.0

Not Subject to NDA

3.14.1.9. AT$LCSLRV - Location Request Verification

Location request verification

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

AT$LCSLRV=<permission>,<reqid>

Set command is used to verify a location request coming from the network. The verification is sent back to the network with request id.

Parameters:

Name	Type	Default	Description
<permission>	integer	0	set the permission Values: 0 : permission denied 1 : permission granted
<reqid>	string	-	uniquely identifies the MT-LR sent by the network

AT$LCSLRV=?

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

The <**reqid**> must use the identical value as <**reqid**> of following **$LCSLRMT** (see **$LCSLRMT**).

Preliminary Rev 0

Not Subject to NDA

3.14.1.10. AT$GPSAPN - Set GPS APN Profile

This command sets the GPS APN profile.

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

AT$GPSAPN=<profile>[,<pdptype>,<apnname>]

Set command sets the GPS APN profile.

Parameters:

Name	Type	Default	Description
<profile>	integer	0	GPS APN profile type Value: 0 : SUPL APN profile
<pdptype>	integer	N/A	GPS APN PDP type Values: 0 : IPV4 1 : IPV6 2 : IPV4V6
<apnname>	string	-	GPS APN name; The maximum length is 100.

AT$GPSAPN?

Read command returns the current GPS APN profile in the format:

$GPSAPN: <profile>,<pdptype>,<apnname>

AT$GPSAPN=?

Preliminary Rev.0

Not Subject to NDA

Test command returns the supported range of parameters <**profile**> and <**pdptype**> and the maximum length of <**apnname**> in the format:

$GPSAPN: (the supported range of <**profile**>),(the supported range of <**pdptype**>),**<apnname_length>**

Additional info:

▶▶ response fields

Name	Type	Default	Description
<apnname_length>	integer	-	the maximum length of field <**apnname**>

If the parameter <**profile**> only exists, the profile is deleted.

The GPS APN profile for SUPL session should be defined with same APN of **+CGDCONT** command. (See **+CGDCONT**)

Preliminary Rev.0

Not Subject to NDA

3.14.1.11. 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?

Read command returns the currently selected GNSS capability in the format:

$AGPSEN: <mode>

Preliminary Rev.0

Not Subject to NDA

AT$AGPSEN=?

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

$AGPSEN: (the supported range of <mode>)

Preliminary Rev.0

Not Subject to NDA

3.14.1.12. 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

The default value depends on operator.

For LM9x0 series,

- VZW / T-Mobile: **3**
- Others: **2**

For Fx980/LN920 series,

- Generic / VZW / T-Mobile / NTT / TELSTRA: **3**
- KDDI : **1**
- Others: **2**

AT$LCSLPP?

Read command returns the currently selected configuration for LPP protocol in the format:

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Not Subject to NDA

$LCSLPP: <mode>

AT$LCSLPP=?

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

$LCSLPP: (the supported range of <mode>)

Preliminary Rev.0

Not Subject to NDA

3.14.1.13. 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

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**

Preliminary Rev.0

Not Subject to NDA

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**)

Preliminary Rev.0

Not Subject to NDA

3.14.1.14. AT#LOCAUTOSTART - GNSS Auto Start Configuration

This command is related to GNSS auto start configuration.

Refer to QMI Command Reference Guide.

- QMI_GMS_LOC_GET_AUTO_START
- QMI_GMS_LOC_SET_AUTO_START

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

AT#LOCAUTOSTART=<function>,<fix_type>,<max_time>,<max_dist>,<fix_rate>

Set command sets the GNSS auto start configuration.

Parameters:

Name	Type	Default	Description
<function>	integer	2	setting to indicate when modem should start an automatic Values: 0 : disable 1 : AT bootup 2 : when NMEA port is opened (Default with OEM PRI setting)
<fix_type>	integer	4	Type of GNSS fix Values: 1 : default engine mode 2 : MS-based 3 : MS-assisted 4 : Standalone (Default with OEM PRI setting)

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Not Subject to NDA

<max_time>	integer	255	maximum time allowed for the receiver to get a fix in seconds Value: 1÷255 : Default with OEM PRI setting: 255
<max_dist>	integer	1000	maximum uncertainty of a fix measured by distance in meters Value: 1÷4294967280 : Default with OEM PRI setting: 1000
<fix_rate>	integer	1	time between fixes in seconds Value: 1÷65535 : Default with OEM PRI setting: 1

This settings affect the current GNSS settings.

