

# ME310G1/ME910G1/ML865G1

## AT Commands Reference Guide

80617ST10991A Rev. 15

Software 37.00.xx7/  
M0C.xx0006

2024-05-28

Released

Confidential

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## Applicability Table

Table 1: Applicability Table - Products

Products
ME310G1-W1
ME310G1-WW
ME910G1-W1
ME910G1-WW
ME310G1-W2
ME310G1-W3
ML865G1-WW
ME910G1-W3

Table 2: Applicability Table - Software

Software
37.00.xx7/M0C.xx0006



## Introduction

### Scope

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

### Audience

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

### Contact Information, Support

For technical support and general questions please e-mail:

- [TS-EMEA@telit.com](mailto:TS-EMEA@telit.com)
- [TS-AMERICAS@telit.com](mailto:TS-AMERICAS@telit.com)
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- [TS-SRD@telit.com](mailto:TS-SRD@telit.com)
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Alternatively, use:

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

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

<https://www.telit.com>



## Conventions

### Note:

Provide advice and suggestions that may be useful when integrating the module.

### Danger:

This information **MUST** be followed, or catastrophic equipment failure or personal injury may occur.

### ESD Risk:

Notifies the user to take proper grounding precautions before handling the product.

### Warning:

Alerts the user on important steps about the module integration.



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 advice and suggestions that may be useful when integrating the module.

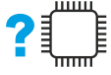


Set: This section provides all information related to SET functionality of the AT command involved. If there is strictly and relevant SET information, it can be found at the end of the section.



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.

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



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## 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.

## 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 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.

## AT Commands 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:
    - 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.

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

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

Moreover:

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

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.

## 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.



## 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 "+"2F2F). They are delimited by semicolon. In the second command the sub parameter is omitted.
- +CMD1?<CR> This is a Read command for checking current sub parameter values
- +CMD1=?<CR> This is a test command for checking possible sub parameter values

### Note:

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

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

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

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

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

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

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



### Note:

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

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

This is NOT a command; it is the error response to +Cxxx 3GPP TS 27.007 commands.

Syntax: +CME ERROR: <err>

Parameter: <err> - error code can be either numeric or 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.

Table 3: ME Error Result Code

Numeric Format	Verbose Format
0	phone failure
1	no connection to phone
2	phone adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure



14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
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
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
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



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
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
1007	SSL cannot activate
1008	SSL not connected
1009	SSL already connected
1010	SSL error enc/dec data
1011	SSL disconnected
1012	SSL version mismatch
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
1150	GTP error timeout
1151	PDP is not active
1152	GTP is Disabled
1153	operation not supported
1154	Reboot failed. Reboot manually

## ME Error Result Code for MQTT - +CMS ERROR: <err>

If MQTT commands are used detailed error codes for possible values of <err> are reported in the following table:

Table 3.1: ME Error Result Code

Numeric Format	Verbose Format
1100	MQTT Initialization Fail
1101	MQTT De-initialization Fail



1102	MQTT Configuration Fail
1103	MQTT Connect Fail
1104	MQTT Disconnect Fail
1105	MQTT Publish Fail
1106	MQTT Subscribe Fail
1107	MQTT Unsubscribe Fail
1108	MQTT SSL Configuration Fail
1109	MQTT Command Timeout Fail
1110	MQTT PUBSEXT Fail
1111	MQTT Protocol Unsupported
1112	MQTT Identifier Rejected
1113	MQTT Server Unavailable
1114	MQTT Bad Username or Password
1115	MQTT Not Authorised
1200	MQTT-SN Initialization Fail
1201	MQTT-SN De-initialization Fail
1202	MQTT-SN Configuration Fail
1203	MQTT-SN Socket Fail
1204	MQTT-SN Connect Fail
1205	MQTT-SN Disconnect Fail
1206	MQTT-SN Register Fail
1207	MQTT-SN Publish Fail
1208	MQTT-SN Subscribe Fail
1209	MQTT-SN Unsubscribe Fail





1210	MQTT-SN Will Topic Update Fail
1211	MQTT-SN Will Message Update Fail
1212	MQTT-SN State Change Fail
1213	MQTT-SN Invalid Client Status

## 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:

Table 4: Message Service Failure Result Code

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

## 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"
```

**Warning:**

```
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"
```

**Warning:**

```
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.

## 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 codes that inform about the progress of the TA operation (e.g. connection establishment CONNECT)



- result codes 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

Table 5: Basic result codes

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

#### Note:

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

## 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.

## Command Issuing Timing

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



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

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

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

## Module Reboot

Reboot of the module can be triggered by AT command. Specific AT commands, to apply the changes requested, do include an implicit reboot. These AT commands are identified by the "This AT command causes a reboot" or "This AT command could cause a reboot" warning box statements in this Guide.

### Warning:

The boot-up time of the module, after issuing any of the AT commands that implicitly trigger a Reboot procedure, could be considerably longer than expected.

Please allow up to 20 seconds for boot up before executing an HW\_SHUTDOWN



## Storage

### 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, #SLEDSAV, #SKTSAV, #ESAV); all these values are read at power-up.

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

Table 6: AT Command short overview table

SIM Presence	Setting saved	Can be aborted
/	see below	/

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

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

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

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

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



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

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

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

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

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

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

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

Examples of the AT commands:

#SLED setting is saved by #SLEDSAV

#BIQUADINEX setting is saved by #PSAV

etc.





## AT Command Short Overview Table

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

Table 7: AT Command short overview table

SIM Presence	Setting saved	Can be aborted
Not required	/	No

Here are the table fields meanings:

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

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



## AT COMMANDS



## Call & DTMF



## AT+CHUP - Hang Up Call

This command cancels all active and held calls



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	No	No



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



Modules supporting the command

ME310G1-

WWV

ME910G1-

WWV

ML865G1-

WW voice



## AT#ECAM - Extended Call Monitoring

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

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



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) 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



<div> <div>Values:</div> <div> <div>0</div> <div>:</div> <div>idle</div> </div> <div> <div>1</div> <div>:</div> <div>calling (MO)</div> </div> <div> <div>2</div> <div>:</div> <div>connecting (MO)</div> </div> <div> <div>3</div> <div>:</div> <div>active</div> </div> <div> <div>6</div> <div>:</div> <div>alerting (MT)</div> </div> <div> <div>7</div> <div>:</div> <div>busy</div> </div> </div>		
<calltype>	integer	<div>call type indicator</div> <div>Value:</div> <div> <div>1</div> <div>:</div> <div>voice</div> </div>
<number>	string	called number (valid only if <ccstatus> is 1)
<type>	string	<div>type of &lt;number&gt;</div> <div>Values:</div> <div> <div>129</div> <div>:</div> <div>national number</div> </div> <div> <div>145</div> <div>:</div> <div>international number</div> </div>



### 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>



#### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## 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
Required	No	No



AT+VTS=<dtmfChar>

Execution command allows the transmission of DTMF tones.

Parameter:

Name	Type	Default	Description
<dtmfChar>	char	-	an ASCII character in the set (0 - 9), #, *, (A-D). It allows the user to send a DTMF tones, with a duration that was defined through +VTD command.



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)



Modules supporting the command





ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



# AT+VTD - Tone Duration

Set command sets the length of tones transmitted with +VTS command.



3GPP TS 27.007  
TIA IS-101

SIM Presence	Setting saved	Can be aborted
Required	Common profile	No



AT+VTD=<duration>

Parameter:

Name	Type	Default	Description
<duration>	integer	0	duration of a tone
<p>Values:</p> <p>0 : the duration of every single tone is dependent on the network</p> <p>1÷255 : duration of every single tone in 10 sec</p>			



AT+VTD?

Read command reports the current Tone Duration, in the format:

<duration>



AT+VTD=?

Test command provides the list of supported <duration>





Modules supporting the command	
ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## General Control and Config



---

## Command Line Prefixes



## 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
Not required	No	No



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.



## 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
Not required	No	No



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 does not need a fixed +IPR.



## AT#/ - Repeat Last Command

The command immediately executes the previously issued command or commands.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#/ 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.





## Generic Modem Control



## AT#SELINT - Select Interface Style

This command sets the AT command interface style.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**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:			
<div> <div>2</div> <div>:</div> <div>standard AT parser</div> </div>			



**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>.



## 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
Not required	No	No



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
<p>Values:</p> <p>0 : only the factory profile base section parameters are considered</p> <p>1 : either the factory profile base section and the extended section are considered (full factory profile)</p>			



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



## ATZ - Soft Reset

### Soft Reset



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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	A	user profile number
Value:			
0,1 : user profile number			



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



Any active call is terminated.



## AT&Y - Default Reset Basic Profile Designation

Basic profile on startup.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



**AT&Y=[<n>]**

Set command defines the basic profile that will be loaded on startup. The wireless module can store 2 complete configurations (see &W).

Parameter:

Name	Type	Default	Description
<n>	integer	0	basic profile that will be loaded on startup.
Value:			
<div> <div>0,1</div> <div>:</div> <div>profile index</div> </div>			



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.



## AT&P - Default Reset Full Profile Designation

Define which full profile is loaded at startup.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT&P[<n>]

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

Parameter:

Name	Type	Default	Description
<n>	integer	0	Configuration parameter
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



## AT&W - Store Current Configuration

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

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT&W[<n>]

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.



## AT&N - Display Internal Phonebook Stored Numbers

The command displays telephone numbers stored in the internal phonebook.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT&N[<n>]

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

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

Parameter:

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



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





## AT#Z - Extended Reset

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

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#Z=<profile>

Parameter:

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



AT#Z=?

Test command returns OK result code.



## 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
Not required	No	No



### 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  :  RLP
MODE
```



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



# AT+GCI - Country of Installation

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



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



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>.



# 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
Not required	No	No



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.



## AT+GMI - Manufacturer Identification

This command returns the manufacturer identification.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+GMI

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



AT+GMI=?

Test command returns OK result code.



## AT+GMM - Model Identification

The command returns the model identification.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+GMM

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



AT+GMM=?

Test command returns OK result code.



# AT+GMR - Revision Identification

The command returns the software revision identification.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+GMR

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



AT+GMR=?

Test command returns OK result code.





## 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
Not required	No	No



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.



# AT+CGMI - Request Manufacturer Identification

The command returns device manufacturer identification code.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CGMI

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



AT+CGMI=?

Test command returns OK result code.



# AT+CGMM - Request Model Identification

This command returns the device model identification.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT+CGMM

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



AT+CGMM=?

Test command returns OK result code.



# AT+CGMR - Request Revision Identification

The command returns device software revision number.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CGMR

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



AT+CGMR=?

Test command returns OK result code.



## 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
Not required	No	No



### AT+CGSN

Execution command returns the product serial number in form of IMEI of the mobile followed by an OK at newline.

Additional info:

►► The IMEI is composed of the following elements (each element shall consist of decimal digits only):

1. Type Allocation Code (TAC). Its length is 8 digits
2. Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits
3. Luhn Check Digit. Its length is 1 digit



### AT+CGSN=?

Test command returns OK result code.



## AT#CGMI - Request Manufacturer Identification

The command returns device manufacturer identification code.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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.



## AT#CGMR - Request Revision Identification

The command returns device software revision number.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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.



## AT#CGSN - Product Serial Number Identification

The execution command returns the product serial number, in form of IMEI of the mobile, with #CGSN: command echo.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#CGSN

The command returns the following message:

AT#CGSN

#CGSN: <product serial number>

OK

Additional info:



The IMEI is composed of the following elements (each element shall consist of decimal digits only):

1. Type Allocation Code (TAC). Its length is 8 digits
2. Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits
3. Luhn Check Digit. Its length is 1 digit



### AT#CGSN=?

The test command returns the OK result code.





## AT#CGMF - Request Product Code

Execution command returns the device product code without #CGMF: command echo.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#CGMF

The command returns the following message:

AT#CGMF  
<productCode>

OK



AT#CGMF=?

Test command returns OK result code.



## AT#SWPKGV - Request Software Package Version

This command shows the software, modem, production, application packages versions. It provides two syntax formats: set and execution.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#SWPKGV=<version>

Here is the set format.

Parameter:

Name	Type	Default	Description
<version>	string	A	selects the type of version to be shown; it must be entered between double quotes
Values:			
M	:	shows modem version	
A	:	shows App version	
P	:	shows Production version	
PK	:	shows the full package version	

Additional info:

- ▶▶ The execution format returns the packages versions without #SWPKGV: command echo. The response is as follows:

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

OK





AT#SWPKGv=?

Test command returns OK result code.



# 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
Not required	No	No



AT+CPAS

Additional info:

►► Message format returned by the execution command:

+CPAS: <pas>

Name	Type	Default	Description
<pas>	integer	0	phone activity status.
<p>Values:</p> <p>0 : ready (device allows commands from TA/TE)</p> <p>3 : ringing (device is ready for commands from TA/TE, but the ringer is active)</p> <p>4 : call in progress (device is ready for commands from TA/TE, but a call is in progress)</p>			





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.



## 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
Not required	Specific profile	No



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

Set command selects the level of functionality in the ME.

Parameters:

Name	Type	Default	Description
<fun>	integer	1	Power saving function mode.
Values:			
0 : NON-CYCLIC SLEEP mode, see Additional info section			
1 : mobile full functionality with power saving disabled			
2 : disable TX, not supported			
4 : disable both TX and RX			
5 : push the module in power saving, see Additional info section			
6 : module reboot			
7 : OFF line mode. This mode cannot be set, can only be read using the read command.			



8 : FTM. This mode cannot be set, can only be read using the read command. .....			
<rst>	integer	0	reset flag
Values: ..... 0 : do not reset the ME before setting it to <fun> functionality level.  1 : reset the ME before setting it to <fun> functionality level, this option works only with <fun> =1, with other it will return an error .....			

#### Additional info:

##### ►► <fun>=0

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





##### ►► <fun>=5

To place the module in power saving mode set <fun>= 5 and the DTR line to OFF. Once in power saving, the CTS line switch to the OFF status to signal that the module is really in power saving condition.

During the power saving condition, before sending any AT command on the serial line, the DTR line must be set to ON to exit from power saving and it must be waited for the CTS line to go in ON status.

Until the DTR line is ON, the module will not return in the power saving condition.



-  Issuing AT+CFUN=4[,0] causes the module to perform either a network deregistration and a SIM deactivation.
-  If power saving is enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity.
-  The power saving function does not affect the network behavior of the module, even during the power save condition the module remains registered on the network and reachable for incoming calls or SMS. If a call incomes during the power save, then the module will wake up and proceed normally with the unsolicited incoming call code.
-  When using the RTS line toggle to exit NON-CYCLIC SLEEP mode (<fun>=0), the new line level must be held stable for a minimum period of 2 seconds.



#### AT+CFUN?

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

+CFUN: <fun>



#### AT+CFUN=?

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



This AT command could cause a reboot





## 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
Not required	Specific profile	No



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:			
.....			
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.



#### 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)



## AT+CSVM - Set Voice Mail Number

Command to set voice mail server number.

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



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	-	string type 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>`



`AT+CSVM=?`

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



## AT#MBN - Mailbox Numbers

This command returns the mailbox numbers stored on SIM.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



### AT#MBN

Execution command returns the mailbox numbers stored on SIM, if this service is provided by the SIM.

The response is in the format:

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

Additional info:

►► The response has its fields described below.

Name	Type	Default	Description
<index>	integer	-	record number
<number>	string	-	string type mailbox number in the format <type>
<type>	integer	A	type of mailbox number octet in integer format
Values: <div>             .....             <div>               129 : national numbering scheme             </div> <div>               145 : international numbering scheme (contains the character "+")             </div>             .....           </div>			
<text>	string	-	the alphanumeric text associated to the number; used character set should be the one selected with command +CSCS



	<div>&lt;mboxtype&gt;   string   A   the message waiting group type of the mailbox, if available</div>
	<div>Values:<div><div>VOICE    </div></div></div>



## AT#MWI - Message Waiting Indication

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

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



**AT#MWI=[<enable>]**

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

Parameter:

Name	Type	Default	Description
<enable>	integer	1	enables/disables the presentation of the #MWI: URC
<p>Values:</p> <p>0 : disables the presentation of the #MWI: URC</p> <p>1 : enables the presentation of the #MWI: URC, see Additional info.</p>			

Additional info:

- ▶▶ If AT#MWI=1 has been entered, the #MWI: URC is displayed each time
    - a new message waiting indicator is received from the network, the URC format is:  
#MWI: <status>,<indicator>[,<count>]
    - the module is powered on, the URC reports the status of the message waiting indicators, as they are currently stored on SIM, the format is:  
#MWI: <status>[,<indicator>[,<count>]][<CR><LF>  
#MWI: <status>,<indicator>[,<count>][...]]
- The parameters are described in the unsolicited fields section for each URC format.

Unsolicited fields:





Name	Type	Description
<status>	integer	<p>indicates clear or set action when it is received from the network.</p> <p>Values:</p> <p>0 : clear: has been deleted one of the messages related to the indicator &lt;indicator&gt;.</p> <p>1 : set: there is a new waiting message related to the indicator &lt;indicator&gt;</p>
<status>	integer	<p>indicates the status when it is read from SIM.</p> <p>Values:</p> <p>0 : no waiting message indicator is currently set. In this case no other information is reported.</p> <p>1 : there are waiting messages related to the message waiting indicator &lt;indicator&gt;</p>
<indicator>	integer	<p>message indicator has the same meaning regardless if it comes from network or it is read from SIM.</p> <p>Values:</p> <p>1 : either Line 1 (CPHS context) or Voice (3GPP context)</p> <p>2 : Line 2 (CPHS context only)</p> <p>3 : Fax</p> <p>4 : E-mail</p> <p>5 : Other</p>
<count>	integer	<p>network information reporting the number of pending messages related to the message waiting indicator &lt;indicator&gt;.</p>



<count>      integer      number of pending messages related to the message waiting indicator <indicator> as it is stored on SIM



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



### AT#MWI?

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

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

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



### AT#MWI=?

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



## AT+CLAC - Available AT Commands

This command shows the available AT commands list.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	No	No



### 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.



# AT#LANG - Select Language

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

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#LANG=<lan>

Parameter:

Name	Type	Default	Description
<lan>	string	en	Selected language
Values:			
.....			
en		:	English
it		:	Italian
.....			



AT#LANG?

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

#LANG: <lan>



AT#LANG=?

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



## 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
Not required	Specific profile	No



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	enables/disables +CME ERROR: <err> result code and selects the format
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.



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>.



## AT#CEER - Extended Numeric Error Report

The command is related to extended numeric error report.



3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT#CEER

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

#CEER: <code>

which offers the user of the TA a report of the reason for

- the last unsuccessful GPRS attach or unsuccessful PDP context activation;
- the last GPRS detach or PDP context deactivation.

Additional info:

►► Intermediate response parameters:

Name	Type	Default	Description
<code>	integer	-	error code. Table below show the error codes range and the related meanings.



## ▶▶ Error codes table

Value	Diagnostic
0	No error
31	Normal, unspecified
	GPRS related errors
224	MS requested detach
225	NWK requested detach
226	Unsuccessful attach cause NO SERVICE
227	Unsuccessful attach cause NO ACCESS
228	Unsuccessful attach cause GPRS SERVICE REFUSED
229	PDP deactivation requested by NWK
230	PDP deactivation cause LLC link activation Failed
231	PDP deactivation cause NWK reactivation with same TI
232	PDP deactivation cause GMM abort
233	PDP deactivation cause LLC or SNDSCP failure
234	PDP unsuccessful activation cause GMM error
235	PDP unsuccessful activation cause NWK reject
236	PDP unsuccessful activation cause NO NSAPI available
237	PDP unsuccessful activation cause SM refuse





238	PDP unsuccessful activation cause MMI ignore
239	PDP unsuccessful activation cause Nb Max Session Reach
256	PDP unsuccessful activation cause wrong APN
257	PDP unsuccessful activation cause unknown PDP address or type
258	PDP unsuccessful activation cause service not supported
259	PDP unsuccessful activation cause QOS not accepted
260	PDP unsuccessful activation cause socket error



If none of the previous conditions has occurred since power up, then <code>=0 is reported (i.e. No error, see table above)



AT#CEER=?

Test command returns OK result code.



## AT#HWREV - Hardware Identification

This command returns the device Hardware revision identification code.

SIM Presence	Setting saved	Can be aborted
Not Required	No	No



### AT#HWREV

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



### AT#HWREV?

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



### AT#HWREV=?

Test command returns the OK result code.



## AT#PSMRI - Power Saving Mode Ring Indicator

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

SIM Presence	Setting saved	Can be aborted
Required	Common profile	No



AT#PSMRI=<n>

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

Parameter:

Name	Type	Default	Description
<n>	integer	0	disables, enables/sets duration of the generated pulse.
Values:			
.....			
0	:	disables RI pin response for URC message	
50÷1150	:	enables RI pin response for URC messages with a duration specified in ms	
.....			



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



The behavior for #PSMRI is invoked only when modem is in sleep mode AT+CFUN=5.



AT#PSMRI?

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

#PSMRI: <n>





AT#PSMRI=?

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



The value set by command is stored in the profile extended section and doesn't depend on the specific AT instance used to enter the command.



## AT+CSCS - Select TE Character Set

The command purpose is to set different character sets that are used by the device.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No





AT+CSCS=[<chset>]

Set command sets the current character set used by the device.

Parameter:

Name	Type	Default	Description
<chset>	string	IRA	character set to be used by the device.
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).	
HEX	:	Character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done. If MT is using GSM 7 bit default alphabet, its characters shall be padded with 8th bit (zero) before converting	



	<p>them to hexadecimal numbers (i.e. no SMS style packing of 7 bit alphabet).</p>
	<p><b>AT+CSCS?</b></p> <p>Read command returns the current value of the active character set.</p>
	<p><b>AT+CSCS=?</b></p> <p>Test command returns the supported values for parameter &lt;chset&gt;.</p>

# AT+CMUX - Multiplexing Mode

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



3GPP TS 27.007  
3GPP TS 27.010

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CMUX=<mode>[,<subset>[,<port\_speed>[,<N1>]]]


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


Parameters:

Name	Type	Default	Description
<mode>	integer	0	basic option is currently the only supported mode.
Value: <div> 0 : basic option mode. </div>			
<subset>	integer	0	the way in which the multiplexer control channel is set up
Value: <div> 0 : UIH frame </div>			



<port_speed>	integer	N/A	transmission rate. The default value is implementation specific.
<div>Values:<div><div>1</div><div>:</div><div>9600 bps</div></div><div>2</div><div>:</div><div>19200 bps</div><div>3</div><div>:</div><div>38400 bps</div><div>4</div><div>:</div><div>57600 bps</div><div>5</div><div>:</div><div>115200 bps</div><div>6</div><div>:</div><div>230400 bps</div></div>			
<N1>	integer	122	maximum frame size.
<div>Value:<div><div>1÷1500</div><div>:</div><div>expressed in bytes</div></div></div>			

 **AT+CMUX?**  
Read command returns the current value of the parameters, in the format:  
+CMUX: <mode>,<subset>,<port\_speed>,<N1>

 **AT+CMUX=?**  
Test command returns the range of supported values for all parameters.





## AT#USBCFG - USB Configuration

This command sets USB configuration on the modem device.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#USBCFG=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	USB configuration mode. See #PORTCFG command.
Values:			
0 : USB Modem Ports, 1 Diag Port, 1 WWAN network adapter (no data traffic); VID 0x1BC7 PID 0x110A			
3 : USB Modem Ports, 1 Diag Port, 1 ECM network adapter; VID 0x1BC7 PID 0x110B			
50 : No Ports available (security setting)			



To make active the configuration the module must be rebooted.



Once the setting #USBCFG=50 is applied, it will no longer be possible to give other AT commands on the USB Modem ports.

Therefore, if you want to make the setting reversible by giving the AT#USBCFG command again, you need to be sure that you have other AT instances available, such as an UART port (see #PORTCFG) or a virtual port accessible from an AppZone application .



**AT#USBCFG?**

Read command returns the current <mode> in the following format:

#USBCFG: <mode>

**AT#USBCFG=?**

Test command returns the list of supported values.



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

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



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#PORTCFG=<Variant>

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

Parameter:

Name	Type	Default	Description
<Variant>	integer	0	set port configuration. A short description, for each <Variant> value, is reported in test command section. The range depends on the product.
Value:			
0÷max : see test command section			



To enable the set port configuration, the module must be rebooted.



AT#PORTCFG?

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

#PORTCFG: <requested>,<active>

Additional info:



►► Parameters returned by the read command, in format:  
#PORTCFG: <requested>,<active>

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



#### AT#PORTCFG=?

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

For each <Variant> are reported, on one row, the logical connections between a physical port (USIF0, USB0, etc.) and a Service Access Point (AT#1, AT#2, etc.). Each row reports the logical connections available in two configurations: USB cable plugged or not plugged in. To have information about the physical ports, refer to document [1].

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

For ME310G1 family modules:

AT#PORTCFG=?

#PORTCFG: Variant=0: AT= USIF0 USB0 USB1

#PORTCFG: Variant=3: AT= USIF0 AUX USB0

#PORTCFG: Variant=8: AT= USB0 USB1

#PORTCFG: Variant=13: AT= USIF0 USB0

OK

For ME910G1 family modules and ML865G1 module:

AT#PORTCFG=?

#PORTCFG: Variant=0: AT= USIF0 USB0 USB1

#PORTCFG: Variant=3: AT= USIF0 USIF1 USB0

#PORTCFG: Variant=8: AT= USB0 USB1

#PORTCFG: Variant=13: AT= USIF0 USB0

OK

The <Variant> range depends on the product.



## AT#ATDELAY - AT Command Delay

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

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#ATDELAY=<delay>

Parameter:

Name	Type	Default	Description
<delay>	integer	0	delay interval
Value: <div> 0÷max : delay expressed in 100 milliseconds intervals; 0 means no delay. For max value refer to test command </div>			



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



AT#ATDELAY=?

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



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



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



## AT#CMAR - Selective Master Reset

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

SIM Presence	Setting saved	Can be aborted
Not required	No	No



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

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

Parameters:

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



- ✦ If parameter <resetType> is omitted, the command has the same behavior as AT#CMAR=0,0
- ✦ This command will just reset user files in "/mod" directory for AP AppZone file system.
- ✦ After the execution is done, the module will automatically reboot.



AT#CMAR=?

Test command returns the <unused> and <resetType> values.





## 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
Not required	No	No



### AT&Z<n>=<nr>

The module has a built in non-volatile memory where 10 telephone numbers can be stored, each one having a maximum of 24 digits. Execution command stores the telephone number <nr> in the record <n>. The records cannot be overwritten; they must be cleared before rewriting.

Parameters:

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



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.



## AT&V2 - Display Last Connection Statistics

The command displays last connection statistics.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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
```