- <**fix_type**>: <**transport_protocol**> and <**pos_mode**> of **$GPSSLSR**
- <**fix_rate**>: <**interval**> of **$GPSSLSR**
- <**max_time**>: <**rsp_time**> of **$GPSQOS**
- <**max_dist**>: <**horiz_accuracy**> of **$GPSQOS**

The Defaults or parameters are values after applying OEM PRI setting.

AT#LOCAUTOSTART?

Read command returns the current GNSS Auto Start setting, in the format:

#LOCAUTOSTART: <function>,<fix_type>,<max_time>,<max_dist>,<fix_rate>

Default response without OEM PRI settings:

#LOCAUTOSTART: 255,,,,

Additional info:

▶▶ where

Preliminary Rev.0

Not Subject to NDA

Name	Type	Default	Description
<function>	integer	255	setting to indicate when modem should start an automatic Values: 0 : disable 1 : AT bootup 2 : when NMEA port is opened 255 : not reported by modem (Default without OEM PRI setting)

AT#LOCAUTOSTART=?

Test command returns the supported range of values for parameters <**function**>, <**fix_type**>, <**max_time**>, <**max_dist**> and <**fix_rate**>.

Preliminary Rev.0

Not Subject to NDA

3.14.1.15. AT#LOCNMEATYPE - NMEA Type Configuration

This command is related to NMEA type setting.

Refer to QMI Command Reference Guide.

- QMI_GMS_LOC_SET_NMEA_TYPE

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

AT#LOCNMEATYPE=<nmea_mode_ind>[,<nmea_type>]

Set command sets the NMEA type configuration.

Parameters:

Name	Type	Default	Description
<nmea_mode_ind>	integer	N/A	Execute the Location Fix start or stop. Indicate whether NMEA port is opened or not Values: 0 : NMEA streaming stop 1 : NMEA streaming start
<nmea_type>	integer	N/A	Set NMEA type mask to modem Values: 0 : Disable NMEA type 1÷134020607 : NMEA type mask

Additional info:

- the bit mask values of <**nmea_type**>:
  default with OEM PRI setting: 134020607
  default without OEM PRI setting: 0

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Not Subject to NDA

- 0x00000001 - Enable GPGGA type
- 0x00000002 - Enable GPRMC type
- 0x00000004 - Enable GPGSV type
- 0x00000008 - Enable GPGSA type
- 0x00000010 - Enable GPVTG type
- 0x00000020 - Enable GPGLL type
- 0x00000040 - Enable GLGSV type
- 0x00000080 - Enable GNGSA type
- 0x00000100 - Enable GNGNS type
- 0x00000400 - Enable GARMC type
- 0x00000800 - Enable GAGSV type
- 0x00001000 - Enable GAGSA type
- 0x00002000 - Enable GAVTG type
- 0x00004000 - Enable GAGGA type
- 0x00008000 - Enable BDGSV type
- 0x00040000 - Enable GPGNS type
- 0x00080000 - Enable GLGNS type
- 0x00100000 - Enable GNGSV type
- 0x00200000 - Enable GAGNS type
- 0x00400000 - Enable BDGSA type
- 0x00800000 - Enable BDRMC type
- 0x01000000 - Enable BDVTG type
- 0x02000000 - Enable BDGGA type
- 0x04000000 - Enable BDGNS type

For <**nmea_mode_ind**> value, each value means the following description,

- NMEA streaming start: GPS engine start location fix and start to stream out NMEA sentences.

- NMEA streaming stop: GPS engine stop location fix and stop NMEA streaming.

The current setting <**nmea_type**> is stored in NVM.

The Default of <**nmea_type**> is value after applying OEM PRI setting.

Preliminary Rev.0

Not Subject to NDA

If **$GPSNMUN** or **$GPSNMUNEX** command is already used, the user should avoid using this command because this setting have an effect on **$GPSNMUN** and **$GPSNMUNEX** operation.

AT#LOCNMEATYPE?

Read command returns the current NMEA type configuration, in the format:

#LOCNMEATYPE: <nmea_type>

AT#LOCNMEATYPE=?