## AT+IMEISV - Request IMEI and Software Version

Execution command returns the International Mobile Station Equipment Identity and Software Version Number (IMEISV) of the module without +IMEISV: command echo.



3GPP TS 23.003

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT+IMEISV

The command returns the following message:

AT+IMEISV  
<IMEISV>

OK

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.



## AT#CGMM - Request Model Identification

This command returns the device model identification.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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.



## AT&V0 - Display Current Configuration and Profile

The command displays current modem configuration and profile.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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.



## AT#FWSWITCH - Set Active Firmware Image

Set command allows enabling a specific firmware image on products embedding 2 or more different firmware images.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#FWSWITCH=<imageNumber>[,<storageConf>[,<restoreUserSettings>]]

Parameters:

Name	Type	Default	Description
<imageNumber>	integer	-	To know the <imageNumber> values range refer to the test command.
<storageConf>	integer	1	selects storage type
Value: <div> 1 : save the &lt;imageNumber&gt; value in NVM, only this selection is available </div>			
<restoreUserSettings>	integer	0	restore user settings for enabled firmware image
Values: <div> 0 : after firmware switch, all settings are returned to default </div>			



1 : after firmware switch, user settings are restored

Additional info:

►► <imageNumber> identifies the image (customization) as shown in the following table.

Product	Customization	<image Number> default value
MEx10G1-W1	0 = AT&T, 1 = Verizon, 2 = ROW, 101 = AT&T Mexico	2
MEx10G1-W3	0 = AT&T, 1 = Verizon, 2 = W3, 3 = AU, 101 = AT&T Mexico	2
MEx10G1-WW	0 = AT&T, 1 = Verizon, 2 = ROW, 3 = AU, 101 = AT&T Mexico	2
ML865G1-WW	0 = AT&T, 101 = AT&T Mexico	0



This AT command performs two system reboots. All the parameters are set to the factory values.

Here are two customization examples: AT#FWSWITCH=0 and AT#FWSWITCH=1. In both cases it is mandatory to follow these steps.

AT&T customization:



1. enter: AT#FWSWITCH=0
2. wait first system reboot
3. wait second system reboot
4. enter: AT#IOTBND=252582047,1048578,2058,0
5. enter: AT#REBOOT
6. wait: system reboot

now, the module is ready to operate

Verizon customization:

1. enter: AT#FWSWITCH=1
2. wait first system reboot
3. wait second system reboot
4. enter: AT#REBOOT
5. wait: system reboot

now, the module is ready to operate



AT#FWSWITCH?

Read command reports the current active firmware image:

#FWSWITCH: <imageNumber>



AT#FWSWITCH=?

Test command reports the range of supported values for parameters <imageNumber>, <storageConf>, <restoreUserSettings>



This AT command causes a reboot







Switch to image 1:

```
AT#FWSWITCH =1
```

```
OK
```



## AT#IMSPDPSET - IMS PDP APN Number Set

This command sets IMS Pdp APN Name. This name should be one of the APN names set in +CGDCONT command and appropriated context will be opened for IMS.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#IMSPDPSET=<pdpApnName>

Parameter:

Name	Type	Default	Description
<pdpApnName>	string	-	from 1 to 32 symbols ANSI fixed string. It can be used with or without quotes



AT#IMSPDPSET?

Read command reports the current setting of string parameter <pdpApnName>, in the format:

#IMSPDPSET: <pdpApnName>



If the file containing the setting is not present in EFS, read command returns an error:

AT#IMSPDPSET?

+CME ERROR: Unable to read the nv file

The file must be created by the set command.



AT#IMSPDPSET=?

Test command returns the maximum length for string parameter <pdpApnName>.



## AT#TID - Request Telit ID

The command returns Telit ID and version number.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#TID

Execution command returns device Telit ID and version number separated by a comma, followed by an OK at newline.



### AT#TID=?

Test command returns OK result code.



---

## S Parameters



## 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
Not required	Specific profile	No



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: <div> <div>0 : auto answer disabled</div> <div>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.</div> </div>			



Data only products ignore command setting and auto answer is disabled if incoming call is a voice call.



ATS0?

Read command returns the current value of S0 parameter.



## 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
Not required	Specific profile	No



ATS1



The form ATS1 has no effect, returns OK result code.



ATS1?

Read command returns S1 value.



## ATS2 - Escape Character

The command manages the ASCII character used as escape character.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



**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:			
0÷255 : 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).



**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.



## 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
Not required	Specific profile	No



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:			
<div> <div>0÷127</div> <div>:</div> <div>command line termination character</div> </div>			



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



## 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
Not required	Specific profile	No



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.



## 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
Not required	Specific profile	No



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:			
<div> <div>0÷127</div> <div>:</div> <div>command line editing character</div> </div>			



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.



## 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
Not required	Specific profile	No



ATS7=<tout>

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.



## ATS12 - Escaper Prompt Delay

The command manages the prompt delay between two different escape characters.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



### ATS12=<time>

Set command sets:

1. the minimum period, before receipt of the first character of the three escape character sequence, during which no other character has to be detected in order to accept it as valid first character;
2. the maximum period allowed between receipt of first or second character of the three escape character sequence and receipt of the next;
3. the minimum period, after receipt of the last character of the three escape character sequence, during which no other character has to be detected in order to accept the escape sequence as a valid one.

Parameter:

Name	Type	Default	Description
<time>	integer	50	delay expressed in fiftieth of a second
Value:			
2÷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



## 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
Not required	Specific profile	No



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.



## AT&V1 - S Registers Display

The command displays the S registers values.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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





## ATS10 - Carrier Off with Firm Time

The command is available only for backward compatibility

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



ATS10=<n>

Execution command has no effect and is available only for backward compatibility with landline modems.

Parameter:

Name	Type	Default	Description
<n>	integer	A	dummy
Value:			
<div> <div>1÷255</div> <div>:</div> <div>dummy parameter</div> </div>			



## AT&V3 - Extended S Registers Display

The command displays the extended S registers values.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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



## DTE - Modem Interface Control



## 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
Not required	Specific profile	No



ATE[<n>]

The execution command allows to enable/disable the command echo.

Parameter:

Name	Type	Default	Description
<n>	integer	1	Configuration value
<p>Values:</p> <p>0 : disables command echo</p> <p>1 : enables command echo, hence command sent to the device are echoed back to the DTE before the response is given.</p>			



If parameter is omitted, the command has the same behavior of ATE0



## ATQ - Quiet Result Codes

This command allows to enable or disable the result code.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



ATQ[<n>]

Set command enables or disables the result codes.

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables result codes
Values:			
0 : enables result codes			
1 : disables result codes. The commands entered after ATQ1 do not return the result code.			
2 : disables result codes (only for backward compatibility). The commands entered after ATQ2 do not return the result code.			



If parameter is omitted, the command has the same behavior of ATQ0.



After issuing ATQ0 the OK result code is returned  
 AT+CGACT=?  
 +CGACT: (0-1)  
 OK



After issuing ATQ1 or ATQ2 the OK result code is not returned.  
AT+CGACT=?  
+CGACT: (0-1)



## ATV - Response Format

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]).



[1] ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



ATV[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	1	format of information responses and result codes. See Additional info section.
Values:			
<div> <div>0</div> <div>:</div> <div>limited headers and trailers and numeric format of result codes</div> </div>			
<div> <div>1</div> <div>:</div> <div>full headers and trailers and verbose format of result codes</div> </div>			

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>

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





## ATI - Identification Information

This command returns identification information.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



ATI[<n>]

Execution command returns one or more lines of information text followed by a result code.

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 ATIO



## AT&C - Data Carrier Detect (DCD) Control

This set command controls the DCD output behavior of the AT commands serial port.



ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT&C[<n>]

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



## AT&D - Data Terminal Ready (DTR) Control

This set command configures the behavior of the module according to the DTR control line transitions (RS232).

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No

AT&D[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	defines the module behavior according to the DTR control line transitions

Values:

- 0 : module ignores DTR control line transitions
- 1 : when the module is connected, the high to low transition of DTR line sets the module in command mode, the current connection is not closed
- 2 : when the module is connected, the high to low transition of DTR line sets the module in command mode and the current connection is closed
- 3 : C108/1 operation is enabled
- 4 : C108/1 operation is disabled



If AT&D2 has been issued, and the DTR line has been tied Low, auto-answering is inhibited and it is possible to answer only issuing command ATA.



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



## AT&K - Flow Control

Flow Control settings.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



### AT&K[<n>]

Set command controls the serial port flow control behavior.

Parameter:

Name	Type	Default	Description
<n>	integer	0	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.



## AT&S - Data Set Ready (DSR) Control

Set DSR pin behavior.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



### AT&S[<n>]

Set command controls the RS232 DSR pin behavior.

Parameter:

Name	Type	Default	Description
<n>	integer	3	Configuration parameter
Values:			
0 : always High			
1 : DSR is tied High when the device receives from the network the GSM traffic channel indication			
2 : High when connected			
3 : High when device is ready to receive commands			



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



In power saving mode the DSR pin is always tied Low.



# AT+IPR - UART DCE Interface Data Rate Speed

The command sets the speed of the USIF0 serial port, see document [1].



- [1] Hardware Design Guide of the used module
- [2] ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT+IPR=<rate>

The command sets the UART speed of the USIF0 port during command mode operations.  
Parameter:

Name	Type	Default	Description
<rate>	integer	115200	speed of the serial USIF0 port expressed in bit per second.
Values:			
<hr/>			
300		:	bps
600		:	bps
1200		:	bps
2400		:	bps
4800		:	bps
9600		:	bps
19200		:	bps
38400		:	bps



```

57600           : bps
115200          : bps
230400          : bps
460800          : bps
921600          : bps
.....

```



#### AT+IPR?

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



#### AT+IPR=?

Test command returns the list of <rate> values in the format:

+IPR: (list of <rate> values)



This command has no effect if it is sent on USB interface or CMUX instances: the DCE sends the OK result but the settings are ignored.



#### Test command example

AT+IPR=?

+IPR:

(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600)

OK



## AT#DTR - Data Terminal Ready (DTR) flow control

The command configures how the outbound flow on serial ports is controlled by the DTR signal, see document [1]



[1] Hardware Design Guide of the used module

[2] ITU-T Recommendation V25 ter

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT#DTR=<n>

This set command configures the behavior of the outbound flow according to the DTR control line level transitions.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	DTR outbound flow control behavior
Values:			
<p>0 : DTR level transitions are ignored and cannot control the outbound data flow. (Supported only by UART ports).</p> <p>1 : DTR level transitions control the outbound data flow. If DTR is asserted, the output data is sent; if DTR is not asserted, the output data is blocked. (Supported only by ports with DTR signal)</p>			





2 : Like setting 1, but receiving input data has the same effect of a low to high level transition. Therefore, if the DTR is not asserted, or if it is asserted but its level has not been signaled by the DTE to the DCE, after receiving input data the DTR is considered asserted. A new DTR level transition from asserted to not asserted will block again the outbound flow. (Supported only by USB ports)

Additional info:

- ▶▶ For USIF ports default value of <n> is 0.
- ▶▶ For USB ports default value of <n> is 2.
- ▶▶ The range depends on the port.



AT#DTR?

Read command returns the current value of <n> parameter.



AT#DTR=?

Test command returns the list of <n> values in the format:

#DTR: (list of <n> values)



This command returns only the <n> values supported by the port on which it is given; i.e. USB ports do not support <n>=0; USIF ports without DTR pin only support <n>=0.



Test command example



AT#DTR=?

#DTR: (0,1)

OK



## 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
Not required	Specific profile	No



AT+IFC=<byDTE>,<byDCE>

Parameters:

Name	Type	Default	Description
<byDTE>	integer	0	specifies the method used by the DTE to control the flow of data received from the device (DCE)
Values: <div> <div>0 : no flow control</div> <div>2 : flow control by RTS control line (C105, Request to Send)</div> </div>			
<byDCE>	integer	0	specifies the method used by the device (DCE) to control the flow of data received from the DTE
Values: <div> <div>0 : no flow control</div> <div>2 : flow control by CTS control line (C105, Clear to Send)</div> </div>			





The only possible commands are AT+IFC=0,0 and AT+IFC=2,2.



AT+IFC?

Read command returns active flow control settings.



AT+IFC=?

Test command returns all supported values of the parameters <byDTE> and <byDCE>.



## AT+ICF - DTE-Modem Character Framing

This set command defines the asynchronous character framing.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT+ICF=<format>[,<parity>]

Parameters:

Name	Type	Default	Description
<format>	string	3	sets the number of Data bits and Stop bits. Only the <format>=3 is supported.
Value:			
<div> <div>3</div> <div>:</div> <div>8 Data, 1 Stop</div> </div>			
<parity>	string	0	setting this sub parameter has no meaning.
Values:			
<div>0</div> <div>:</div> <div>odd, not supported</div>			
<div>1</div> <div>:</div> <div>even, not supported</div>			



AT+ICF?

Read command returns current settings for parameters <format> and <parity>. The setting of parameter <parity> is always 0.



AT+ICF=?

Test command returns the ranges of values for the parameters <format> and <parity>.



```
</> AT+ICF=3
OK
AT+ICF=?
+ICF: (3),(0,1)
OK
```



## AT#CFLO - Command Flow Control

This set command enables/disables the hardware flow control in command mode. If enabled, the flow control is applied to both data mode and command mode

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT#CFLO=<enable>

Parameter:

Name	Type	Default	Description
<enable>	integer	1	enable/disable hardware flow control
Values: <div> <div>0 : disable flow control in command mode</div> <div>1 : enable flow control in command mode</div> </div>			



Setting value is saved in the profile.



The flow control in online mode is not affected by this command. See AT&K command for the flow control in online mode.



AT#CFLO?

Read command returns current setting value in the format:



#CFLO: <enable>



AT#CFLO=?

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





## AT#SKIPESC - Skip Escape Sequence

This command enables/disables skipping the escape sequence.

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



**AT#SKIPESC=[<mode>]**

Set command enables/disables skipping the escape sequence (+++) while transmitting during a data connection.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable skipping the escape sequence (+++)
<p>Values:</p> <p>0 : does not skip the escape sequence; its transmission is enabled.</p> <p>1 : skips the escape sequence; its transmission is not enabled.</p>			



In FTP connection the escape sequence is not transmitted, regardless of the command setting.



**AT#SKIPESC?**

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

#SKIPESC: <mode>



**AT#SKIPESC=?**

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



## AT#SETHEXSTR - Enable Input of Hex Coded Characters in String Constants

This command allows the module to accept hexadecimal coded characters input in string constants.

SIM Presence	Setting saved	Can be aborted
Not required	No	No

AT#SETHEXSTR=<mode>

Set command enables/disables the hexadecimal coded characters input style, depending on the <mode> parameter.