Test command reports the supported range of values for parameters <**nmea_mode_ind**> and <**nmea_type**>.

Preliminary Rev.0

Not Subject to NDA

3.14.1.16. 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?

Read command returns the values of saved GpsOneXTRA feature <mode>.

$XTRAEN: <mode>

AT$XTRAEN=?

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

$XTRAEN: (0,1)

New setting is applicable across device power cycles.

The current setting is stored in NVM.

If gpsOneXTRA feature is enabled, the unintentional data usage can be occurred. Please set as disable if you want not to use this feature.

If gpsOneXTRA feature is enabled, the following describes only the general behaviors of XTRA client.

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.

1) XTRA data download

- XTRA data downloading **always requires data service**. The pending XTRA data download is resumed after data connection is available.

2) XTRA data download Initiation

- After power-up: XTRA client initiates XTRA data download after power-up and data service is connected.

- On-demand: When the modem requests for XTRA data download, XTRA client initiates XTRA data download.

3) Download throttle mechanism

- The maximum number of downloads per UTC day are **three**. After this download limit is reached, no download request is accepted on that day.

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- The following describes only the general gpsOneXTRA behaviors.

- Enable gpsOneXTRA Feature.

```
AT$XTRAEN?
$XTRAEN: 0

OK
```

```
AT$XTRAEN=1
OK
AT#REBOOT
OK
```

```
AT$XTRAEN?
$XTRAEN: 1

OK
```

- Enable Data connection (See #ICMCONNECT)

```
AT+CGDCONT?
+CGDCONT:
1,"IPV4V6","lte.sktelecom.com","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0,,,,,,,,,"",,,,0

OK
```

```
AT#ICMCONNECT="CON",1,4
OK
AT#ICMCONNECT="CON",1,6
OK
```

```
AT#ICMCONNECT?
#ICMCONNECT: 1,1,1,1,1

OK
```

- Check the standalone GNSS mode.

```
AT$GPSSLSR?
$GPSSLSR: 2,3,,,,,1,255

OK
```

- On-demand Trigger with cold start for example.

```
AT$GPSR=1
OK
AT$GPSP=1
OK
```

- **After few seconds, the GNSS SVs information from XTRA Data download is displayed on NMEA stream and can get a fix soon.**

```
AT$GPSNMUN?
$GPSNMUN: 2,1,1,1,1,1,1

OK
```

```
$GPGSA,A,1,,,,,,,,,,,,,,,*32
$GPVTG,,T,,M,,N,,K,N*2C
$GPRMC,,V,,,,,,,,,,N,V*29
$GPGGA,,,,,,0,,,,,,,,*66
$GPGLL,,,,,,V,N*64
```

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$GPGSA,A,1,,,,,,,,,,,,,,*32
$GPVTG,,T,,M,,N,,K,N*2C
$GPRMC,,V,,,,,,,,,,N,V*29
$GPGGA,,,,,,0,,,,,,,,*66
$GPGLL,,,,,,V,N*64
$GPGSV,3,1,12,16,58,274,34,31,56,085,38,03,08,261,,04,36,306,,1*64
$GPGSV,3,2,12,08,00,000,,09,07,322,,18,11,099,,22,02,237,,1*6E
$GPGSV,3,3,12,26,71,345,,27,27,194,,29,22,042,,32,08,160,,1*68
$GPGSA,A,1,,,,,,,,,,,,,,*32
$GPVTG,,T,,M,,N,,K,N*2C
$GPRMC,,V,,,,,,,,,,N,V*29
$GPGGA,,,,,,0,,,,,,,,*66
$GPGLL,,,,,,V,N*64
$GPGSV,3,1,12,04,36,306,31,16,58,274,34,26,71,345,37,31,56,085,39,1*6D
$GPGSV,3,2,12,03,08,261,,08,00,000,,09,07,322,,18,11,099,,1*64
$GPGSV,3,3,12,22,02,237,,27,27,194,,29,22,042,,32,08,160,,1*6C
$GPGSA,A,1,,,,,,,,,,,,,,*32
$GPVTG,,T,,M,,N,,K,N*2C
$GPRMC,,V,,,,,,,,,,N,V*29
$GPGGA,,,,,,0,,,,,,,,*66
$GPGLL,,,,,,V,N*64
$GPGSV,3,1,12,04,36,306,34,16,58,274,34,26,71,345,38,31,56,085,40,1*69
$GPGSV,3,2,12,03,08,261,,08,00,000,,09,07,322,,18,11,099,,1*64
$GPGSV,3,3,12,22,02,237,,27,27,194,,29,22,042,,32,08,160,,1*6C
$GPGSA,A,3,04,16,26,31,,,,,,,,,4.1,2.1,3.5,1*2A
$GPVTG,203.1,T,203.1,M,23.1,N,42.7,K,A*22
$GPRMC,013356.18,A,3731.301587,N,12655.781339,E,23.1,203.1,080421,6.0,W,A,V*63
$GPGGA,013356.18,3731.301587,N,12655.781339,E,1,04,2.1,92.1,M,18.0,M,,*5F
$GPGLL,3731.301587,N,12655.781339,E,013356.18,A,A*6E