If enabled, hexadecimal characters are accepted as input when preceded by a backslash character and enclosed in double quotes.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable input in hexadecimal format
<p>Values:</p> <p>0 : input of hexadecimal coded characters is disabled</p> <p>2 : input of hexadecimal coded characters is enabled. Each string constant containing a hexadecimal coded character must be enclosed between double-quotes. This is not mandatory if the string constant does not contain any hexadecimal coded character.</p>			

AT#SETHEXSTR?

Read command reports the current <mode> setting in the format:

#SETHEXSTR: <mode>

AT#SETHEXSTR=?

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

#SETHEXSTR: (0,2)





**WARNING:** Only printable ASCII characters (range 0x20-0x7E) are translated. All other characters are not translated but passed through as they are.

For example, writing "\0D" in an ATcommand, "\0D" will be found in the final string, it will neither be translated nor modified.



**WARNING:** Only for #MQWCFG command, the accepted hexadecimal codes have been expanded to all ASCII table (range 0x00 - 0x7F).

For example, writing "\0D" in AT#MQWCFG=1,1,0,0,willmsg,"\0D" the hexadecimal value '0D' will be found on the last will message.



```
AT#SETHEXSTR=0
OK
AT+CGDCONT=1,"IP","nb\69ot.tids.tim.it"
OK
AT+CGDCONT=1,"IP","nb\69ot.tids.tim.it"
ERROR
AT#MQPUBS=1,Topic,1,1,"{"MAC","98430+01"}"
ERROR
AT#SETHEXSTR=2
OK
AT+CGDCONT=1,"IP","nb\69ot.tids.tim.it"
OK
AT+CGDCONT=1,"IP","nb\69ot.tids.tim.it"
OK
AT#MQPUBS=1,Topic,1,1,"{"MAC","98430+01"}"
ERROR
AT#MQPUBS=1,Topic,1,1,"{\22MAC\22,\2298430+01\22}"
OK
```



## AT#E2ESC - Escape Sequence Guard Time

This set command sets a guard time in seconds for the escape sequence in PS to be considered a valid one, and return to on-line command mode.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#E2ESC=[<gt>]

Parameter:

Name	Type	Default	Description
<gt;	string	0	sets a guard time in seconds
Values:			
.....			
0	:	guard time is defined by S12 command	
1÷10	:	guard time in seconds. It overrides the one set with S12 command	
.....			



AT#E2ESC?

Read command returns current value of the escape sequence guard time, in the format:

#E2ESC: <gt>



AT#E2ESC=?

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



## ATX - Extended Result Codes

Set command selects the subset of result code messages the modem uses to reply to the DTE upon AT commands execution.



ITU-T Recommendation V.25 ter

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



ATX[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	1	configuration value
Values:			
<div> <div>0</div> <div>:</div> <div>when entering in dial mode a CONNECT result code is relayed; see Additional info.</div> </div>			
<div> <div>1÷4</div> <div>:</div> <div>when entering in dial mode a CONNECT &lt;text&gt; result code is relayed, see Additional info.</div> </div>			

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.



$\langle n \rangle = 1 \div 4$   
all the remaining result codes are enabled.



When the  $\langle n \rangle$  parameter is omitted, the command acts like ATX0.



## Call (Voice and Data) Control



## ATD - Dialup Connection

This command establishes a GPRS communication between the TE and the external PDN, or starts a voice call to a given phone number.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	No	Yes



### ATD

The ATD execution command assumes the format shown in Additional info section. It causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN or to start a voice call to a given phone number.

Additional info:

►► ATD<number>;

Execution command starts a voice call to the phone number given as parameter.

Name	Type	Default	Description
<number>	mixed	-	phone number to be dialed. The numbers accepted are 0-9 and '*', '#', 'A', 'B', 'C', 'D', '+', 'P', ','.

►► ATD><str>;

issues a call to phone number which corresponding alphanumeric field is <str>; all available memories will be searched for the correct entry.





Name	Type	Default	Description
<str>	string	-	alphanumeric field corresponding to phone number; it must be enclosed in quotation marks.  Parameter <str> is case sensitive.

## ►► ATD><mem><n>;

Issues a call to phone number in phonebook memory storage <mem>, entry location <n>. Available memories may be queried with +CPBS=? command.

Name	Type	Default	Description
<mem>	string	N/A	phonebook memory storage; it must not be enclosed in quotation marks
Values: <div> <div>SM : SIM phonebook</div> <div>FD : SIM fixed dialing-phonebook</div> <div>LD : SIM last-dialing-phonebook</div> <div>MC : device missed (unanswered received) calls list</div> <div>RC : ME received calls list</div> </div>			
<n>	integer	-	entry location; it should be in the range of locations available in the memory used.

## ►► ATD><n>;



issues a call to phone number in entry location <n> of the active phonebook memory storage, see +CPBS command.

Name	Type	Default	Description
<n>	integer	-	active phonebook memory storage entry location; it should be in the range of locations available in the active phonebook memory storage.

## ►► ATDL

issues a call to the last number dialed.

## ►► ATDS=<nr>;

issues a call to the number stored in the module internal phonebook position number <nr>.

Name	Type	Default	Description
<nr>	integer	-	internal phonebook position to be called, see commands &N and &Z

## ►► ATD\*<gprs\_sc>[\*[<addr>][\*[<L2P>][\*[<cid>]]]]#

Name	Type	Default	Description
<gprs_sc>	integer	N/A	is the GPRS Service Code, which identifies a request to use the GPRS communication
Value:			



99 : GPRS Service Code			
<addr>	string	-	identifies the called party in the address space applicable to the PDP.
<L2P>	string	-	indicates the layer 2 protocol to be used (see +CGDATA). For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used: 1 is equivalent to PPP.
<cid>	integer	-	PDP context definition, see +CGDCONT command



## ATA - Answer Incoming call

Execution 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
Required	No	No



ATA



This command must be the last in the command line and must be followed immediately by a <CR> character.



### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## 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
Not required	No	No



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.



## 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
Not required	No	No



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.



## AT#ATDCECHECK - ATD CE Level Check

AT command used to check CAT-M1 CE level before starting a VoLTE call

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#ATDCECHECK=<enable>

Execution command enables/disables checking of CAT-M1 CE Mode A level before starting a VoLTE call; if check is enabled, VoLTE calls will not be attempted when CE level is 1. There is nothing in the standards that prevents the UE from setting up a VoLTE call while in CE mode, but in Level 1 it will fail: the network will try to allocate resources and set up the call, but the link will not support a bearer with the required throughput and latency requirements for VoLTE, so even if the call setup succeeds, voice will be unintelligible, and the link will eventually fail (drop).

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enables/disables checking of CAT-M1 CE Mode A level
Values:			
.....			
0	:	disable check	
1	:	enable check	
.....			



AT#ATDCECHECK?

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

#ATDCECHECK: <enable>





AT#ATDCECHECK=?

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



#### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice





## AT#DIALMODE - Set Dialing Mode

Set command manages dialing modality.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#DIALMODE=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	sets dialing modality
Values:			
.....			
0	:	OK result code is received as soon as it starts remotely ringing.	
1	:	OK result code is received only after the called party answers.	
2	:	see Additional info section.	
.....			

Additional info:



<mode>=2

The following custom result codes are received, monitoring step by step the call status:

DIALING, MO in progress

RINGING, remote ring

CONNECTED, remote call accepted



RELEASED, after ATH  
DISCONNECTED, remote hang-up



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>.



Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



---

## Modulation & Compression Control



## AT%E - Line Quality and Auto Retrain

This command is used for line quality monitoring and auto retrain or fall back/fall forward.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT%E[<n>]

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

Parameter:

Name	Type	Default	Description
<n>	integer	-	this parameter is not really used, and it is present only for backward compatibility



If <n> parameter is not specified, the default value is considered



# Network



## AT+CNUM - Subscriber Number

Execution 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
Required	No	No



### AT+CNUM

Execution command returns the MSISDN (if the phone number of the device has been stored in the SIM card) using 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

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



AT+CNUM=?

Test command returns the OK result code.



## AT+COPN - Read Operator Names

This command read operator names.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



### AT+COPN

Execution command returns the list of operator names from the ME in the format:

+COPN: <numeric1>,<alpha1>[<CR>

+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.



### AT+COPN=?

Test command returns the OK result code.





## 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
Not required	Specific profile	No



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: short 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



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: <div> 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 </div>
<lac>	string	the parameter reports: Local Area Code when <AcT>=0 Tracking Area Code when <AcT>=8 or 9
<ci>	string	Cell Id for the currently registered on cell
<AcT>	integer	access technology of the registered network Values: <div> 0 : GSM </div>



8	:	CAT M1
9	:	NB IoT



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



### AT+CREG?

Read command returns the current value of <mode>, the registration status <stat>, and the network information (<lac>, <ci> and <AcT>) according to the used <mode> parameter value.

+CREG: <mode>,<stat>[,<lac>,<ci>[,<AcT>]]

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



### AT+CREG=?

Test command returns supported values for parameter <mode>.



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



## 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
Required	Auto	No



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. User re-selection according to 3GPP TS 23.122 is performed; to change search algorithm, use AT#UPLMNSEL command			
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			



<p>4 : manual/automatic, &lt;oper&gt; parameter must be present. If manual selection fails, the module will try automatic mode (&lt;mode&gt;=0)</p> <p>.....</p>			
<format>	integer	0	specifies the operator name format, see <oper> parameter
<p>Values:</p> <p>.....</p> <p>0 : alphanumeric long form (max length 16 digits)</p> <p>1 : alphanumeric short form</p> <p>2 : numeric 5 or 6 digits [country code (3) + network code (2 or 3)]</p> <p>.....</p>			
<oper>	mixed	-	network operator in format defined by <format> parameter
<act>	integer	N/A	selects access technology.
<p>Values:</p> <p>.....</p> <p>0 : GSM</p> <p>8 : CAT M1</p> <p>9 : NB IoT</p> <p>.....</p>			

 <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.



## AT+COPS?

Read command returns current value of <mode>, <format>, <oper> and <AcT> in format <format>. If no operator is selected, <format>, <oper> and <AcT> are omitted.

+COPS: <mode>[, <format>, <oper>,< act>]

If the module is deregistered, <format>, <oper>, and <act> parameters are omitted.



## 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.



## AT+CLCK - Facility Lock/Unlock

This command is used to lock or unlock a ME on a network facility.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CLCK=<fac>,<mode>[,<password>[,<class>]]

Set command is used to lock, unlock or interrogate a modem or a network lock facility. Password is normally needed to do such actions

Parameters:

Name	Type	Default	Description
<fac>	string	N/A	facility to lock, unlock or interrogate
Values: <div>             "SC" : SIM (PIN request) (device asks SIM password at power-up and when this lock command issued)           </div> <div>             "FD" : SIM fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as &lt;passwd&gt;)           </div>			
<mode>	integer	N/A	defines the operation to be done on the facility
Values:			





<div> <div>0 : unlock facility</div> <div>1 : lock facility</div> <div>2 : query status</div> </div>			
<password>	string	-	shall be the same as password specified for the facility from the DTE user interface or with command Change Password +CPWD
<class>	integer	N/A	is a sum of integers, each representing an information class of which the command refers to; default is 7 (voice + data + fax).
<div> <div>Values:</div> <div> <div>1 : voice (telephony)</div> <div>2 : data (refers to all bearer services)</div> <div>4 : fax (facsimile services) (not supported by LTE)</div> <div>8 : short message service</div> <div>16 : data circuit sync</div> <div>32 : data circuit async</div> <div>64 : dedicated packet access</div> <div>128 : dedicated PAD access</div> </div> </div>			

Additional info:

►► When <mode>=2 and command is successful, it returns:



+CLCK: <status>

Name	Type	Default	Description
<status>	integer	N/A	the current status of the facility
Values:			
.....			
0	:	not active	
1	:	active	
.....			



AT+CLCK=?  
Test command reports all the facilities supported by the device.



## AT+CPWD - Change Facility Password

This command changes the password for the facility lock function defined by command Facility Lock +CLCK command.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Other	Yes



AT+CPWD=<fac>,<oldpwd>,<newpwd>

Execution command changes the password for the facility lock function defined by command Facility Lock +CLCK command.

Parameters:

Name	Type	Default	Description
<fac>	string	N/A	facility lock function.
Values: <div> "SC" : SIM (PIN request) </div> <div> "P2" : SIM PIN2 </div>			
<oldpwd>	string	it shall be the same as password specified for the facility from the ME user interface or with command +CPWD.	
<newpwd>	string	-	new password.





Parameter <oldpwd> is the old password while <newpwd> is the new one.



The password can be changed only if PIN request is enabled (see +CLCK command).



AT+CPWD=?

Test command returns a list of pairs (<fac>,<pwdlength>) which represents the available facilities and the maximum length of their password (<pwdlength>).



MAX timeout indicates the time within which the command must be executed. MAX timeout for this command is 180 s.



## 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
Required	Specific profile	No



**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 that allows a calling subscriber to enable or disable the presentation of the Calling Line Identification to the called party when originating a call.

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)			
.....			





This command sets the default behavior of the device in all outgoing calls.



## AT+CLIR?

Read command gives the default adjustment for all outgoing calls (<n>) and also triggers an interrogation of the provision status of the CLIR service (<m>), in the form

+CLIR: <n>,<m>

Additional info:



Parameters:

Name	Type	Default	Description
<n>	integer	0	facility status in the Mobile
Values: <div>             0 : CLIR facility according to CLIR service network status             1 : CLIR facility active (CLI not sent)             2 : CLIR facility not active (CLI sent)           </div>			
<m>	integer	N/A	facility status in the Network
Values: <div>             0 : CLIR service not provisioned             1 : CLIR service provisioned permanently           </div>			



- 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>



#### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



# 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
Required	No	No



## AT+CLCC

Execution command returns the list of current calls and their characteristics in the format:

```
[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[<CR><LF>
+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>[...]]]
```

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

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

9 : unknown

<mpty>	integer	N/A	multiparty call flag
--------	---------	-----	----------------------

Values:

0 : call is not one of multiparty (conference) call parties



📌 If no call is active then only OK message is sent.

## Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



# AT+CPOL - Preferred Operator List

The command is used to edit or update the UICC preferred list of networks. The list is read in the UICC file selected by the command +CPLS.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CPOL=[<index>] [,<format>[,<oper>[,<GSM\_AcT>,<GSM\_Compact\_AcT>,<UTRAN\_AcT>,<E\_UTRAN\_AcTn>]]]

Execution command writes an entry in the UICC list of preferred operators.

Parameters:

Name	Type	Default	Description
<index>	integer	N/A	the order number of operator in the UICC preferred operator list.
Value:			
1÷n : order number in the list			
<format>	integer	2	format for <oper> parameter.
Value:			
2 : numeric. Only 2 is allowed up to now			






<oper>	string	-	Operator Identifier.
<GSM_AcT>	integer	N/A	GSM access technology.
Values: ..... 0 : access technology not selected 1 : access technology selected .....			
<GSM_Compact_AcT>	integer	N/A	GSM compact access technology. Currently the parameter is not supported but set value is accepted.
Values: ..... 0 : access technology not selected 1 : access technology selected .....			
<UTRAN_AcT>	integer	N/A	UTRAN access technology. Currently the parameter is not supported but set value is accepted.
Values: ..... 0 : access technology not selected 1 : access technology selected .....			
<E_UTRAN_AcTn>	integer	N/A	E-UTRAN access technology



#### Values:

0 : access technology not selected

1 : access technology selected

-  If <index> is used, and <oper> is not entered, the entry is deleted from the list of preferred operators.
-  If <oper> is used, and <index> is not used, <oper> is put in the next free location.
-  If only <format> is entered, the format of the <oper> in the read command is changed.



AT+CPOL?

Read command returns all used entries from the UICC list of preferred operators.



AT+CPOL=?

Test command returns the <index> range supported by the UICC and the range for the <format> parameter.



Entry 3 in the preferred list of the operators is deleted.

AT+CPOL=3

OK

Operator identifier 22603 is inserted in the next free location of the list.

AT+CPOL=,2,22603

OK



Format of <oper> in the read command is changed (only 2 is allowed up to now).  
AT+CPOL=,2  
OK

Operator Identifier 22603 is inserted in the 4th position of the list.  
AT+CPOL=4,2,22603  
OK

Available range for <index> is 1 to 20, for <format>= 2.  
AT+CPOL=?  
+CPOL: (1-20),(2)



## 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
Required	Auto	No



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.



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.



# AT+CSQ - Signal Quality

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



- [1] 3GPP TS 27.007
- [2] 3GPP TS 07.07
- [3] 3GPP TS 25.133

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CSQ  
See Additional info sections.  
Additional info:

▶▶ 2G Networks

The execution command returns the following message:  
+CSQ: <rss>,<ber>

Name	Type	Default	Description
<rss>	integer	N/A	measurements of the radio signal power, expressed in dBm, are mapped to <rss> as shown below
Values:			
<div> <div>0</div> <div>:</div> <div>-113 dBm or less</div> </div>			



1	:	-111 dBm
2÷30	:	-109 dBm ... -53 dBm; 2 dBm per step
31	:	-51 dBm or greater
99	:	not known or not detectable

<ber>	integer	N/A	measurements of the channel bit error rate, expressed in %, are mapped to <ber> as shown below
-------	---------	-----	--

Values:

0	:	less than 0.2%
1	:	0.2% to 0.4%
2	:	0.4% to 0.8%
3	:	0.8% to 1.6%
4	:	1.6% to 3.2%
5	:	3.2% to 6.4%
6	:	6.4% to 12.8%
7	:	more than 12.8%
99	:	not known or not detectable

►► 4G Networks



The execution command returns the following message:

+CSQ: <rssi>,<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: <div><div>0</div><div>:</div><div>-113 dBm or less</div></div> <div><div>1</div><div>:</div><div>-111 dBm</div></div> <div><div>2÷30</div><div>:</div><div>-109...-53 dBm</div></div> <div><div>31</div><div>:</div><div>- 51 dBm or greater</div></div> <div><div>99</div><div>:</div><div>not known or not detectable</div></div>			
<rsrq>	integer	N/A	Reference Signal Received Quality. For <rsrq> levels are mapped to range 0...7.
Values: <div><div>0</div><div>:</div><div>-4...-3 dB</div></div> <div><div>1</div><div>:</div><div>-6...-5 dB</div></div>			



2	:	-8...-7 dB
3	:	-10...-9 dB
4	:	-13...-11 dB
5	:	-15...-14 dB
6	:	-17...-16 dB
7	:	-19...-18 dB
99	:	not known or not detectable



AT+CSQ=?

Test command returns values supported as compound values.



## AT#SERVINFO - Serving Cell Information

This command reports information about the serving cell.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#SERVINFO

Execution command reports information about serving cell. The information and the format of the returned message depends on the network type.

#### GSM network

```
#SERVINFO:<BARFCN>,<dBm>,  
[<NetNameAsc>],<NetCode>,<BSIC>,<LAC>,<TA>,<GPRS>[, [<PBARFCN>],  
[<NOM>],<RAC>,[PAT]]
```

#### LTE network

```
#SERVINFO:<EARFCN>,<dBm>,  
[<NetNameAsc>],<NetCode>,<PhysicalCellId>,<TAC>,<DRX>,<SD>,<RSRP>
```

The parameters are described in the Additional info sections.

Additional info:

#### Parameters meaning.

Name	Type	Default	Description
<dBm>	integer	-	received signal strength in dBm.
<NetNameAsc>	string	-	operator name, quoted string or "" if network name is unknown.
<NetCode>	hex	-	country code and operator code.



<LAC>	integer	-	Localization Area Code
<BSIC>	string	-	Base Station Identification Code
<TA>	integer	-	Time Advance: it is available only if a GSM or GPRS is running.
<GPRS>	integer	0	GPRS supported in the cell
Values: ..... 0          : not supported 1          : supported .....			
<BARFCN>	integer	-	BCCH ARFCN of the serving cell

►► Parameters meaning.

Name	Type	Default	Description
<NOM>	string	N/A	Network Operator Mode.
Values: ..... I          : Network Mode I II         : Network Mode II III         : Network Mode III .....			



<RAC>	integer	-	Routing Area Color Code.
-------	---------	---	--------------------------

## Parameters meaning.

Name	Type	Default	Description
<DRX>	integer	-	Discontinuous reception cycle length.
<SD>	integer	N/A	Service Domain
Values: <div>             0 : No Service             1 : CS only             2 : PS only             3 : CS &amp; PS             4 : MS found the right system, but it is not registered or attached yet           </div>			
<RSCP>	integer	-	Received Signal Code Power in dBm.
<EARFCN>	integer	-	LTE Assigned Radio Channel
<PhysicalCellId>	integer	-	Physical Cell ID
<TAC>	integer	-	Tracking Area Code
<RSRP>	integer	-	Reference Signal Received Power





►► Parameters meaning.