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Not Subject to NDA

3.14.2. GNSS Receiver

3.14.2.1. 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, $GPSQOS, $GPSSLSR and $GPSSTOP 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".

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3.14.2.2. 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, $GPSQOS, $GPSSLSR and $GPSSTOP commands.

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3.14.2.3. 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.

AT$GPSP?

The read command reports the current value of the <**status**> parameter, in the format:

$GPSP: <status>

Where:

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<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
```

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Not Subject to NDA

3.14.3. GNSS General Management

3.14.3.1. AT$GNSSCONF - Configuration of the GNSS receiver

This command is used to configure the capabilities of the GNSS receiver.

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

AT$GNSSCONF=<combination>[,<worldwide>]

Set command configures the capabilities of the GNSS receiver.

Parameters:

Name	Type	Default	Description
<combination>	integer	9	GNSS configuration Values: 0 : GPS Only 1 : GPS + GLONASS 2 : GPS + GALILEO 3 : GPS + GLONASS + GALILEO 4 : GPS + GLONASS + BEIDOU 5 : GPS + BEIDOU + GALILEO 6 : GPS + GLONASS + BEIDOU + GALILEO 7 : GPS + GLONASS + QZSS 8 : GPS + GLONASS + BEIDOU + QZSS 9 : GPS + GLONASS + BEIDOU + GALILEO + QZSS
<worldwide>	integer	0	Applicable area The BEIDOU, GALILEO and QZSS are only applicable for this option.

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Values:

0 : Outside of the United States

1 : Worldwide (For test/debug purposes)

AT$GNSSCONF?

Read command returns the currently selected GNSS configuration in the format:

$GNSSCONF: <combination>,<worldwide>

AT$GNSSCONF=?

Test command reports the supported range of values for parameter(s) <**combination**> and <**worldwide**>.

$GNSSCONF: (the supported range of <combination>),(the supported range of <worldwide>)

The <**worldwide**> option isn't supported. It has no effect and is included only for backward compatibility.

If the <**worldwide**> value is 1 (Worldwide) from **$GNSSCONF** setting, Set command returns **ERROR**.

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3.14.3.2. 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 GNSS receiver: validated Ephemeris and Almanac.

Factory Reset performs the same operation as **Coldstart**.

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<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

Preliminary Rev.0

Not Subject to NDA

3.14.3.3. 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:

$GPSLOCK: <mode>

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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.

Preliminary Rev.0

Not Subject to NDA

3.14.3.4. AT$GPSANTPORT - Configuration of GNSS Antenna Port Type

This command is used to configure to control switch between GPS and AUX port.

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

AT$GPSANTPORT=<type>

Set command selects to configure GNSS antenna port type.

Parameter:

Name	Type	Default	Description
<type>	integer	2	Enabled Port type

Values:

0 : Disable GNSS on AUX port and GNSS port. (GNSS off)

1 : Enable GNSS on AUX port and disable GNSS on GNSS port; Internal LNA On, DC-Bias Off. (passive antenna on Aux port)

2 : Enable GNSS on GNSS port and disable GNSS on AUX port; Internal LNA On, DC-Bias Off. (passive antenna on GNSS port)

3 : Enable GNSS on GNSS port and disable GNSS on AUX port; Internal LNA Off, DC-Bias On. (active antenna on GNSS port)

4 : Enable GNSS on GNSS port and disable GNSS on AUX port; Internal LNA On, DC-Bias On. (active antenna on GNSS port)

Additional info:

▶▶ When **AT$GPSANTPORT** setting is **3**:

1.

The target GNSS antenna port (external active antenna gain – Cable loss) should be 7.5 ~ 26dB.

▶▶ When **AT$GPSANTPORT** setting is **4**:

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1.

The target GNSS antenna port (external active antenna gain – Cable loss) should be 1.5 ~ 7.5dB.

2.

This setting should be used only for very long GNSS antenna cable length.

AT$GPSANTPORT?

Read command returns the currently selected port type in the format:

$GPSANTPORT: <type>

AT$GPSANTPORT=?