Name	Type	Default	Description
<PBARFCN>	integer	-	Not supported by 3GPP. PBCCH ARFCN of the serving cell; it is printed only if PBCCH is supported by the cell, otherwise the label "hopping" will be printed
<PAT>	integer	N/A	Priority Access Threshold.
Values: <div> <div>0 : Priority Access Threshold</div> <div>3÷6 : Priority Access Threshold</div> </div>			



AT#SERVINFO=?

Test command returns OK result code.



## AT#BCCHLOCK - Lock to Single BCCH ARFCN

This command enables/disable the single BCCH ARFCN locking.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#BCCHLOCK=<LockedBcch>[,<LockedUarfcn>[,<LockedPsc>[,<LockedEarfcn>[,<LockedPci>]]]]

This command allows to set the single BCCH ARFCN (also UARFCN and EARFCN) the device must be locked to, selectable within those allowed for the specific product.

Parameters:

Name	Type	Default	Description
<LockedBcch>	integer	1024	enable/disable 2G BCCH locking
Value:			
1024 : disable			
<LockedUarfcn>	integer	0	enable/disable 3G BCCH locking
Value:			
0 : disable			
<LockedPsc>	integer	65535	enable/disable 3G BCCH locking Primary Scrambling Code selection
Value:			
65535 : disable			



<code>&lt;LockedEarfcn&gt;</code>	integer	0	a number representing the earfcn to be locked. If <code>&lt;LockedPci&gt;</code> is FFFF, this value must be 0
-----------------------------------	---------	---	--

Value:

0÷70545 : enable lock on downlink EARFCN in LTE bands (some values are not supported according to product band configuration).

<code>&lt;LockedPci&gt;</code>	hex	FFFF	E-UTRAN physical cell ID in hexadecimal format. Valid range 0 - 1F7. The value FFFF will remove the lock.
--------------------------------	-----	------	---

Values:

0÷1F7 : physical cell id

FFFF : disable



The values set by command are directly stored in NVM. The lock feature is effective at the next attach. Reboot is required for unlock function and when the lock is set on a different cell than the current one.



**AT#BCCHLOCK?**

Read command reports the currently stored parameters in the format:

#BCCHLOCK:

`<LockedBcch>,<LockedUarfcn>,<LockedPsc>,<LockedEarfcn>,<LockedPci>`



**AT#BCCHLOCK=?**

Test command reports the supported range of values for parameter:

`<LockedBcch>,<LockedUarfcn>,<LockedPsc>,<LockedEarfcn>` and `<LockedPci>`



## AT#NWEN - Network Emergency Number Update

This command enables the unsolicited result code of emergency number update.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT#NWEN=[<en>]

Set command enables/disables the URC for emergency number update. The URC format is:

#NWEN: <type>

The parameter is described in the Unsolicited field section.




Parameter:

Name	Type	Default	Description
<en>	integer	0	enables/disables unsolicited indication of emergency number update
Values:			
.....			
0		:	disable
1		:	enable
.....			

Unsolicited field:

Name	Type	Description
<type>	integer	unsolicited indication of emergency number update
Values:		
.....		
1	:	number list update from internal ME
2	:	number list update from SIM



	<p>3 : number list update from network</p> <hr/> <p> Entering AT#NWEN= returns OK but has no effect.</p> <hr/>
	<p>AT#NWEN?</p> <p>Read command reports whether the unsolicited indication of network emergency number update is currently enabled or not, in the format:</p> <p>#NWEN: &lt;en&gt;</p>
	<p>AT#NWEN=?</p> <p>Test command reports the range for the parameter &lt;en&gt;</p>

## AT#PLMNUPDATE - Update PLMN List

This set command adds a new entry, or updates an already present one, in the module PLMN list stored in file system.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#PLMNUPDATE[<action>,<MCC>,<MNC>[,<PLMNname>]]

Parameters:

Name	Type	Default	Description
<action>	integer	0	remove/update PLMN list items
Values: <div> <div>0 : remove the entry with selected &lt;MCC&gt; and &lt;MNC&gt;. Parameter &lt;PLMNname&gt; is ignored</div> <div>1 : update the entry with selected &lt;MCC&gt; and &lt;MNC&gt; if it is already present, otherwise add it</div> </div>			
<MCC>	integer	-	Mobile Country Code
<MNC>	integer	-	Mobile Network Code
<PLMNname>	string	-	name of the PLMN; string value, max length 30 characters.



#PLMNUPDATE command is accepted only if #PLMNMODE is set to 2.



AT#PLMNUPDATE?

Read command returns the list of entries added or updated with set command, in the format:

#PLMNUPDATE: <MCC>,<MNC>,<PLMNname>

#PLMNUPDATE: <MCC>,<MNC>,<PLMNname>



...  
OK

The entries are listed in increasing order by MCC and MNC.



AT#PLMNUPDATE=?

Test command returns the range of <action> parameter and the maximum length of <MCC>, <MNC> and <PLMNname> parameters.



## AT#PLMNMODE - PLMN List Selection

Set command is used to select the list of operator names to be used in +COPN command, and in internal researches for operator name matching given MCC and MNC.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#PLMNMODE=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	1	list of operator names to be used for internal search
Values:			
.....			
1	:	internal hard coded list	
2	:	list is retrieved from a file in the file system	
.....			



AT#PLMNMODE?

Read command reports whether the currently used list of PLMN names is fixed or not, in the format:

#PLMNMODE: <mode>



AT#PLMNMODE=?

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





## AT#PLMNSI - PLMN Selection Indication

This command indicates if modem has to prioritize the previously selected network instead of the home network, if the USIM does not specify that on file EF\_LRPLMNSI (cases where the USIM does not define service 74 then the EF\_LRPLMNSI is not present).



3GPP TS 23.122

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#PLMNSI=<plmn\_si>

Set command writes PLMN Selection Indication in NV EFSnv/item\_files/modem/nas/reg\_nv\_items.

The set value is processed after modem reboot

Parameter:

Name	Type	Default	Description
<plmn_si>	integer	N/A	PLMN Selection Indication
Values:			
<p>0 : The UE shall attempt registration on the Last RPLMN at switch-on or recovery from out-of-coverage as described in TS 23.122</p> <p>1 : The UE shall attempt registration on the HPLMN at switch-on or recovery from out-of-coverage as described in TS 23.122</p>			



**AT#PLMNSI?**

Read command reads PLMN Selection Indication if it is stored in NV, otherwise returns ERROR

#PLMNSI: <plmn\_si>

**AT#PLMNSI=?**

Test command reports the supported range of values for parameter <plmn\_si>

#PLMNSI: (0,1)



## AT#FPLMN - Periodical FPLMN Cleaning

Periodically delete the Forbidden PLMN list stored inside the SIM card, clear it or list it.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#FPLMN=<action>[,<period>]**

The set command is used to manage the Forbidden PLMN List file (FPLMN) stored in the SIM card.

Parameters:

Name	Type	Default	Description
<action>	integer	0	kind of action for FPLMN file
Values: <div> <div>0 : disable periodic FPLMN cleaning</div> <div>1 : enable periodic FPLMN cleaning with period &lt;period&gt;</div> <div>2 : clear FPLMN file contents (one shot)</div> <div>3 : list contents of FPLMN file</div> </div>			
<period>	integer	60	interval in minutes for FPLMN clearing
Value: <div> <div>1÷60 : interval in minutes</div> </div>			



**AT#FPLMN?**

Read command reports whether the periodic deletion is currently enabled or not, and the deletion period, in the format:



#FPLMN: <action>,<period>



AT#FPLMN=?

Test command reports available values for parameters <action> and <period>



## AT#EPLMNCLEAR - Clear Equivalent PLMN List

This command clears the Equivalent PLMN list.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#EPLMNCLEAR

This command clears the Equivalent PLMN list by setting:

- Length to 0.
- RPLMN and PLMN identities to the default value 0xFF.



This command is global and clears the full list.



### AT#EPLMNCLEAR?

Read command returns 0 if the EPLMN list is empty, hence if the list length is 0.

It returns 1 if the EPLMN list is not empty, hence if the list length is higher than 0.

#EPLMNCLEAR: <n>



## AT#UPLMNSEL - User PLMN reselection handling

User PLMN reselection setting.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No

AT#UPLMNSEL=<enable>

Set command controls the PLMN prioritization mechanism after a network full scan started by AT+COPS=0.

If home network is not available, and device is roaming in a situation where two or more roaming networks are available, if RPLMN is not in the preferred networks list each AT+COPS=0 command will make the device to swap registration between the networks, putting every time the RPLMN at the end of internal list of selectable networks.

This is the "User reselection" procedure described in 3GPP TS 23.122.

To avoid this swapping and always make registration to same network, <enable> should be set to 1.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	User PLMN reselection enabled/disabled
Values:			
.....			
0	:	User PLMN reselection enabled	
1	:	User PLMN reselection disabled	
.....			

AT#UPLMNSEL?

Read command returns current <enable> setting in the the format:

#UPLMNSEL: <enable>

AT#UPLMNSEL=?



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



## AT#BND - Select Band

This command selects RF bands

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#BND=<band>[,<UMTS\_band>[,<LTE\_band>  
[,<TDSCDMA\_band>[,<LTE\_band\_over\_64>]]]]

Set command selects the current GSM and LTE (CAT-M and NB-IoT) bands. CAT-M and NB-IoT bands are set to the same <LTE\_band> and <LTE\_band\_over\_64> values.

If NB-IoT bands need to be differently set from CAT-M bands, e.g. NB-IoT has higher bands than CAT-M, then #IOTBND command has to be used to set NB-IoT bands.

Parameters:

Name	Type	Default	Description						
<band>	integer	-	GSM band selection.						
For 4G only products:									
<table><tr><td>&lt;band&gt;</td><td>/</td></tr><tr><td>0</td><td>dummy parameter</td></tr></table>				<band>	/	0	dummy parameter		
<band>	/								
0	dummy parameter								
For 4G/2G products supporting GSM 900 MHz, DCS 1800 MHz, PCS 1900 MHz and GSM 850 MHz:									
<table><tr><td>&lt;band&gt;</td><td>GSM bands</td></tr><tr><td>0</td><td>GSM 900MHz + DCS 1800MHz</td></tr><tr><td>1</td><td>GSM 900MHz + PCS 1900MHz</td></tr></table>				<band>	GSM bands	0	GSM 900MHz + DCS 1800MHz	1	GSM 900MHz + PCS 1900MHz
<band>	GSM bands								
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 900MHz + DCS 1800MHz + PCS 1900MHz + GSM 850MHz

<UMTS\_band>      integer    0      this parameter is used for backward compatibility.

Value:

.....  
0    :    for both 4G only and 4G/2G products.  
.....

<LTE\_band>      integer    N/A      indicates the LTE supported bands expressed as the sum of Band number (1+2+8 ...) calculated as shown in the table (mask of 32 bits):

Band number	Band i
1	B1
2	B2
4	B3
8	B4
...	...
(2exp(i-1))	Bi



...	...
2147483648	B32

Value:

.....  
1÷4294967295 : range of the sum of Band  
number (1+2+8 ...)  
.....

<TDSCDMA\_band> integer 0 this parameter is used for  
backward compatibility

Value:

.....  
0 : for both 4G only and 4G/2G products  
.....

<LTE\_band\_over\_64> integer N/A indicates the LTE high supported  
bands expressed as the sum of  
Band number (1+2+8 ...)  
calculated as shown in the table  
(mask of 32 bits):

Band number	Band i
1	B65
2	B66
4	B67
8	B68
...	...
(2exp(i-64-1))	Bi
...	...



#### Values:

0 : no high band selected

1÷4294967295 : range of the sum of Band number (1+2+8 ...)

 The command needs a reboot to be effective.



#### AT#BND?

Read command returns the current selected bands in the format:

#BND: <band>,<UMTS\_band>,<LTE\_band>,< TDSCDMA\_band>,< LTE\_band\_over\_64>



#### AT#BND=?

Test command returns the supported range of values of parameters <band>,<UMTS\_band>,<LTE\_band>,< TDSCDMA\_band> and < LTE\_band\_over\_64>.



Test command

AT#BND=?

#BND: (0-5),(0),(1-252655775),(0),(0,2-1048642)

OK

Read command

AT#BND?

#BND: 5,0,252655775,0,1048642

OK



## AT#BNDPRIEXT - Band Priority Setting

Set command configures the CAT-M1 and NB-IoT bands scanning priority in dedicated EFS file.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#BNDPRIEXT=<high\_priority\_bands\_CATM>[,<high\_priority\_bands\_NB>]

Parameters:

Name	Type	Default	Description
<high_priority_bands_CATM>	string	-	hexadecimal string indicating a sequence of maximum 43 bands, each one two bytes long; a special value of 0 is used to indicate that file must be deleted
<high_priority_bands_NB>	string	-	hexadecimal string indicating a sequence of maximum 43 bands, each one two bytes long; a special value of 0 is used to indicate that file must be deleted



Command needs a reboot to be effective.



AT#BNDPRIEXT?

Read command returns the current parameters setting for #BNDPRIEXT command in the format:

#BNDPRIEXT: <high\_priority\_bands\_CATM>,<high\_priority\_bands\_NB>



AT#BNDPRIEXT=?

Test command returns OK result code.





## Examples of #BNDPRIEXT usage

- AT#BNDPRIEXT=0C0004000200,0C0004000200  
OK
- AT#BNDPRIEXT=0,0C0004000200  
OK
- AT#BNDPRIEXT=0C0004000200,0  
OK
- AT#BNDPRIEXT=0,0  
OK



## AT#AUTOBND - Automatic Band Selection

This command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#AUTOBND=[<value>]

Parameter:

Name	Type	Default	Description
<value>	integer	0	only for backward compatibility.
Values:			
.....			
0	:	only for backward compatibility.	
1	:	only for backward compatibility.	
2	:	only for backward compatibility.	
.....			



AT#AUTOBND?

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

#AUTOBND: <value>



AT#AUTOBND=?

Test command returns the supported values for parameter <value>.



## AT#ATUNERSEL - Select Antenna Tuner

This command allows to select the antenna tuner driver.



Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#ATUNERSEL=<driver>

Set command selects the antenna tuner driver.

Parameter:

Name	Type	Default	Description
<driver>	integer	0	Identifies one of the possible antenna tuner driver.
Values:			
<div> <div>0</div> <div>:</div> <div>GPIO with fixed configuration (default) - 2 O to select 4 output bands status combination. (See table in Additional info).</div> </div>			
<div> <div>1</div> <div>:</div> <div>MIPI with QAT3516 + AE910 Antenna Tuner Product . See #BNDTUNER command for further details about antenna tuner configuration.</div> </div>			

Additional info:

►► Table for <driver> = 0



ATC1	ATC2	Band (Uplink)	Freq. Range (MHz)
0	0	B1, B2, B3, B4, B25, B66, GSM1800, GSM1900	1710-2200
0	1	B8, EGSM900	880-960
1	0	B5, B18, B19, B20, B26, B27, GSM850	791-894
1	1	B12, B13, B28, B85	698-803



The command reboots the module to make the change effective.



#### AT#ATUNERSEL?

Read command reports the currently selected aperture antenna tuning driver selection, in the format:

#ATUNERSEL: <driver>



#### AT#ATUNERSEL=?

Test command reports the range for the parameter <driver>.



#### Modules supporting the command

ME310G1-	WW
ME310G1-	W1





ME910G1-	WW
ME910G1-	W1
ML865G1-	WW



This AT command causes a reboot



# AT#BNDTUNER - Antenna Tuner Configuration

This command set antenna tuner configuration on selected band. Reboot is required to be effective. Command is supported only by a subset of modules when AT#ATUNERSEL=1 is available and set



Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#BNDTUNER=<TunerType>,<DeviceId>,<Band>,<TuneCode>  
[,<Unused1>[,<Unused2>[,<Unused3>]]]

Parameters:

Name	Type	Default	Description
<TunerType>	integer	0	Select the tuner under configuration. Allowed valued depends on specific hardware
Values: <div> <div>0 : Default</div> <div>1 : Antenna Tuner QAT3516</div> </div>			
<DeviceId>	integer	0	Hardware identifier to detect device on Hardware. Allowed value depends on specific hardware
Value:			



<div> 0 : Only identifier 0 is currently allowed </div>		
<Band>	integer -	Band under tuning. To know the range, see #BND command.
<TuneCode>	string -	String containing Hex Value used to configure the antenna tuner. Size of the string and constraints depend on specific tuner (see Additional info)
<Unused1>	integer -	Reserved for future use
<Unused2>	integer -	Reserved for future use
<Unused3>	integer -	Reserved for future use

#### Additional info:

##### ►► TuneCode configuration:

QAT3516: it requires a 4-char string which contains 2 byte value in HEX format (i.e.: "E1080")

Following QAT3516 constraints, the string has this general representation: "xx8y" where:

Value x can assume any Hex value from 0 to F

Value y can assume only value from 0 to 3



#### AT#BNDTUNER?

Read command reports the current settings of parameters, in the format:

#BNDTUNER: <Band>,<DeviceId>,<TuneCode>

#BNDTUNER: <Band>,<DeviceId>,<TuneCode>

#BNDTUNER: <Band>,<DeviceId>,<TuneCode>

...





AT#BNDTUNER=?

Test command reports the supported range of the parameters' values



#### Modules supporting the command

ME310G1-	WW
ME310G1-	W1
ME910G1-	WW
ME910G1-	W1
ML865G1-	WW



Set command: Tuning LTE band B2 by setting value "E180" to tuner QAT3516 connected on ID=0

```
AT#BNDTUNER=1,0,2,"E180"
```

OK

Set command: Tuning GSM band 900 by setting value "D280" to tuner QAT3516 connected on ID=0

```
AT#BNDTUNER=1,0,900,"D280"
```

OK

Test command: any GSM band are allowed

```
AT#BND?
```

```
#BND 5,0,252582047,0,1048578
```

```
AT#BNDTUNER=?
```



```
#BNDTUNER: (1),(0),  
(1,2,3,4,5,8,12,13,18,19,20,25,26,27,28,66,85,850,900,1800,1900),4,(0),(0),(0)
```

Test command: only 900 and 1800 GSM band are allowed

```
AT#BND=0
```

OK

```
AT#BND?
```

```
#BND 0,0,252582047,0,1048578
```

```
AT#BNDTUNER=?
```

```
#BNDTUNER: (1),(0),(1,2,3,4,5,8,12,13,18,19,20,25,26,27,28,66,85,900,1800),4,(0),  
(0),(0)
```

OK



## AT#SNUM - Subscriber Number

This set command writes the MSISDN information related to the subscriber (own number) in the EFmsisdn SIM file.



3GPP TS 51.011

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#SNUM=<index>[,<number>[,<alpha>]]

Parameters:

Name	Type	Default	Description
<index>	integer	-	the number of the record in the EFmsisdn file in SIM where the number must be stored; its range goes from 1 to a maximum value that varies from SIM to SIM. If only <index> value is given, then the EFmsisdn record in location <index> is deleted.
<number>	string	-	string containing the phone number
<alpha>	string	-	alphanumeric string associated to <number>; its maximum length varies from SIM to SIM. Default value is empty string (""), otherwise the used character set should be the one selected with +CSCS. The string could be written between quotes; the number of characters depends on the SIM. If empty string is given (""), the corresponding <alpha> will be an empty string.



The command returns ERROR if EFmsisdn file is not present in the SIM, or if MSISDN service is not allocated and activated in the SIM Service Table, see 3GPP TS 51.011.



AT#SNUM=?



Test command returns the OK result code



## AT#CODECINFO - Codec Information

This command returns information about the channels codecs.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**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: <div>             .....             <div>               0 : numeric format, see info section             </div> <div>               1 : textual format, see info section             </div> </div> .....			
<mode>	integer	0	enable/disable unsolicited channels codecs information
Values: <div>             .....             <div>               0 : enable unsolicited channels codecs information             </div> <div>               1 : disable unsolicited channels codecs information             </div> </div> .....			





- |   |   |
|---|---|
| 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 |

#### 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 depends on the <format> parameter value.

- Execution command (AT#CODECINFO<CR>) returns immediately channels codecs information according to the previous setting of <format> parameter.

if <format>=0, the return message is:

#CODECINFO: <codec\_used>,<codec\_set>

if <format>=1, the return message is:

#CODECINFO: <codec\_used>,<codec\_set1>[,<codec\_set2>[..`codec_setn`]]]

The parameters and their format is described in the Unsolicited code values section.



Unsolicited fields:

Name	Type	Description
<codec_used>	string	<format>=0, <codec_used> is displayed in numeric format Values:
		0 : no TCH
		1 : full rate speech 1 on TCH
		2 : full rate speech 2 on TCH
		4 : half rate speech 1 on TCH
		8 : full rate speech 3 – AMR on TCH
		16 : half rate speech 3 – AMR on TCH
		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

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



### AT#CODECINFO?

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

#CODECINFO: <format>,<mode>



### AT#CODECINFO=?

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



#### Modules supporting the command

Modules supporting the command	
ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## AT#CEERNET - Extended Numeric Error Report for Network Reject Cause

The command is related to extended numeric error report.



3GPP TS 24.008  
3GPP TS 24.301

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### 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 (MMGMM/EMM) or session management (SM/ESM) procedure not accepted by the network.

Additional info:

- ▶▶ The following error codes are valid for mobility management (MM/GMM) or session management (SM), i.e. for 2G and 3G networks.

In 4G network the <code>s meanings are included in tables 9.9.4.4.1 (for ESM causes) and 9.9.3.9.1 (for EMM cause) of 3GPP TS 24.301 Release 9.

Name	Type	Default	Description
<code>	integer	A	error code
Values:			
<div>2 : IMSI unknown in HLR</div>			
<div>3 : illegal MS</div>			



- |    |  |
|----|--|
| 4  | : IMSI unknown in VISITOR LR   |
| 5  | : IMEI not accepted  |
| 6  | : illegal ME   |
| 7  | : GPRS not allowed   |
| 8  | : Operator determined barring (SM cause failure)/<br>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  |



- |    |   |  |
|----|---|--|
| 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<br>network failure (SM cause failure)   |
| 39 | : | reactivation required  |
| 40 | : | no PDP context activated (GMM cause failure) /<br>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
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

 Telit recommends that the host controlling the modem defines the proper retry/reboot scheme for reject causes 2, 7, 11, 14, 30, 33, 34, 38.



AT#CEERNET=?

Test command returns OK result code.



## AT#CEERNETEXT - Extended Error Report for Network Reject Cause

This command is both a set and an execution command.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#CEERNETEXT[=[<func>]]**

Set command enables/disables the URC presentation or deletes the last network information. The execution command (AT#CEERNETEXT<CR><LF>) gets the last reject error information from the network and returns the following message:

#CEERNETEXT: <code>,<AcT>,<MCC>,<MNC>

If no error information is present, the execution command returns OK

When URC is enabled, it will occur every time a mobility management (MM/GMM/EMM) or session management (SM/ESM) procedure is not accepted by the network.

The URC message is equal to the message returned by the execution command.

Parameter:

Name	Type	Default	Description
<func>	integer	0	enable/disable the URC or delete the last network info
Values:			
.....			
0	:	disable the #CEERNETEXT URC	
1	:	enable the #CEERNETEXT URC	
2	:	delete last info of <code>, <AcT>, <MCC> and <MNC>	
.....			

Unsolicited fields:

Name	Type	Description
<code>	integer	last numeric Network Reject Cause from network, see <code> in #CEERNET



<AcT> integer access technology of the registered network  
Values:

0 : GSM

8 : CAT-M

9 : NB-IoT

<MCC> string Mobile Country Code of the used network when last numeric code was received

<MNC> string Mobile Network Code of the used network when last numeric code was received



#### AT#CEERNETEXT?

The read command returns the current value of parameter <func> in the format:

#CEERNETEXT: <func>

Additional info:

►► Parameters returned by the read command.

Name	Type	Default	Description
<func>	integer	A	can assume the following values:
Values:			
0	:	#CEERNETEXT URC is disabled	
1	:	#CEERNETEXT URC is enabled	



#### AT#CEERNETEXT=?



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

## AT#CIPHIND - Ciphering Indication

This command enables/disables unsolicited result code for cipher indication.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#CIPHIND=[<mode>]**

Set command enables/disables unsolicited result code for cipher indication. The ciphering indicator feature allows to detect that ciphering is not switched on and to indicate this to the user. The ciphering indicator feature may be disabled by the home network operator setting data in the SIM/USIM. If this feature is not disabled by the SIM/USIM, then whenever a connection is in place, which is unenciphered, or changes from ciphered to unenciphered or vice versa, an unsolicited indication shall be given to the user. The format is:

#CIPHIND: <mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable #CIPHIND: unsolicited result code
Values:			
.....			
0		:	disable
1		:	enable
.....			



**AT#CIPHIND?**

Read command reports the <mode>, <cipher> and <SIM/USIM flag>:

#CIPHIND: <mode>, <cipher>, <SIM/USIM flag>

Additional info:

►► Here is the list of the parameters meaning returned by the read command.



Name	Type	Default	Description
<cipher>	integer	0	shows cipher status
Values: ..... 0 : cipher off  1 : cipher on  2 : unknown (missing network information) .....			
<SIM/USIM flag>	integer	0	SIM/USIM cipher status indication
Values: ..... 0 : disabled  1 : enabled  2 : unknown (flag not read yet) .....			



AT#CIPHIND=?

Test command reports the range for the parameter <mode>



## AT#PSNT - Packet Service Network Type

The command enables/disables unsolicited result code for packet service network type (PSNT)

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#PSNT=[<mode>]

Set command enables/disables unsolicited result code for packet service network type (PSNT) having the following format:

#PSNT:<nt>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables PSNT unsolicited result code.
Values:			
.....			
0	:	disables PSNT unsolicited result code	
1	:	enables PSNT unsolicited result code	
2	:	PSNT unsolicited result code is enabled, and read command returns the message shown in the read section.	
.....			

Unsolicited field:

Name	Type	Description
<nt>	integer	network type
Values:		
.....		
0	:	GPRS network





1	:	EGPRS network
4	:	LTE network
5	:	unknown or not registered



#### AT#PSNT?

If <mode> is set to 0 or 1, read command returns the current values of the <mode> and <nt> parameters in the format:

#PSNT: <mode>,<nt>

If <mode> is set to 2, read command returns the current values of <mode> and <nt> parameters followed by four dummy parameters set to 0.

#PSNT:<mode>,<nt>,0,0,0,0



#### AT#PSNT=?

Test command reports the range for the parameter <mode>



## AT#ENCALG - Set Encryption Algorithm

This command enables or disables the GSM and/or GPRS encryption algorithms supported by the module.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#ENCALG=[<encGSM>][,<encGPRS>]**

Set command enables or disables the GSM and/or GPRS encryption algorithms supported by the module.

Parameters:

Name	Type	Default	Description
<encGSM>	integer	5	<p>The &lt;encGSM&gt; (one byte long) is a bit mask where each bit, when set, indicates the corresponding GSM encryption algorithm</p> <p>bit 0 = A5/1</p> <p>bit 1 = reserved for future use</p> <p>bit 2 = A5/3</p> <p>bits 3 - 7 = reserved for future use</p>
<p>Values:</p> <hr/> <p>0 : no GSM encryption algorithm</p> <p>1÷254 : sum of integers each representing a specific GSM encryption algorithm: 1 – A5/1; 4 – A5/3</p> <p>255 : reset the default values</p> <hr/>			
<encGPRS>	integer	12	<p>The &lt;encGPRS&gt; (one byte long) is a bit mask where each bit, when set, indicates the corresponding GPRS encryption algorithm</p>



bit 0 = GEA1  
bit 1 = GEA2  
bit 2 = GEA3  
bit 3 = GEA4  
bits 4 - 7 = reserved for future use

Values:

0 : no GPRS encryption algorithm

1÷15 : sum of integers each representing a specific GPRS encryption algorithm: 1 – GEA1 2 – GEA2 4 – GEA3 8 – GEA4

255 : reset the default values

- ✦ The values are stored in NVM and available on following reboot.
- ✦ For possible <encGSM> and <encGPRS> encryptions see test command response.
- ✦ If no parameter is issued, the set command returns ERROR.



#### AT#ENCALG?

Read command reports the currently selected <encGSM> and <encGPRS>, and the last used <usedGSM> and <usedGPRS> in the format:

#ENCALG: <encGSM>,<encGPRS>,<usedGSM>,<usedGPRS>

Additional info:

►► Last used <useGSM> and <useGPRS> are expressed in the format:



Name	Type	Default	Description
<usedGSM>	integer	N/A	GSM encryption algorithm
<div>Values:</div> <div><div>0</div><div>:</div><div>no GSM encryption algorithm</div></div> <div><div>1</div><div>:</div><div>A5/1</div></div> <div><div>2</div><div>:</div><div>not available</div></div> <div><div>3</div><div>:</div><div>A5/3</div></div> <div><div>255</div><div>:</div><div>not available</div></div>			
<usedGPRS>	integer	N/A	GPRS encryption algorithms
<div>Values:</div> <div><div>0</div><div>:</div><div>no GPRS encryption algorithm</div></div> <div><div>1</div><div>:</div><div>GEA1</div></div> <div><div>2</div><div>:</div><div>GEA2</div></div> <div><div>4</div><div>:</div><div>GEA3</div></div> <div><div>8</div><div>:</div><div>GEA4</div></div> <div><div>255</div><div>:</div><div>not available</div></div>			



**AT#ENCALG=?**

Test command reports the supported range of values for parameters in the format:  
<encGSM> and <encGPRS>.



```
AT#ENCALG?  
#ENCALG: 5,2,1,1  
OK
```

```
AT#ENCALG=4,1  
OK
```

Sets the GSM encryption algorithm A5/1 and A5/3, and the GPRS encryption algorithm GEA1. A read command will report the last forwarded setting, but the effect will be available at the next reboot.

```
AT#ENCALG?  
#ENCALG: 4,1,1,1
```

The last two values indicate that the last used GSM encryption algorithm is A5/1 and the last used GPRS encryption algorithm is GEA1



## AT+CEMODE - Set Mode of Operation for EPS

This set command configures the mode of operation for EPS.



[1] 3GPP TS 24.301

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT+CEMODE=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	A	<p>mode of operation. The default value depends on product and the support of VoLTE.</p> <p>Default value is 2 for the variants not supporting VoLTE</p> <p>UE modes of operation can be found in standard [1]. Other values are reserved and will result in an ERROR response to the set command.</p>
<p>Values:</p> <p>.....</p> <p>0 : PS mode 2 of operation</p> <p>1 : CS/PS mode 1 of operation</p> <p>2 : CS/PS mode 2 of operation</p> <p>3 : PS mode 1 of operation</p> <p>.....</p>			



AT+CEMODE?

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

+CEMODE: < mode >





The read command will return right values after set command, but effectively the mode of operation changes after power cycle.



AT+CEMODE=?

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



Set EPS mode

AT+CEMODE=1

OK

Check EPS mode

AT+CEMODE?

+CEMODE: 1

OK



## AT+CESQ - Extended Signal Quality

Execution command returns received signal quality parameters according to the network on which the module is registered.



```
[1] 3GPP TS 27.007
[2] 3GPP TS 45.008
[3] 3GPP TS 25.133
[4] 3GPP TS 36.133
```

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT+CESQ

See Additional info section for networks on which the module can be registered.

Additional info:

- ▶▶ The execution command returns the following message. Its format depends on the network on which the module is registered.

2G Networks

+CESQ: <rsqi>,<ber>,255,255,255,255

LTE Networks

+CESQ: 99,99,255,255,<rsrq>,<rsrp>

Name	Type	Default	Description
------	------	---------	-------------





<rss>	integer	N/A	measurements of the radio signal power, expressed in dBm, are mapped to <rss> as shown below
Values: <div>             .....             <div>               0 : -113 dBm or less             </div> <div>               1 : -111 dBm             </div> <div>               2÷30 : -109 dBm .. -53 dBm; 2 dBm per step             </div> <div>               31 : -51 dBm or greater             </div> <div>               32÷63 : Not used             </div> <div>               99 : not known or not detectable or if the current serving cell is not a GERAN cell             </div>             .....           </div>			
<ber>	integer	N/A	channel bit error rate.
Values: <div>             .....             <div>               0÷7 : as RXQUAL values, see 3GPP TS 45.008 subclause 8.2.4             </div> <div>               99 : not known or not detectable or if the current serving cell is not a GERAN cell             </div>             .....           </div>			
<rsrq>	integer	N/A	reference signal received quality, see 3GPP TS 36.133 subclause 9.1.7.
Values:			



			<div> <div>.....</div> <div>0 : <math>\text{rsrq} &lt; -19.5 \text{ dB}</math></div> <div>1 : <math>-19.5 \text{ dB} \leq \text{rsrq} &lt; -19.0 \text{ dB}</math></div> <div>2 : <math>-19.0 \text{ dB} \leq \text{rsrq} &lt; -18.5 \text{ dB}</math></div> <div>... : ...</div> <div>32 : <math>-4 \text{ dB} \leq \text{rsrq} &lt; -3.5 \text{ dB}</math></div> <div>33 : <math>-3.5 \text{ dB} \leq \text{rsrq} &lt; -3 \text{ dB}</math></div> <div>34 : <math>-3 \text{ dB} \leq \text{rsrq}</math></div> <div>255 : not known or not detectable or if the current serving cell is not a E-UTRA cell</div> <div>.....</div> </div>
<rsrp>	integer	N/A	reference signal received power, see 3GPP TS 36.133 subclause 9.1.4.
			<div>Values:</div> <div> <div>.....</div> <div>0 : <math>\text{rsrp} &lt; -140 \text{ dBm}</math></div> <div>1 : <math>-140 \text{ dBm} \leq \text{rsrp} &lt; -139 \text{ dBm}</math></div> <div>2 : <math>-139 \text{ dBm} \leq \text{rsrp} &lt; -138 \text{ dBm}</math></div> <div>... : ...</div> <div>95 : <math>-46 \text{ dBm} \leq \text{rsrp} &lt; -45 \text{ dBm}</math></div> <div>96 : <math>-45 \text{ dBm} \leq \text{rsrp} &lt; -44 \text{ dBm}</math></div> <div>97 : <math>-44 \text{ dBm} \leq \text{rsrp}</math></div> </div>



255 : not known or not detectable or if the current serving cell is not a E-UTRA cell



AT+CESQ=?

Test command returns values supported as compound values.



## AT#ENS - Enhanced Network Selection

Set command is used to activate the Enhanced Network Selection (ENS) functionality.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#ENS=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enable/disable ENS functionality
Values:			
.....			
0		:	disable
1		:	enable
.....			

Additional info:

- ▶▶ If AT#ENS=1 has been issued, at every next power-up SIM Application Toolkit will be enabled on user interface 0 if not previously enabled on a different user interface (AT#STIA=2).  
The new setting will be available at the next power-up.



AT#ENS?

Read command reports whether the ENS functionality is currently enabled or not, in the format:

#ENS: <mode>



AT#ENS=?

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



## 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
Not required	Auto	No



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	A	WDS-Side Stack to be used by the TA. 4G/2G products support <n> parameter values 12, 28 and 30. 30 is factory default 4G only products support <n> parameter value 28
Values:			
.....			
12	:	GSM Digital Cellular Systems, GERAN only	
28	:	E-UTRAN only	
30	:	GERAN and E-UTRAN	
.....			



<n> parameter setting is stored in NVM, and available at next reboot.



For NA (North America) products supporting AT&T requirement 13340 about RAT Balancing and EF-RAT Mode, the value <n> stored with +WS46 command can be changed and overwritten in case of full SIM read, examples: power on; AT+CFUN=4, AT+CFUN=1 sequence; SIM ejection, SIM insertion sequence.



**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>.



## AT+CEDRXS - eDRX Setting

This command controls the setting of the UEs eDRX parameters.



3GPP TS 27.007  
3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT+CEDRXS=[<mode>[,<AcTtype>[,<Req\_eDRX>]]]

Set command controls the setting of the UEs eDRX parameters. The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcTtype>.
<p>Values:</p> <p>0 : disable the use of eDRX</p> <p>1 : enable the use of eDRX</p> <p>2 : enable the use of eDRX and enable the unsolicited result code, see Additional info.</p>			



3 : disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values			
<hr/>			
<AcTtype>	integer	N/A	type of access technology.
Values:			
<hr/>			
0 : Access technology is not using eDRX. This parameter value is only used in the unsolicited result code, it cannot be used in the set command.			
2 : GSM (Gb mode)			
4 : E-UTRAN (CAT M1 mode)			
5 : E-UTRAN (NB1 mode)			
<hr/>			
<Req_eDRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008, Table 10.5.5.32/3GPP TS 24.008. Default value is "0000".

#### Additional info:

- If <mode>=2 and there is a change in the eDRX parameters provided by the network, the unsolicited result code reports:

+CEDRXS:

<AcTtype>[,<Req\_eDRX>[,<NW\_prove\_DRX>[,<PagTimeWindow>]]]





				Name	Type	Default	Description
				<NW_prove_DRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
				<PagTimeWindow>	string	-	half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

```
</> AT+CEDRXS?  
+CEDRXS: 4,"0000"  
+CEDRXS: 5,"0000"  
OK
```



# AT+CEDRXRDP - eDRX Read Dynamic Parameters

This command returns a message related to Extended Discontinuous Reception (eDRX).



3GPP TS 27.007  
3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted
Not required	No	No



## AT+CEDRXRDP

Execution command returns the following message if eDRX is used for the cell that the MS is currently registered to, in the format:

+CEDRXP:<AcTtype>[,<Req\_eDRX>[,<NW\_prov\_eDRX>[,<PagTimeWindow>]]]


If the cell that the MS is currently registered to is not using eDRX, <AcTtype>=0 is returned.

Additional info:

- ▶▶ Here is the list of the meanings of the parameter returned by the +CEDRXRDP command.

Name	Type	Default	Description
<AcTtype>	integer	0	type of access technology.
Values:			
<div>0 : access technology is not using eDRX</div> <div>2 : see +CEDRXS.</div> <div>4 : see +CEDRXS.</div> <div>5 : see +CEDRXS.</div>			



	<Req_eDRX>	string	-	see +CEDRXS.
	<NW_prov_eDRX>	string	-	see +CEDRXS.
	<PagTimeWindow>	string	-	see +CEDRXS.
<hr/>				
<hr/>				
	<b>AT+CEDRXRDP=?</b> Test command returns OK result code.			



## 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
Not required	Specific profile	No



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	<p>enables/disables the network registration unsolicited result code (URC), and selects one of the available formats.</p> <p>The following events triggers the URC:</p> <p>URC short format is displayed every time there is a change in the EPS network registration status</p> <p>URC long format is displayed every time there is a change of network cell in LTE</p>
<p>Values:</p> <p>0 : disable the network registration unsolicited result code</p>			





- 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.



		<p>9 : registered for "CSFB not preferred", home network (not applicable).</p> <p>10 : registered for "CSFB not preferred", roaming (not applicable).</p>									
<ta>	string	tracking area code (two bytes) in hexadecimal format (e.g. "00C3" equals 195 in decimal)									
<ci>	string	LTE cell ID (four bytes) in hexadecimal format									
<AcT>	integer	<p>indicates the access technology of the serving cell.</p> <p>Values:</p> <table> <tr> <td>0</td><td>:</td><td>GSM</td></tr> <tr> <td>8</td><td>:</td><td>CAT M1</td></tr> <tr> <td>9</td><td>:</td><td>NB IoT</td></tr> </table>	0	:	GSM	8	:	CAT M1	9	:	NB IoT
0	:	GSM									
8	:	CAT M1									
9	:	NB IoT									
 <b>AT+CEREG?</b> Read command returns the current value of <mode>, the registration status <stat>, and the information <ta>, <ci>, <AcT> according to the current <mode> parameter value. +CEREG: <mode>,<stat>[,<ta>],[<ci>],[<AcT>]]											
 <b>AT+CEREG=?</b> Test command returns supported values for parameter <mode>.											



## AT#CPSMSCFG - PSM State Configuration

This command configures PSM state

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#CPSMSCFG=<psm\_inactivity\_timeout>[,<psm\_duration\_due\_to\_inactivity>]**

Set command selects PSM inactivity timeout and PSM duration due to inactivity

Parameters:

Name	Type	Default	Description
<psm_inactivity_timeout>	integer	0	PSM inactivity timeout in seconds
Values: ..... 0 : disabled 10÷120 : PSM inactivity timeout in seconds .....			
<psm_duration_due_to_inactivity>	integer	0	PSM duration due to inactivity in seconds
Values: ..... 0 : disabled 120÷7200 : PSM duration due to inactivity in seconds .....			



**AT#CPSMSCFG?**

Read command reports the current value of parameters <psm\_inactivity\_timeout> and <psm\_duration\_due\_to\_inactivity>.







AT#CPSMSCFG=?

Test command returns the range of values for parameters <psm\_inactivity\_timeout> and <psm\_duration\_due\_to\_inactivity>.



## AT#RFSTS - Read Current Network Status

Command reads current network status.

SIM Presence	Setting saved	Can be aborted
Required	No	No

### AT#RFSTS

Execution command returns the current network status. The format of the returned message is according to the network on which the module is registered.