Test command reports the supported range of values for parameter(s) <**type**>.

$GPSANTPORT: (the supported range of <type>)

Preliminary Rev.0

Not Subject to NDA

3.14.4. GNSS Positioning Information

3.14.4.1. 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 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:

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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
<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

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Not Subject to NDA

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>
  ...

- <**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, it can activate the NMEA unsolicited streaming both the current dedicated port and NMEA port. 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:

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<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>

The storage of **$GPSNMUN** setting value is following,

Setting saved
Auto

The current setting is stored in NVM.

If **#LOCNMEATYPE** command is already used, the user should avoid using this command because this setting have an effect on **#LOCNMEATYPE** operation.

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

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Not Subject to NDA

3.14.4.2. 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>

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

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Not Subject to NDA

The storage of **$GPSNMUNEX** setting value is following,

Setting saved
Auto

The current setting is stored in NVM.

AT$GPSNMUNEX?

Read command returns the NMEA extended sentences availability status, in the format:

$GPSNMUNEX: <GNGNS>,<GNGSA>,<GLGSV>

AT$GPSNMUNEX=?

Test command returns the supported range of values for parameters:

<GNGNS>,<GNGSA>,<GLGSV>

The NMEA extended data is displayed on NMEA port depending on **$GPSNMUN** setting.

If **#LOCNMEATYPE** command is already used, the user should avoid using this command because this setting have an effect on **#LOCNMEATYPE** operation.

AT$GPSNMUNEX=1,0,0

OK

These set the GNGNS as available sentence in the unsolicited message.

AT$GPSNMUNEX?

$GPSNMUNEX: 1,0,0

OK

Give the current frame selected (GNGNS)

The unsolicited message will be:

$GNGNS,010304.00,3731.304375,N,12655.784627,E,AAANA,17,0.8,67.6,18.0,,,V*57

Preliminary Rev.0

Not Subject to NDA

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Not Subject to NDA

3.14.4.3. AT$GPSACP - Get Acquired GNSS Position

This command returns information about the last GNSS position.

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>

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.mmmmmm N/S (referred to GGA sentence) where: dd: 00..90, degrees mm.mmmmmm: 00.000000..59.999999, minutes N/S: North/South
<longitude>	string	-	longitude in the format dddmm.mmmmmm E/W (referred to GGA sentence) where: ddd: 000..180, degrees mm.mmmmmm: 00.000000..59.999999, minutes

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			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)
<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>	integer	N/A	total number of GNSS satellites in use (referred to GNS sentence) Value: 0÷99 : total number of GNSS satellites in use

Preliminary Rev.0

Not Subject to NDA

AT$GPSACP?

Read command has the same behavior as the execution command.

AT$GPSACP=?

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

```
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 no fix GNSS position

```
AT$GPSACP
$GPSACP: ,,,,,1,,,,,,
OK
```

Once fix has been received the command will display actual GNSS position

```
AT$GPSACP
$GPSACP: 002518.000,3731.303660N,12655.781816E,0.8,73.1,3,0.0,0.0,0.0,290819,18
OK
```

Preliminary Rev.0

Not Subject to NDA

3.14.4.4. AT$GNSSTTFF - GNSS TTFF Information

This command gets the GNSS TTFF (Time To First Fix) information.

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

AT$GNSSTTFF

Execution command returns information about the GNSS TTFF in the format:

$GNSSTTFF: <elapsedTime>

where:

<elapsedTime> - Time to First Fix

- Unit: seconds

AT$GNSSTTFF?

Read command has the same function as the Execution command.

AT$GNSSTTFF=?

Test command returns the OK result code.

Whenever a new GNSS session is started, the TTFF information about a first GNSS fix will be updated to new one.