#### GSM network

#RFSTS:<PLMN>,<ARFCN>,<RSSI>,<LAC>,<RAC>,<TXPWR>,<MM>,<RR>,<NOM>,<CID>,<IMSI>,<NetNameAsc>,<SD>,<ABND>

Parameters	Description
<PLMN>	Country code and operator code (MCC, MNC)
<ARFCN>	GSM Assigned Radio Channel
<RSSI>	Received Signal Strength Indication
<LAC>	Localization Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power

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



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



255 UNKNOWN

Parameter/values	Description
<RR>	Radio Resource state (for debug purpose only)
2	CELL SELECTION
3	WAIT CELL SELECTION
4	DEACTIVATION CELL SELECTION
5	SELECT ANY CELL
6	WAIT SELECT ANY CELL
7	DEACTIVATION SELECT ANY CELL
8	WAIT INACTIVE
9	INACTIVE
10	WAIT IDLE
11	IDLE
12	PLMN SEARCH
13	CELL RESELECTION
14	WAIT CELL RESELECTION
15	DEACTIVATION PLMN SEARCH
16	CELL CHANGE
17	CS CELL CHANGE



18	WAIT CELL CHANGE
19	SINGLE BLOCK ASSIGNMENT
20	DOWNLINK TBF ESTABLISH
21	UPLINK TBF ESTABLISH
22	WAIT TBF
23	TRANSFER
24	WAIT SYNC
25	DTM ENHANCED CALL ESTABLISH
25	DTM
27	DTM ENHANCED MO CALL ESTABLISH
28	MO CONNECTION ESTABLISH
29	MT CONNECTION ESTABLISH
30	RR CONNECTION
31	DTM ESTABLISH
32	DTM RELEASE
33	CALL REESTABLISH
34	DEACTIVATION CALL REESTABLISH
35	NORMAL CHANNEL RELEASE
36	LOCAL CHANNEL RELEASE
37	DEACTIVATION



38	ENHANCED DTM CS CALL ESTABLISH
39	CELL RESELECTION TO UTRAN
40	DTM ENHANCED CS CALL ESTABLISH
41	INTER RAT ACTIVE ON HOLD
42	INTER RAT RESEL ABORT
43	INTER RAT WAIT INTER RAT
44	INTER RAT WAIT FOR RSRC
45	DSIM SUSPEND
46	DSIM WAIT SUSPEND
47	DSIM WAIT SUSPEND IDLE

Parameters	Descriptions
<NOM>	Network Operator Mode
<CID>	Cell ID
<IMSI>	International Mobile Subscriber Identity
<NetNameAsc>	Operator name

Parameter/values	Description
<SD>	Service Domain
0	No Service



1	CS only
2	PS only
3	CS+PS

Parameter/values	Description
<ABND>	Active Band
1	GSM 850
2	GSM 900
3	DCS 1800
4	PCS 1900

## LTE network

#RFSTS:<PLMN>,<EARFCN>,<RSRP>,<RSSI>,<RSRQ>,<TAC>,<RAC>,[<TXPWR>],<DRX>,<MM>,<RRC>,<CID>,<IMSI>,[<NetNameAsc>],<SD>,<ABND>,<T3402>,<T3412>,<SINR>

Parameters	Description
<PLMN>	Country code and operator code(MCC, MNC)
<EARFCN>	E-UTRA Assigned Radio Channel
<RSRP>	Reference Signal Received Power; current reference signal received power in dBm x10 as measured by L1. Range: -44 to -140



<RSSI>	Received Signal Strength Indication; current received signal strength indicator as measured by L1. Values are in dBm x10. Range: -120.0 to 0
<RSRQ>	Reference Signal Received Quality; current reference signal received quality as measured by L1. The quantities are in dB x10. Range: -20.0 to -3.0 dB
<TAC>	Tracking Area Code
<RAC>	Routing Area Code
<TXPWR>	Tx Power (In traffic only) in 10 dBm; max value is 230 that is 230/10 = 23 dBm; Range is -112dBm to 23dBm
<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





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

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

Parameters	Description
<T3402>	Timer T3402 in seconds
<T3412>	Timer T3412 in seconds



&lt;SINR&gt;

Signal-to-Interface plus Noise Ratio.

Logarithmic value of SINR.

Values are in 5th of a dB. Range is 0-250 which translates to -20dB - +30dB. For example, if value is 150:

 $150/5 = 30$  (number of dBs not scaled) $30 - 20 = 10$  dB (this is the value scaled to -20 / +30 dB range)

AT#RFSTS=?

Test command tests for command existence.



## AT#SPN - Read SIM Field SPN

This command reads SIM fields SPN.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



### AT#SPN

Execution command returns the service provider string contained in the SIM field SPN, in the format:

#SPN: <spn>

Unsolicited field:

Name	Type	Description
<spn>	string	service provider string contained in the SIM field SPN, represented in the currently selected character set, see +CSCS.



If the SIM field SPN is empty, the command returns the OK result code.



### AT#SPN=?

Test command returns the OK result code.



## AT#CEDRXS - Extended eDRX Setting

This command controls the setting of the UEs eDRX parameters.



3GPP TS 27.007  
3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted
Required	Auto	No

AT#CEDRXS=[<mode>[,<AcTtype>[,<Req\_eDRX>[,<ReqPagTimeWindow>]]]]

Set command controls the setting of the UEs eDRX parameters. The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.
Values: <div> <div>0 : disable the use of eDRX</div> <div>1 : enable the use of eDRX</div> <div>2 : enable the use of eDRX and enable the unsolicited result code, see Additional info.</div> </div>			



			<p>3 : disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values</p> <p>.....</p>
<AcTtype>	integer	N/A	type of access technology.
			<p>Values:</p> <p>.....</p> <p>0 : Access technology is not using eDRX. This parameter value is only used in the unsolicited result code, it cannot be used in the set command.</p> <p>2 : GSM (Gb mode)</p> <p>4 : E-UTRAN (CAT M1 mode)</p> <p>5 : E-UTRAN (NB1 mode)</p> <p>.....</p>
<Req_eDRX>	string	-	<p>half a byte in a 4 bit format. The eDRX value refers to bit-4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008, Table 10.5.5.32/3GPP TS 24.008. Default value is "0000"</p>



<ReqPagTimeWindow>	string	-	half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. Default value is "0000"
--------------------	--------	---	---

Additional info:

►► If <mode>=2 and there is a change in the eDRX parameters provided by the network, the unsolicited result code reports:

#CEDRXP:<AcTtype>[,<Req\_eDRX>[,<NW\_prov\_eDRX>[,<ReqPagTimeWindow>[,<NW\_prov\_PagTimeWindow>]]]]

Name	Type	Default	Description
<NW_prov_eDRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<NW_prov_PagTimeWindow>	string	-	half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information



element in 3GPP TS 24.008 Table  
10.5.5.32/3GPP TS 24.008

AT#CEDRXS?

Read command returns the current settings for each defined value of <AcTtype> in the format:

```
#CEDRXS:<AcTtype>,<eDRX_act_state>,<Req_eDRX>,<ReqPagTimeWindow>,<mode>[<CR><LF>
#CEDRXS:<AcTtype>,<eDRX_act_state>,<Req_eDRX>,<ReqPagTimeWindow>,<mode>[...]]
```

If <AcTtype> is the same the device is registered to, the format is

```
#CEDRXS:<AcTtype>,<eDRX_act_state>,<Req_eDRX>,<ReqPagTimeWindow>,<eDRX_nw_state>,<NW_prov_eDRX>,<NW_prov_PagTimeWindow>,<mode>
```

Additional info:

►► Meaning of the <eDRX\_act\_state> parameter.

Name	Type	Default	Description
<eDRX_act_state>	integer	0	eDRX status
<div> <div>Values:</div> <div> <div>0</div> <div>:</div> <div>eDRX disabled</div> </div> <div> <div>1</div> <div>:</div> <div>eDRX enabled</div> </div> </div>			



►► Meaning of the <eDRX\_nw\_state> parameter.

Name	Type	Default	Description
<eDRX_nw_state>	integer	0	eDRX status in the network
Values:			
<div> <div>0</div> <div>:</div> <div>eDRX disabled</div> </div>			
<div> <div>1</div> <div>:</div> <div>eDRX enabled</div> </div>			

AT#CEDRXS=?

Test command returns the supported <mode>s and the value ranges for the access technology, requested eDRX value and requested Paging Time Window as compound values.



```
AT#CEDRXS?
#CEDRXS: 2,0,"0000","0000"
#CEDRXS: 4,0,"0000","0000"
#CEDRXS: 5,0,"0000","0000"
OK
```





## AT#MONI - Cell Monitor

This command is both a set and an execution command.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#MONI[=[<number>]]**

Set command sets one cell out of seven, in a neighbor list of the serving cell including it, from which extract GSM/LTE related information.

After entering the set command, enter the execution command **AT#MONI<CR>** to get the GSM/LTE related information for the selected cell and dedicated channel (if exists) in the format shown, for each network, in the Additional info section.

Parameter:

Name	Type	Default	Description
<number>	integer	-	the parameter meaning depends on the network, see Additional info section.

Additional info:

▶▶ GSM network

Name	Type	Default	Description
<number>	integer	0	GSM network
Values:			



- 0÷6 : it is the ordinal number of the cell, in the neighbor list of the serving cell.
- 7 : it is a special request to obtain GSM-related information from the whole set of seven cells in the neighbor list of the serving cell

## ▶▶ LTE network

Name	Type	Default	Description
<number>	integer	0	LTE network
Values:			
0	:	it is the serving cell	
1	:	it is the intra-frequency cells	
2	:	it is the inter-frequency cells	
3	:	it is the W-CDMA neighbor cells, the report message is empty.	
4	:	it is the GSM neighbor cells	
5,6	:	it is not available	
7	:	it is a special request to obtain LTE-related information from the all available neighbor cells.	



- Execution command AT#MONI<CR> reports GSM/LTE related information for selected cell and dedicated channel (if exists) in the following formats:

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

GSM network

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

LTE network

```
#MONI: <netname> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id>  
EARFCN:<earfcn> PWR:<dBm> DRX:<drx> pci:<physicalCellId>  
QRxLevMin:<QRxLevMin> TA: <timadv>
```

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

GSM network

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

LTE network

```
#MONI: Cc:<cc> Nc:<nc> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id>  
EARFCN:<earfcn> PWR:<dBm> DRX:<drx> pci:<physicalCellId>  
QRxLevMin:<QRxLevMin> TA: <timadv>
```

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

GSM network

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

LTE network

LTE intra-frequency and inter-frequency cells



#MONI: RSRP:<rsrp> RSRQ:<rsrq> PhysCellId:<physicalCellId>  
EARFCN:<earfcn> PWR:<dBm>

LTE GSM neighbor cells

#MONI: Adj Cell<n> BSIC:<bsic> ARFCN:<arfcn> PWR:<dBm>

Name	Type	Default	Description
<netname>	string	-	name of network operator
<cc>	string	-	country code
<nc>	string	-	network operator code
<n>	integer	-	progressive number of adjacent cell
<bsic>	string	-	base station identification code
<qual>	integer	-	quality of reception: 0..7
<lac>	string	-	localization area code
<id>	integer	-	cell identifier
<arfcn>	integer	-	assigned radio channel
<dBm>	integer	-	received signal strength in dBm.
<timadv>	integer	-	timing advance
<rscp>	integer	-	Received Signal Code Power in dBm.
<drx>	string	-	Discontinuous reception cycle length
<physicalCellId>	integer	-	physical cell identifier



<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<tac>	integer	-	Tracking Area Code
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<QRxLevMin>	integer	-	minimum required RX level in the cell

- ✦ TA: <timadv> reported only for the serving cell.
- ✦ When AT#MONI=7 is the last setting entered, the execution command AT#MONI<CR> reports the information previously listed for each of the cells in the neighbor of the serving cell. The information is formatting in a sequence of <CR><LF>-terminated strings.
- ✦ The timing advance value is meaningful only during calls or GPRS/LTE transfers active.



#### AT#MONI=?

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

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

Additional info:

►► Parameters meaning.



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



The module supports GSM network

```

AT+WS46?
+WS46: 30
OK

AT+CREG?
+CREG: 0,1
OK

AT#MONI=1
OK

AT#MONI=?
#MONI: (6,1)
OK

AT#MONI
#MONI: I TIM BSIC:25 RxQual:0 LAC:D5BD Id:3A27 ARFCN:1018 PWR:-72dbm
TA:-1
OK

AT#MONI=7
OK

AT#MONI=?
#MONI: (6,7)
OK

AT#MONI
#MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN
#MONI: S 25 D5BD 3A27 1018 -74dbm 31 31 4 7 I TIM
#MONI: N1 26 D5BD 3A26 1023 -79dbm -1 -1

```



```
#MONI: N2 21 D5BD 5265 1009 -78dbm -1 -1
#MONI: N3 27 D5BD 5266 13 -87dbm -1 -1
#MONI: N4 25 D5BD 5251 1020 -88dbm -1 -1
#MONI: N5 27 D5BD 5286 1011 -95dbm -1 -1
#MONI: N6 30 00D2 C5A0 16 -99dbm -1 -1
```

```
OK
```



## AT#LTESFN - LTE Frame Information

The command returns system frame number and subframe number of LTE network.

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#LTESFN?

Read command returns system frame number <sysfn> and subframe number <subfn> of LTE network in the following format:

#LTESFN: < sysfn >,< subfn >

Additional info:

►► Here are the parameters meanings.

Name	Type	Default	Description
<sysfn>	integer	-	system frame number
<subfn>	string	-	subframe number.



If module is not registered in LTE network, the command returns ERROR.



### AT#LTESFN=?

Test command returns OK result code.





## AT+CRCES - Reading Coverage Enhancement Status

This execution command returns the coverage enhancement status of the MT. The terminal can consider the coverage enhancement status prior to deciding to transmit. Depending on the coverage enhancement status the terminal can refrain from transmitting data.

The coverage enhancement status is only provided by the MT if the access technology of the serving cell is CAT M1 or NB-IoT. If the access technology of the serving cell is different, <Act>=0 is indicated.



[1] 3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT+CRCES

Additional info:



The execution command returns the following message.

+CRCES: <AcT>,<CE\_level>,<CC>

Name	Type	Default	Description
<AcT>	integer	A	access technology of the serving cell
Values:			
0 : Serving cell has no coverage enhancement			
1 : CAT M1			
3 : NB-IoT			
<CE_level>	integer	A	Coverage Enhancement (CE) level of the MT in the serving cell.
Values:			





# AT#SNRSET - SNR Set Level

Set command manages EFS file SNR\_level\_scan\_scope.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#SNRSET=[<level>]

Parameter:

Name	Type	Default	Description
<level>	integer	2	sets the SNR level to be used in scanning networks
Value:			
.....			
1÷3 : levels			
.....			



AT#SNRSET?

Read command reports the current value for <level>, in the format:

#SNRSET: <level>



AT#SNRSET=?

Test command reports the range for the parameter <level>.



## AT#IOTBND - CAT-M1 & NB-IoT Band Setting

Set command configures the CAT-M1 and NB-IoT bands.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#IOTBND=[<lte\_m1\_band\_pref.bits\_1\_64>][,<lte\_m1\_band\_pref.bits\_65\_128>][,<lte\_nb1\_band\_pref.bits\_1\_64>,<lte\_nb1\_band\_pref.bits\_65\_128>]]

Parameters:

Name	Type	Default	Description
<lte_m1_band_pref.bits_1_64>	integer	-	indicates the lower (1-64) CAT-M1 supported bands, expressed as the sum of Band number (0 meaning "no low band selected"); see #BND command
<lte_m1_band_pref.bits_65_128>	integer	-	indicates the higher (65-128) CAT-M1 supported bands, expressed as the sum of Band number (0 meaning "no high band selected"); see #BND command
<lte_nb1_band_pref.bits_1_64>	integer	-	indicates the lower (1-64) NB-IoT supported bands, expressed as the sum of Band number (0 meaning "no low band selected"); see #BND command



<code>&lt;lte_nb1_band_pref.bits_65_128&gt;</code>	integer	-	indicates the higher (65-128) NB-IoT supported bands, expressed as the sum of Band number (0 meaning "no high band selected"); see #BND command
--	---------	---	---

 The command needs a reboot to be effective.



#### AT#IOTBND?

Read command returns the current parameters setting for #IOTBND command in the following format:

#IOTBND: <lte\_m1\_band\_pref.bits\_1\_64>,<lte\_m1\_band\_pref.bits\_65\_128>,<lte\_nb1\_band\_pref.bits\_1\_64>,<lte\_nb1\_band\_pref.bits\_65\_128>



#### AT#IOTBND=?

Test command reports the supported range of values for parameters:

<lte\_m1\_band\_pref.bits\_1\_64>,<lte\_m1\_band\_pref.bits\_65\_128>,<lte\_nb1\_band\_pref.bits\_1\_64>,<lte\_nb1\_band\_pref.bits\_65\_128>



## AT#IRATTIMER - Inter RAT Timer Setting

Set command configures the IRAT timer and search alignment timer in dedicated EFS file

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#IRATTIMER=<irat\_timer>,<search\_alignment>

Parameters:

Name	Type	Default	Description
<irat_timer>	integer	-	<p>IRAT timer to move to higher priority RAT for CIoT device in minutes. If the device camps on the non-preferred system, it performs periodic searches for the priority system in the foreground.</p> <p>Foreground PLMN search:</p> <p>NAS runs a dedicated timer to search for a more preferable RAT. Once the timer expires, NAS reads the dedicated EFS to establish if the UE is camped on a less preferred system. If so, a service request is sent to search the relevant RAT.</p> <p>Default value is usually 60, but it could vary based on single operator request. You should check using read command.</p>
<search_alignment>	integer	20	timer in minutes to specify if the modem can proceed with the BPLMN search or not.
<p>Value:</p> <p>.....</p> <p>20 : timer of 20 minutes</p> <p>.....</p>			





The command needs a reboot to be effective.



### AT#IRATTIMER?

Read command returns the current parameters setting for #IRATTIMER command in the format:

#IRATTIMER: <irat\_timer>,<search\_alignment>



### AT#IRATTIMER=?

Test command returns the supported range of values for <irat\_timer> and <search\_alignment>.



## AT#HIGHTP - Enable High Throughput

This command enables ce-HARQ-AckBundling-r14 and ce-SchedulingEnhancement-r14 in order to reach the max throughput in Downlink on CAT-M RAT.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#HIGHTP=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	A	enable High throughput mode
Values:			
.....			
0	:	Normal throughput mode; ce-HARQ-AckBundling-r14 and ce-SchedulingEnhancement-r14 are NOT enabled	
1	:	High throughput mode; ce-HARQ-AckBundling-r14 and ce-SchedulingEnhancement-r14 are enabled	
.....			



AT#HIGHTP?

Read command returns the operating status of the device in the format:

#HIGHTP: <status>

where:

<status>

0 - Normal throughput mode; ce-HARQ-AckBundling-r14 and ce-SchedulingEnhancement-r14 disabled.

1 - High throughput mode; ce-HARQ-AckBundling-r14 and ce-SchedulingEnhancement-r14 enabled.



AT#HIGHTP=?

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





## AT#RPMCFG - RPM function enable

This command enables/disables RPM (Radio Policy Management) function.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#RPMCFG=<rpm\_ena>

Set command enables/disable the RPM function.

Parameter:

Name	Type	Default	Description
<rpm_ena>	integer	N/A	Indicates whether RPM functionality is to be enabled or disabled at power up.
Values:			
.....			
0 : Disabled			
1 : Enabled			
2 : Enabled even if the PLMN is not in the PLMN LIST			
.....			



AT#RPMCFG command is fully supported on non Verizon products.

On Verizon products only the read command is supported. AT#DRCFG command should be used instead.



Use the command AT#RPMPLMNLIST to set or read the PLMN LIST according to the RPM needs.



A reboot is required in order for a change to be effective





## AT#RPMCFG?

Read command reports RPM function status.

Additional info:

- For Verizon products, the read command also reports the values related to DR function (see #DRCFG command) parameters.

The parameters are the current values for last EMM reject cause, counter for received EMM reject cause 3/6/7/8/15 from NAS, and timer for tracking RPM EMM reject event (in minutes) in the format :

#RPMCFG:

<rpm\_ena>,<EMM\_rej\_counter\_max>,<last\_EMM\_rej\_cause>,<EMM\_rej\_counter>,<EMM\_max\_event\_timer>,<EMM\_time\_left\_to\_expiration>

where:

<EMM\_rej\_counter\_max>: maximum allowable number for LTE RPM EMM reject event

<last\_EMM\_rej\_cause>: last EMM reject cause

<EMM\_rej\_counter>: counter for received EMM reject cause 3/6/7/8 from NAS

<EMM\_max\_event\_timer>: maximum allowable event tracking time for LTE RPM

<EMM\_time\_left\_to\_expiration>: expiry time in minutes



## AT#RPMCFG=?

Test command returns the list of supported values of parameter <rpm\_ena>.



## AT#RPMCFGEXT - RPM function configuration

This command configures RPM (Radio Policy Management) function.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#RPMCFGEXT=

<app\_max\_num\_reset>,<app\_reset\_counter>,<app\_reset\_timer>,  
<app\_reset\_blk\_leak\_rate\_timer>,<avg\_reset\_time>,<leak\_rate\_time>,  
<backoff\_cnt\_0>,<backoff\_cnt\_1>,<backoff\_cnt\_2>,<backoff\_cnt\_3>,  
<cpdp\_cnt\_0>,<cpdp\_cnt\_1>,<cpdp\_cnt\_2>,<cpdp\_cnt\_3>,<lr3\_timer>

Set command sets the RPM configuration parameters.

Parameters:

Name	Type	Default	Description
<app_max_num_reset>	integer	N/A	N1. Max number of SW resets per Hour allowed by RPM following "permanent" MM/GMM/EMM reject
Value: ..... 0÷255 : Max number of SW resets .....			
<app_reset_counter>	integer	N/A	APP-initiated reset per hour
Value:			



		<div>0÷255</div> <div>:</div> <div>reset counter</div>	
<app_reset_timer>	integer	N/A	1 hour Timer for tracking APP initiated reset
	Value:		
		<div>0÷65535</div> <div>:</div> <div>reset timer</div>	
<app_reset_blk_leak_rate_timer>	integer	N/A	LR-1. Leak rate for C-BR-1 (Counter related to N1)
	Value:		
		<div>0÷65535</div> <div>:</div> <div>leak rate timer</div>	
<avg_reset_time>	integer	N/A	T1. Average time before RPM resets modem following "permanent" MM/GMM/ EMM reject
	Values:		
		<div>0</div> <div>:</div> <div>disabled</div>	
		<div>1÷254</div> <div>:</div> <div>defines in 6 min increments the time to reset after</div>	



			receiving a permanent MM/ GMM/EMM reject
	255	:	timer value to be considered is T1_ext
<leak_rate_time>	integer	N/A	LR-2. Leak rate for C-R-1 (Counter related to T1)
	Value:		
	0÷65535	:	leak rate time
<backoff_cnt_0>	integer	N/A	F1. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a PDP Activation ignore Scenario.
	Value:		
	0÷255	:	backoff_cnt_0
<backoff_cnt_1>	integer	N/A	F2. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM



following a "permanent" PDP Activation Reject.			
Value:			
<div> <div>0÷255</div> <div>:</div> <div>backoff_cnt_1</div> </div>			
<backoff_cnt_2>	integer	N/A	F3. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a "temporary" PDP Activation Reject.
Value:			
<div> <div>0÷255</div> <div>:</div> <div>backoff_cnt_2</div> </div>			
<backoff_cnt_3>	integer	N/A	F4. Max number of PDP context or PDN Connectivity Activation/ Deactivation Requests per Hour allowed by RPM
Value:			
<div> <div>0÷255</div> <div>:</div> <div>backoff_cnt_3</div> </div>			



<cpdp_cnt_0>	integer	N/A	CPDP-1
Value: ..... 0÷255 : cpdp_cnt_0 .....			
<cpdp_cnt_1>	integer	N/A	CPDP-2
Value: ..... 0÷255 : cpdp_cnt_1 .....			
<cpdp_cnt_2>	integer	N/A	CPDP-3
Value: ..... 0÷255 : cpdp_cnt_2 .....			
<cpdp_cnt_3>	integer	N/A	CPDP-4
Value: ..... 0÷255 : cpdp_cnt_3 .....			
<lr3_timer>	integer	N/A	LR-3. Leak Rate3 timer (hour).  Leak rate for CPDP-1 to C-PDP-4 (Counter related to F1)



Value:

.....  
0÷255 : lr3\_timer  
.....



### AT#RPMCFGEXT?

Read command reports the RPM configuration parameters.

#RPMCFGEXT:

<app\_max\_num\_reset>,<app\_reset\_counter>,<app\_reset\_timer>,  
<app\_reset\_blk\_leak\_rate\_timer>,<avg\_reset\_time>,<leak\_rate\_time>,  
<backoff\_cnt\_0>,<backoff\_cnt\_1>,<backoff\_cnt\_2>,<backoff\_cnt\_3>,  
<cpdp\_cnt\_0>,<cpdp\_cnt\_1>,<cpdp\_cnt\_2>,<cpdp\_cnt\_3>,<lr3\_timer>



### AT#RPMCFGEXT=?

Test command returns OK result.





## AT#RPMT1EXT - RPM timer T1\_ext

This command reads and sets the RPM related timer T1\_ext.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#RPMT1EXT=<t1\_ext>

Set command enables/disable the RPM function.

Parameter:

Name	Type	Default	Description
<t1_ext>	integer	48	T1_ext value
Values:			
.....			
0	:	disabled	
1÷254	:	defines in 1 hour increments the time to reset after receiving a permanent MM/GMM/EMM reject	
.....			



AT#RPMT1EXT?

Read command reports current T1\_ext value:

#RPMT1EXT: <t1\_ext>



AT#RPMT1EXT=?

Test command returns the supported range of values for <t1\_ext>.



## AT#RPMINFO - RPM function information

This command reads RPM (Radio Policy Management) parameters from SIM or EFS.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#RPMINFO?

Read command reports the RPM configuration parameters. If a parameter value is unknown (cannot be retrieved, e.g. RPM version) it will not be displayed.

#RPMINFO:

<RpmFlag>,<RpmN1>,<RpmT1>,<RpmT1\_ext>,<RpmF1>,<RpmF2>,<RpmF3>,<RpmF4>,<RpmLR-1>,<RpmLR-2>,<RpmLR-3>,[<RpmC-BR-1>],[<RpmC-R-1>],<RpmC-PDP-1>,<RpmC-PDP-2>,<RpmC-PDP-3>,<RpmC-PDP-4>,[<RpmVer>],<RpmOrigin>

Additional info:

►► Parameters:

Name	Type	Default	Description
<RpmFlag>	integer	N/A	RPM enabled flag
Values:			
0 : RPM disabled			
1 : RPM enabled			
<RpmN1>	integer	N/A	N1. Max number of SW resets per Hour allowed by RPM following



"permanent" MM/GMM/EMM reject			
Values: ..... 0÷255 : Max number of SW resets .....			
<RpmT1>	integer	N/A	T1 average time before RPM resets modem following "permanent" MM/GMM/EMM reject
Values: ..... 0 : disabled  1÷254 : defines in 6 min increments the time to reset after receiving a "permanent" MM/GMM/EMM reject  255 : timer value to be considered is T1_ext .....			
<RpmT1_ext>	integer	N/A	T1 average time before RPM resets modem following "permanent" MM/GMM/EMM reject if T1 = 0xFF
Values: ..... 0 : disabled  1÷254 : defines in 1 hour increments the time to reset after receiving a "permanent" MM/GMM/EMM reject .....			



<RpmF1>	integer	N/A	F1. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a PDP Activation ignore Scenario
Values: ..... 0÷255 : Maximum attempts allowed .....			
<RpmF2>	integer	N/A	F2. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a "permanent" PDP Activation Reject
Values: ..... 0÷255 : Maximum attempts allowed .....			
<RpmF3>	integer	N/A	F3. Max number of PDP Activation Requests / PDN Connectivity Requests per Hour allowed by RPM following a "temporary" PDP Activation Reject
Values: ..... 0÷255 : Maximum attempts allowed .....			
<RpmF4>	integer	N/A	F4. Max number of PDP context or PDN Connectivity Activation/




Deactivation Requests per Hour allowed by RPM			
Values: ..... 0÷255 : Maximum attempts allowed .....			
<RpmLR-1>	integer	N/A	LR-1 Leak rate for C-BR-1 (Counter related to N1)
Values: ..... 0 : C-BR-1 shall not be decremented 1÷255 : number of hours before C-BR-1 is decremented by 1 .....			
<RpmLR-2>	integer	N/A	LR-2 Leak rate for C-R-1 (Counter related to T1)
Values: ..... 0 : C-R-1 shall not be decremented 1÷255 : number of hours before C-R-1 is decremented by 1 .....			
<RpmLR-3>	integer	N/A	LR-3. Leak rate for C-PDP-1 to C-PDP-4 (Counter related to F1)
Values:			



		<p>0 : C-PDP-1 TO C-PDP-4 shall not be decremented</p> <p>1÷255 : number of hours before C-PDP-1 TO C-PDP-4 is decremented by 1</p>	
<RpmC-BR-1>	integer	N/A	C-BR-1 counter related to N1
		<p>Values:</p> <p>1÷255 : number of control actions triggered by N1</p>	
<RpmC-R-1>	integer	N/A	C-R-1 counter related to T1
		<p>Values:</p> <p>1÷255 : number of control actions triggered by T1</p>	
<RpmC-PDP-1>	integer	N/A	C-PDP-1 counter related to F1
		<p>Values:</p> <p>0÷255 : number of control actions triggered by F1</p>	
<RpmC-PDP-2>	integer	N/A	C-PDP-2 counter related to F2



	Values: ..... 0÷255 : number of control actions triggered by F2 .....		
	<RpmC-PDP-3>	integer	N/A C-PDP-3 counter related to F3
	Values: ..... 0÷255 : number of control actions triggered by F3 .....		
	<RpmC-PDP-4>	integer	N/A C-PDP-4 counter related to F4
	Values: ..... 0÷255 : number of control actions triggered by F4 .....		
	<RpmVer>	integer	N/A RPM version implemented on the device
	<RpmOrigin>	integer	N/A Origination of RPM parameters
Values: ..... 0 : UE's memory ..... 1 : USIM .....			
.....			
 AT#RPMINFO=?			



Test command returns OK result.





## AT#RPMPLMNLIST - Update RPM PLMN List

This set command adds a new entry, or updates an already present one, in the module RPM (Radio Policy Management) PLMN list stored in file system.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#RPMPLMNLIST=<index>,<action>[,<MCC>,<MNC>]

Parameters:

Name	Type	Default	Description
<index>	integer	-	index of the entry to act upon
<action>	integer	A	remove/update RPM PLMN list items
<p>Values:</p> <p>.....</p> <p>0 : remove the entry with selected &lt;index&gt;; optional parameters &lt;MCC&gt; and &lt;MNC&gt;, if given, are ignored</p> <p>1 : update the entry with selected &lt;index&gt; if it is already present, otherwise add it</p> <p>.....</p>			
<MCC>	integer	-	Mobile Country Code
<MNC>	integer	-	Mobile Network Code



AT#RPMPLMNLIST?

Read command returns the list of entries added or updated with set command, in the format:

#RPMPLMNLIST: <index>,<MCC>,<MNC><CR><LF>

#RPMPLMNLIST: <index>,<MCC>,<MNC><CR><LF>

...



AT#RPMPLMNLIST=?

Test command returns the range of <index>, <action>, <MCC> and <MNC> parameters.



## AT#BOTMR - BackOff Timers

This command displays the time left for expiration of BackOff timers, and enables/disables URC indicating that a BackOff timer has started

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#BOTMR=<onoff>

Set command enables/disables the URC that indicates that a BackOff timer has started.

Parameter:

Name	Type	Default	Description
<onoff>	integer	0	Enables/disables the URC that informs the user about start of a BackOff timer, using the following unsolicited indication
Values:			
0	:	Disable URC	
1	:	Enable URC	

Unsolicited fields:

Name	Type	Description
<timername>	string	Timer name
<timerexp>	integer	Time in minutes left before expiration for the timer that prevents registration/attach attempts





## AT#BOTMR?

Read command reports whether a BackOff timer is currently running or not, in the format:

#BOTMR: <onoff>,<status>[,<timerexp>,<timername>]

Additional info:

▶▶ Parameter meaning:

Name	Type	Default	Description
<status>	integer	N/A	Timer status
Values: <div> <div>0</div> <div>:</div> <div>Timer mechanism inactive, not preventing registration/attach; &lt;timerexp&gt; and &lt;timername&gt; not shown</div> </div> <div> <div>1</div> <div>:</div> <div>Timer mechanism active: the module will not attempt registration/attach until &lt;timerexp&gt; minutes are elapsed</div> </div>			



## AT#BOTMR=?

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



## AT#DRCFG - Data Retry function enable

This command enables/disables the Data Retry (DR) function

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No

AT#DRCFG=<dr\_ena>

Set command enables/disables the Data Retry (DR) function and it resets related parameters in NV.

Parameters:

Name	Type	Default	Description
<dr_ena>	integer	N/A	Indicates whether Data Retry (DR) functionality is to be enabled or disabled at power up.
Values: <div> <div>0 : Disable DR and reset last EMM reject cause, counter for received EMM reject cause 15 from NAS, and timer for tracking DR EMM reject event stored in NV</div> <div>1 : Enable DR and reset last EMM reject cause, counter for received EMM reject cause 15 from NAS, and timer for tracking DR EMM reject event stored in NV</div> </div>			

AT#DRCFG?

Read command reports DR function status, current values for last EMM reject cause, counter for received EMM reject cause 15 from NAS, and timer for tracking RPM EMM reject event (in minutes) in the format:

#DRCFG:

<dr\_ena>,<EMM\_rej\_counter\_max>,<last\_EMM\_rej\_cause>,<EMM\_rej\_counter>,<EMM\_max\_event\_timer>,<EMM\_time\_left\_to\_expiration>

Additional info:



Parameters meaning:

Name	Type	Default	Description
<EMM_rej_counter_max>	integer	-	maximum allowable number for LTE RPM EMM reject event
<last_EMM_rej_cause>	integer	-	last EMM reject cause
<EMM_rej_counter>	integer	-	counter for received EMM reject cause 15 from NAS
<EMM_max_event_timer>	integer	-	maximum allowable event tracking time for LTE RPM
<EMM_time_left_to_expiration>	integer	-	time in minutes left for RPM lock timer to expiry

AT#DRCFG=?

Test command returns the list of supported values of parameter <dr\_ena>



## AT#NB2ENA - Enable/Disable NB2 mode

This execution command enables/disables NB2 mode. It is only applicable to products supporting NB-IoT technology.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#NB2ENA=<ena>

Parameter:

Name	Type	Default	Description
<ena>	integer	0	Enable/Disable NB2 mode
Values:			
.....			
0	:	Disable	
1	:	Enable	
.....			



AT#NB2ENA?

Read command reports the current NB2 enabling status in the format:

#NB2ENA: <ena>



AT#NB2ENA=?

Test command returns the current range of values for parameter <ena>.



## AT+CLIP - Calling Line Identification Presentation

This 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.



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SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No


**AT+CLIP=[<enable>]**

Set command enables/disables the presentation of the CLI (Calling Line Identity).  
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	enable flag
Values:			
<div> <div>0</div> <div>:</div> <div>disables CLI indication</div> </div>			
<div> <div>1</div> <div>:</div> <div>enables CLI indication</div> </div>			

Unsolicited fields:

Name	Type	Description
------	------	-------------



<number>	string	phone number of format specified by <type>									
<type>	integer	type of address octet Values: <table> <tr> <td>128</td><td>:</td><td>both the type of number and the numbering plan are unknown</td></tr> <tr> <td>129</td><td>:</td><td>unknown type of number and ISDN/Telephony numbering plan</td></tr> <tr> <td>145</td><td>:</td><td>international type of number and ISDN/Telephony numbering plan (contains the character "+")</td></tr> </table>	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 "+")
128	:	both the type of number and the numbering plan are unknown									
129	:	unknown type of number and ISDN/Telephony numbering plan									
145	:	international type of number and ISDN/Telephony numbering plan (contains the character "+")									
<alpha>	string	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: <table> <tr> <td>0</td><td>:</td><td>CLI valid</td></tr> <tr> <td>1</td><td>:</td><td>CLI has been withheld by the originator</td></tr> <tr> <td>2</td><td>:</td><td>CLI is not available due to interworking problems or limitation or originating network</td></tr> </table>	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
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)







The command changes only the report behavior of the device, it does not change CLI supplementary service setting on the network.



## AT+CLIP?

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

+CLIP: <enable>,<m>

Additional info:



Parameters:

Name	Type	Default	Description
<enable>	integer	N/A	status of the local setting
Values:			
0 : CLI presentation disabled			
1 : CLI presentation enabled			
<m>	integer	N/A	status of the CLIP service on the GSM network.
Values:			
0 : CLIP not provisioned			
1 : CLIP provisioned			
2 : unknown (e.g. no network is present)			





This command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.



AT+CLIP=?

Test command returns the supported values of parameter <enable>



#### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## AT#WS46 - Select IoT Technology

This command selects the IoT technology.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#WS46=[<n>[,<GSM\_P>]]

Set command selects the IoT technology to operate with.

Parameters:

Name	Type	Default	Description										
<n>	integer	-	<p>selects the technology to be used.</p> <p>The default value depends on the LTE technology supported by the module</p> <table><tr><th>LTE technology supported</th><th>&lt;n&gt; value</th></tr><tr><td>CAT-M1</td><td>0</td></tr><tr><td>NB-IoT</td><td>1</td></tr><tr><td>CAT-M1 (preferred) and NB-IoT</td><td>2</td></tr><tr><td>CAT-M1 and NB-IoT (preferred)</td><td>3</td></tr></table>	LTE technology supported	<n> value	CAT-M1	0	NB-IoT	1	CAT-M1 (preferred) and NB-IoT	2	CAT-M1 and NB-IoT (preferred)	3
LTE technology supported	<n> value												
CAT-M1	0												
NB-IoT	1												
CAT-M1 (preferred) and NB-IoT	2												
CAT-M1 and NB-IoT (preferred)	3												
<GSM_P>	integer	0	<p>selects the technology priority. In case of both 2G (GSM) and 4G (LTE) networks present selects priority between 2G and 4G.</p>										



Values:

0 : 4G (LTE) priority

1 : 2G (GSM) priority

 The command takes effect after the module reboot.

 The ME310G1-W2 only supports 0 and 1 values for <n>, not 2 and 3.



AT#WS46?

Read command reports the currently selected technology and priority, in the format:

#WS46: <n>,<GSM\_P>



AT#WS46=?

Test command reports the range for the parameters <n> and <GSM\_P>.



## AT#BNDOPTIONS - Read Bands that can be selected

This command allows to read the bands that are selectable and that can be enabled.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#BNDOPTIONS

Execution command returns the bands that are selectable and that can be enabled, in the format:

AT#BNDOPTIONS

AT#BNDOPTIONS: B1, B2, .. , B86

OK



### AT#BNDOPTIONS=?

Test command returns OK result code.



Note: this AT command may not be supported depending on the module and/or the SW version. In this case an error will be returned.



# SIM



## AT+CPIN - Enter the PIN

The command sends to the device a password which is necessary before it can be operated.



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SIM Presence	Setting saved	Can be aborted
Not required	Other	No



**AT+CPIN=<pin>[,<newpin>]**

Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.).

If the PIN required is SIM PUK or SIM PUK2, the <newpin> is required. This <newpin>, will replace the old pin in the SIM.

The command may be used to change the SIM PIN by sending it with both parameters <pin> and <newpin>.

Parameters:

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
------	------	---------	-------------



<code>&lt;code&gt;</code>	string	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>&lt;code&gt;</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>&lt;code&gt;</code> is returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18) |
| PH-NET PIN    | : | ME is waiting network personalization password to be given   |
| PH-NET PUK    | : | ME is waiting network personalization unblocking password to be given  |
| PH-NETSUB PIN | : | ME is waiting network subset personalization password to be given  |





PH-NETSUB PUK	:	ME is waiting network subset personalization unblocking password to be given
PH-SP PIN	:	ME is waiting service provider personalization password to be given
PH-SP PUK	:	ME is waiting service provider personalization unblocking password to be given
PH-CORP PIN	:	ME is waiting corporate personalization password to be given
PH-CORP PUK	:	ME is waiting corporate personalization unblocking password to be given



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  
OK  
you inserted the SIM and module is not waiting for PIN



## AT#PCT - Display PIN Counter

This command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, if +CPIN password is required.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#PCT

Execution command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, depending on +CPIN requested password, in the format:

#PCT: <n>

Additional info:

►► Here is shown the parameter meaning.

Name	Type	Default	Description
<n>	integer	A	remaining attempts.
Values:			
0	:	the SIM is blocked	
1÷3	:	if the device is waiting either SIM PIN or SIM PIN2 to be given.	
1÷10	:	if the device is waiting either SIM PUK or SIM PUK2 to be given.	



### AT#PCT=?

Test command returns the OK result code.



```
AT+CPIN?
+CPIN: SIM PIN
OK
```







<pre>AT#PCT #PCT: 3 OK  AT+CPIN=1111      Input incorrect PIN number +CME ERROR: incorrect password  AT#PCT #PCT: 2 OK</pre>	
--	--



# AT+CCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

SIM Presence	Setting saved	Can be aborted
Required	Other	No

	<p>AT+CCID</p> <p>The command returns the following message:</p> <p>+CCID: &lt;ICCID&gt;</p> <p>OK</p>
	<p>AT+CCID?</p> <p>Read command returns the following message:</p> <p>+CCID: &lt;ICCID&gt;</p> <p>OK</p>
	<p>AT+CCID=?</p> <p>Test command returns the OK result code.</p>
	<p>AT+CCID</p> <p>+CCID: 89861109091740011006</p> <p>OK</p>



## AT+CIMI - International Mobile Subscriber Identity (IMSI)

This command returns the International Mobile Subscriber Identity (IMSI number).