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Not Subject to NDA

- Start GNSS session with Cold Start type. (See **$GPSR**)

AT$GPSR=1

OK

AT$GPSP=1

OK

As soon as a GNSS session is started, the previous GNSS TTFF information is cleared.

AT$GNSSTTFF

$GNSSTFF:

OK

TTFF occurs at 30 seconds.

Query TTFF after 30 seconds from GNSS session.

AT$GNSSTTFF

$GNSSTFF: 30

OK

If a first fix is achieved, and no reacquisitions occurred before the next query, **AT$GNSSTTFF** will return the previous TTFF value. For example, after 50 seconds from the GNSS session,

AT$GNSSTTFF

$GNSSTFF: 30

OK

Stop GNSS session.

AT$GPSP=0

OK

Displays the latest GNSS TTFF information.

AT$GNSSTTFF

$GNSSTFF: 30

OK

Start GNSS session with Warm Start type. (See **$GPSR**)

AT$GPSR=2

OK

AT$GPSP=1

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OK

As soon as a GNSS session is started, the previous GNSS TTFF information is cleared.

AT$GNSSTTFF

$GNSSTFF:

OK

TTFF occurs at 20 seconds.

Query TTFF after 150 seconds from the GNSS session

AT$GNSSTTFF

$GNSSTFF: 20

OK

Stop GNSS session.

AT$GPSP=0

OK

Display the latest GNSS TTFF information.

AT$GNSSTTFF

$GNSSTFF: 20

OK

Start GNSS session with Hot Start type. (See $GPSR)

AT$GPSR=3

OK

AT$GPSP=1

OK

As soon as a GNSS session is started, the previous GNSS TTFF information is cleared.

AT$GNSSTTFF

$GNSSTFF:

OK

TTFF occurs at 1 second.

Measured TTFF after 1 second from GNSS session.

AT$GNSSTTFF

$GNSSTFF: 1

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OK

Stop GNSS session.

AT$GPSP=0

OK

Display the latest GNSS TTFF information.

AT$GNSSTTFF

$GNSSTFF: 1

OK

- Get GNSS TTFF during a GNSS session.

Start a GNSS session with default Reset type. (See **$GPSR**, Hot Start Type).

AT$GPSP=1

OK

As soon as a GNSS session is started, the previous GNSS TTFF information is cleared.

AT$GNSSTTFF

$GNSSTFF:

OK

TTFF occurs at 1 seconds.

Query TTFF after 5 seconds from GNSS session.

AT$GNSSTTFF

$GNSSTFF: 1

OK

Issue a GNSS restart command for Cold Start. (See **$GPSR**)

AT$GPSR=1

OK

As soon as the Cold Start is issued, the previous GNSS TTFF information is cleared.

AT$GNSSTTFF

$GNSSTFF:

OK

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TTFF occurs at 32 seconds.

Query TTFF after 40 seconds from GNSS session.

AT$GNSSTTFF

$GNSSTFF: 32

OK

Stop GNSS Session

AT$GPSP=0

OK

Display the latest GNSS TTFF information.

AT$GNSSTTFF

$GNSSTFF: 32

OK

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3.15. IMS

3.15.1. 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 public user identities are registered with any of its contact addresses, see 3GPP TS 24.229. Values:

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	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:

+CIREG: <mode>,<reg_info>[,<ext_info>]

AT+CIREG=?

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

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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:

- 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 62368-1:2014.

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
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

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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
NMEA	National Marine Electronics Association
NVM	Non-Volatile Memory
PCS	Personal Communication Service
PDP	Packet Data Protocol
PDU	Packet Data Unit
PIN	Personal Identification Number
PPP	Point to Point Protocol
PUK	Pin Unblocking Code
RLP	Radio Link Protocol
RMC	Recommended minimum Specific data
RTS	Request To Send
SAP	SIM Access Profile
SCA	Service Center Address
SMS	Short Message Service
SMSC	Short Message Service Center
SMTP	Simple Mail Transport Protocol
TA	Terminal Adapter
TCP	Transmission Control Protocol
TE	Terminal Equipment
UDP	User Datagram Protocol
USSD	Unstructured Supplementary Service Data
UTC	Coordinated Universal Time

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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
Preliminary	2021-12-20	First issue

From Mod.0818 rev.4

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