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CIMI

Execution command returns the value of the International Mobile Subscriber Identity stored in the SIM, the returned message has the following format (with command no echoed):

<IMSI value>  
OK



If the SIM is not inserted, the command returns ERROR.



AT+CIMI=?

Test command returns OK result code



AT+CIMI  
22201701202507  
OK



## AT#CIMI - International Mobile Subscriber Identity (IMSI)

This command returns the International Mobile Subscriber Identity (IMSI number).

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#CIMI

Execution command returns the value of the International Mobile Subscriber Identity stored in the SIM, the returned message has the following format (with command echoed):

```
#CIMI: <IMSI value>
OK
```



If the SIM is not inserted, the command returns ERROR.



### AT#CIMI=?

Test command returns the OK result code.



```
AT#CIMI
#CIMI: 450050209516643
OK
```



## AT#SIMDET - SIM Detection Mode

The command manages the SIM Detection mode.



[1] Telit Hardware Design Guide of the used module.

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No



AT#SIMDET=<mode>

Set command simulates the SIM status or selects the automatic SIM Detection status. This command is used: by modules providing the SIMIN pin, dedicated or set through #SIMINCFG command; by modules without SIMIN pin, forcing SIM presence or absence. Refer to document [1] to have information on dedicated SIMIN pin.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	the <mode> parameter can be used as shown in Values section.
<p>Values:</p> <p>.....</p> <p>0 : ignores dedicated SIMIN pin, and simulate the status "SIM Not Inserted"</p> <p>1 : ignores dedicated SIMIN pin, and simulate the status "SIM Inserted"</p> <p>2 : selects automatic SIM detection using dedicated SIMIN Pin</p> <p>.....</p>			



- ✦ When #SIMDET=1 (that simulates "SIM Inserted") is issued, a query to detect the presence of the SIM is forced, regardless of SIMIN pin status. If SIM is correctly answering to queries then SIM status becomes SIM READY.
- ✦ For ME910G1 family, default value of <mode> parameter is 2.
- ✦ If the SIMIN pin is not connected to the SIM holder, do not use #SIMDET=2



### AT#SIMDET?

Read command returns the currently selected Sim Detection Mode in the format:

#SIMDET: <mode>,<simIn>

Additional info:

- ▶▶ The values for <simIn> are:

Name	Type	Default	Description
<simIn>	integer	0	SIMIN pin status.
Values:			
<div>0 : SIM not inserted</div> <div>1 : SIM inserted</div>			

- ✦ The <simIn> parameter is meaningless in absence of the SIMIN pin.







AT#SIMDET=?

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



## AT#SIMPR - SIM Presence Status

The command enables/disables the SIM Presence Status unsolicited indication.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



**AT#SIMPR=[<mode>]**

Set command enables/disables the SIM Presence Status unsolicited indication in the ME. This command reports also the status of the remote SIM, if the SIM Access Profile (SAP) functionality is supported and has been enabled.

If notification is enabled, the ME informs about every (local and remote) SIM status change through the following URC:

#SIMPR: <SIM>,<status>






Parameter:

Name	Type	Default	Description
<mode>	integer	0	Specifies if notification must be enabled or disabled.
Values:			
.....			
0	:	notification disabled	
1	:	notification enabled	
.....			

Unsolicited fields:

Name	Type	Description
<SIM>	integer	Reports local or remote SIM
Values:		
.....		
0	:	local SIM



	1	:	remote SIM
<status>	integer	Reports current SIM status	
	Values:		
	0	:	SIM not inserted
	1	:	SIM inserted
 <status> parameter is meaningless for local SIM in absence of the SIMIN pin, see #SIMDET command.			
 Entering AT#SIMPR= returns OK but has no effect.			
	AT#SIMPR?		
	Read command reports whether the unsolicited indication #SIMPR: is currently enabled or not, along with the local and remote SIM status, in the format:		
	#SIMPR: <mode>,<SIM>,<status><CR><LF>		
	#SIMPR: <mode>,<SIM>,<status>		
	 If SAP functionality is not supported or enabled the remote SIM status will always be 0		
	AT#SIMPR=?		
	Test command reports the range for the parameter <mode>		



## AT#CCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#CCID

The command returns the following message:

```
#CCID: <ICCID>
OK
```



AT#CCID=?

Test command returns the OK result code.



AT#CCID

```
#CCID: 89861109091740011006
OK
```



## AT#QSS - Query SIM Status

Query SIM Status.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT#QSS=[<mode>]

Enables/disables the Query SIM Status unsolicited indication in the ME. The format of the unsolicited indication is the following:

#QSS: <status>

The parameter is described in the Unsolicited field section.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Type of notification
<p>Values:</p> <hr/> <p>0 : disabled. It is only possible to query the current SIM status through read command AT#QSS?</p> <p>1 : enabled. The ME informs at every SIM status change through the basic unsolicited indication where &lt;status&gt; range is 0...1</p> <p>2 : enabled. The ME informs at every SIM status change through the basic unsolicited indication where &lt;status&gt; range is 0...3</p> <hr/>			

Unsolicited field:



Name	Type	Description
<status>	integer	current SIM status Values:  0 : SIM not inserted  1 : SIM inserted  2 : SIM inserted, and PIN unlocked  3 : SIM inserted and READY (SMS and Phonebook access are possible)



### AT#QSS?

Read command reports whether the unsolicited indication #QSS is currently enabled or not, along with the SIM status, in the format:

#QSS: <mode>,<status>

The parameters are described in the previous sections.



<status> parameter value depends also on #SIMDET <mode> setting.

If #SIMDET <mode> is set to 1, #QSS will show a <status> of 1, even if SIM is not inserted



### AT#QSS=?

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



## AT+CRSM - Restricted SIM access

The command transmits to the UICC some specific commands and their required parameters.



3GPP TS 11.11  
3GPP TS 31.101  
3GPP TS 31.102

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CRSM=<command>[,<fileId>[,<P1>[,<P2>[,<P3>[,<data>]]]]]

Set command transmits to the UICC the specific command and its required parameters. The command response shows the status words and response data returned by the UICC in the format:

+CRSM: <sw1>,<sw2>[,<response>]

For parameters meanings see Additional info section.

Parameters:

Name	Type	Default	Description
<command>	integer	176	command passed on to the UICC
Values:			
176	:	READ BINARY	
178	:	READ RECORD	
192	:	GET RESPONSE	
214	:	UPDATE BINARY	
220	:	UPDATE RECORD	
242	:	STATUS	



<fileId>	integer	-	identifier of an elementary data file on UICC; mandatory for every command except STATUS
<P1>	integer	0	parameter passed on to the UICC; it is mandatory for every command except GET RESPONSE and STATUS
Value: ..... 0÷255 : parameter P1 passed on to the UICC in a command APDU .....			
<P2>	integer	0	parameter passed on to the UICC; it is mandatory for every command except GET RESPONSE and STATUS
Value: ..... 0÷255 : parameter P2 passed on to the UICC in a command APDU .....			
<P3>	integer	0	parameter passed on to the UICC; it is mandatory for every command except GET RESPONSE and STATUS
Value: ..... 0÷255 : parameter P3 passed on to the UICC in a command APDU .....			
<data>	string	-	information to be read from UICC or written to the UICC (hexadecimal character format).

Additional info:

►► Response data fields:





Name	Type	Default	Description
<sw1>	integer	-	information from the UICC about the execution of the actual command (successful or failed)
<sw2>	integer	-	information from the UICC about the execution of the actual command (successful or failed)
<response>	hex	-	on a successful completion of the previously issued command it shows the response data. It is not returned after a successful UPDATE BINARY or UPDATE RECORD command



AT+CRSM=?

Test command returns the OK result code

Read binary, ICCID(2FE2)

AT+CRSM=176,12258,0,0,10  
+CRSM: 144,0,982850702001107686F4  
OK

Read record, ADN(6F3A)

AT+CRSM=178,28474,1,4,40  
+CRSM: 144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFFFF06811056789282FFFFFFFFFFFFFFFF  
OK

Update Binary, KcGPRS(6F52)

AT+CRSM=214,28539,0,0,8,C69018C7958C87  
+CRSM: 144,0  
OK

Update Record, ADN(6F3A)

AT+CRSM=220,28474,9,4,30,657469FF  
FFFFFFFFFFFF  
+CRSM: 144,0  
OK

Status, FPLMN(6F7B)

AT+CRSM=242,28539  
+CRSM:144,0,623C820238218410A0000000871002FFFFFFFF89040300FA51180013181030



10A3282011E8304000030E08A01058B032F0609C6099001C0830101830181  
OK



## AT+CSIM - Generic SIM Access

This command sends a generic command to the UICC.



- [1] 3GPP TS 11.11
- [2] 3GPP TS 31.101
- [3] 3GPP TS 31.102

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CSIM=<length>,<command>

Set command transmits to the MT the <command>, it then shall send as it is to the UICC. As response to the command, MT sends back the actual UICC <response> to the TA as it is. The response message of the command is in the format:

+CSIM: <length>,<response>

Error case:

+CME ERROR: <err>

The response messages parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<length>	integer	-	characters number of the <command> sent to UICC (two times the actual length of the command)
<command>	string	-	command passed on by the MT to the UICC in the format as described in standard [1] or [2] (hexadecimal character format, refer to +CSCS)

Additional info:

- ▶▶ List of the meaning of the response messages parameters.



Name	Type	Default	Description
<length>	integer	-	characters number of the <response> sent to TE (two times the actual length of the response)
<response>	string	-	response to the command passed on by the UICC to the TE in the format as described in standard [1] or [2] (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 special form of the command has no effect and is kept only for backward compatibility.

Parameters:

<lock>=1 locking of the interface

<lock>=0 unlocking of the interface



- 2G SIM, see standard [1]:  
STATUS  
AT+CSIM=10,A0F2000016  
+CSIM:48,"000002A87F2002000000000000099300220800838A838A9000"  
OK  
  
SELECT EF 6F07  
AT+CSIM=14,A0A40000026F07  
+CSIM: 4,"9F0F"  
OK  
  
GET RESPONSE  
AT+CSIM=10,A0C000000F



```
+CSIM: 34,"000000096F0704001A001A010200009000"
OK
```

```
SELECT EF 6F30
AT+CSIM=14,A0A40000026F30
+CSIM: 4,"9F0F"
OK
```

[illegible]

# AT+CCHO - Open Logical Channel

## Open Logical Channel



3GPP TS 31.101

SIM Presence	Setting saved	Can be aborted
Required	No	No


**AT+CCHO=<dfname>**

Execution of the command causes the MT to return <sessionId> to allow the TE to identify a channel that is being allocated by the currently selected UICC, which is attached to ME.

The currently selected UICC will open a new logical channel; select the application identified by the <dfname> received with this command and return a <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 (hexadecimal character format; refer +CSCS).

Additional info:



<sessionId> returned by the +CCHO command.

Name	Type	Default	Description
------	------	---------	-------------



<sessionId> integer -

session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism.

Session Id is used when sending commands with Restricted UICC Logical Channel access +CRLA, or Generic UICC Logical Channel access +CGLA commands.



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. Refer to 3GPP TS 31.101.



AT+CCHO=?

Returns the OK result code.



## AT+CCHC - Close Logical Channel

Close a communication session.



3GPP TS 31.101

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CCHC=<sessionId>

Set 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 to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism.  <sessionId> is returned by the +CCHO command.



AT+CCHC=?

Test command returns the OK result code.





## AT+CGLA - Generic UICC Logical Channel Access

This command is used to control the currently selected UICC on the TE.



- [1] 3GPP TS 11.11
- [2] 3GPP TS 31.101
- [3] 3GPP TS 31.102

SIM Presence	Setting saved	Can be aborted
Required	No	No



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	-	this parameter is 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").  <sessionId> is returned by the +CCHO command.
<length>	integer	-	characters number of the <command> sent to UICC (two times the actual length of the command)



<command> string - command passed on by the MT to the UICC in the format as described in standard [1] or [2] (hexadecimal character format; refer to +CSCS).

Additional info:

►► List of the meaning of the response messages parameters.

Name	Type	Default	Description
<length>	integer	-	characters number of the <response> sent to TE (two times the actual length of the response)
<response>	string	-	response to the command passed on by the UICC to the TE in the format as described in standard [1] or [2] (hexadecimal character format)
<err>	string	-	error values (numeric format followed by verbose format)



AT+CGLA=?

Test command returns the OK result code.



## AT#VSIMSETPROF - Set Virtual SIM profile

This command selects which SIM has to be used, an external physical SIM or an internal Virtual SIM.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#VSIMSETPROF=<profId>[,<storeNewMode>]**

Execution command is used to switch between the physical SIM, connected via the external physical SIM interface, and the Virtual SIM application, that resides inside the module's software.

Parameters:

Name	Type	Default	Description
<profId>	integer	0	indicates the profile identifier.
Values: <div> <div>0 : profile 0 represents the external physical SIM</div> <div>1 : profile 1 represents the internal Virtual SIM application</div> </div>			
<storeNewMode>	integer	1	Flag to store <profId> selection in file system
Values: <div> <div>0 : do not store &lt;profId&gt; in file system</div> <div>1 : store &lt;profId&gt; in file system</div> </div>			



- ✚ Set, Read, Test commands return always immediate ERROR if Virtual SIM application is not present\corrupted or wrong key is present
- ✚ #VSIMSETPROF=1 returns immediate ERROR in case SIM profile is missing (i.e. #SECT, #SECP operations has not been performed yet )
- ✚ #VSIMSETPROF=0 returns immediate ERROR in case physical SIM is missing
- ✚ Expect 3 - 4 seconds delay when SIM switch is performed in warm status (module already running) from physical SIM, 2 seconds from Virtual SIM
- ✚ If request is performed immediately after AT parser availability, it can require 3 seconds more. If first response is ERROR please retry, it could be due to booting process. To avoid that, send a TEST command before
- ✚ Execution, Read and Test of #VSIMSETPROF command will not work and return ERROR in the first 15 seconds after the boot or reboot of the module



#### AT#VSIMSETPROF?

Read command reports the current value of parameter in the format:

#VSIMSETPROF: <profilId>

A special value of 255 indicates that the physical SIM is selected, but a SIM is not inserted



#### AT#VSIMSETPROF=?

Test command reports the supported range of values for the input parameter.



## AT#VSIMSTAT - Display general details of VSIM

This command displays the details associated with the VSIM.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT#VSIMSTAT

Execution command returns a range of information about the VSIM with the follow format:



#VSIMSTAT: <simos state>,<last error>,<perso>,<perso error>

Additional info:

#### Parameters description

Name	Type	Default	Description
<simos state>	integer	A	State of VSIM
Values: <div> <div>0</div> <div>:</div> <div>No SimOs present</div> </div> <div> <div>1</div> <div>:</div> <div>SimOs is present, but it is not running</div> </div> <div> <div>2</div> <div>:</div> <div>SimOs running</div> </div> <div> <div>3</div> <div>:</div> <div>SimOs disabled</div> </div> <div> <div>4</div> <div>:</div> <div>SimOs corrupted</div> </div> <div> <div>5</div> <div>:</div> <div>Generic fail</div> </div> <div> <div>6</div> <div>:</div> <div>SimOs timeout during startup</div> </div>			
<last error>	integer	0	last error



	Value:  ..... 0 : No error .....		
	<perso>	integer A	personalization file
	Values:  ..... 0 : No vsim_perso file present  1 : The vsim_perso file is present  2 : Error in the personalization file and presence of vsim_perso_err file .....		
	<perso error>	string A	personalization error
	Values:  ..... 0 : No vsim_perso file present  String : String taken from vsim_perso_err file .....		
<div> The value &lt;last error&gt; is always 0, because last error is not enabled until further enhancements</div>			
<div><div></div><div>AT#VSIMSTAT=? Test command returns OK.</div></div>			



## AT#VSIMVER - Get SIM version

This command returns the version of the Virtual SIM.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT#VSIMVER

Execution command returns the Virtual SIM version followed by an OK at Newline, or ERROR if the Virtual SIM is not present or not active



To get the version from AT#VSIMVER, it is only needed that the Virtual SIM is running



The return string from AT#VSIMVER is a hexadecimal string, e.g.:

#VSIMVER: "02040A0C02040A0C02"

Maximum length of the string is 66 chars.



### AT#VSIMVER=?

Test command returns OK.



## 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
Not required	No	No



### AT+ICCID

The command returns the following message:

+ICCID: <ICCID>



### AT+ICCID=?

Test command returns the OK result code.



```
AT#CCID
```

```
#CCID: 89861109091740011006
```

```
OK
```





## AT#SIMINCFG - SIMIN Pin Configuration

This command allows to configure a GPIO pin as SIMIN pin (detect switch of SIM holder) and the polarity of the SIMIN pin.



[1] Telit Hardware Design Guide of the used module

[2] SIM Integration Design Guide, 80000NT10001A

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#SIMINCFG=<GPIOPin>,<siminDetMode>

Set command allows to configure either a General Purpose I/O pin (GPIO) as SIMIN pin to detect the SIM presence, and its status according to the used SIM holder. Refer to document [1] to have information on the GPIO pins, see also document [2].




Parameters:

Name	Type	Default	Description
<GPIOPin>	integer	0	number of the GPIO pin used as SIMIN pin. The GPIO pin range starts from 1; 0 is used to reset #SIMINCFG settings, it is the default value.  0 is the only value allowed for ME910G1 family
Value:			
<div> <div>0</div> <div>:</div> <div>reset #SIMINCFG settings</div> </div>			
<siminDetMode>	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 and nano SIM holder) |

-  SIMIN pin works only if #SIMDET is set to 2 (Automatic SIM Detection).  
If SIMIN pin is not connected to the SIM Holder, do not use #SIMDET=2.
-  When <siminDetMode> is set to 0, an internal pull up is added to the pin.
-  When <siminDetMode> is set to 1, an internal pull down is added to the pin.



#### AT#SIMINCFG?

Read command reports the parameters values in the format:

#SIMINCFG: <GPIOPin>, <siminDetMode>



#### AT#SIMINCFG=?

Test command reports supported values of parameters <GPIOPin> and <siminDetMode>.



#### Modules supporting the command

ME310G1-

W1, WW



ML865G1-	WW
ME910G1-	W1, WW



On ML865G1 and ME310G1 families there is no dedicated SIMIN pin and AT#SIMDET=1 is the default value.

To use a TGPIO as SIMIN pin it has to be configured with: AT#SIMINCFG= (stored in NVM) and AT#SIMDET=2 (stored in the extended profile AT&P).



On ME910G1 family there is a dedicated SIMIN pin. So parameter <GPIOPin> is meaningless and can be set only to 0



## AT#SIMSELGPIOCFG - SIM Select

If the module has the SIM on Chip, this command allows to select SIM on Chip (eSIM) or external (plastic) SIM.

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No



AT#SIMSELGPIOCFG=<type>

Set command allows to activate eSIM or plastic SIM.

Parameter:

Name	Type	Default	Description
<type>	integer	1	SIM type
Values:			
<div> <div>0</div> <div>:</div> <div>eSIM</div> </div>			
<div> <div>1</div> <div>:</div> <div>plastic SIM</div> </div>			



AT#SIMSELGPIOCFG?

Read command reports the activated SIM, in the format:

#SIMSELGPIOCFG: <type>



AT#SIMSELGPIOCFG=?

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



## AT#FWAUTOSIM - Automatic Switch of Firmware Image by SIM

This command allows to set automatically the active firmware image in accordance with the inserted SIM.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#FWAUTOSIM=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	disable/enable automatic setting of active firmware image switch by SIM
Values:			
.....			
0	:	disable	
1	:	enable	
.....			



When automatic setting of active firmware image switch by SIM has been enabled (<mode>=1), system reboot is automatic only if active image must be changed to be in accordance with the inserted SIM. The #FWAUTOSIM command supports AT&T and Verizon SIMs.

See also #FWSWITCH command.



AT#FWAUTOSIM?

Read command returns the current setting in the format:



#FWAUTOSIM: <mode>



AT#FWAUTOSIM=?

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



This AT command causes a reboot



## AT#FIRSTNET - APN Automatic Switch by SIM

This command is the functionality to enable or disable APN automatic switch.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#FIRSTNET=<mode>**

This command allows to set APN automatic switch mode by SIM.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	Enable / Disable APN automatic switch by SIM
Values: <div> <div>0 : Disable APN automatic switch by SIM</div> <div>1 : Enable APN automatic switch by SIM</div> </div>			



This command is for AT&T (fwswitch 0); it allows to view an APN table for firstnet SIM that is different from showed APN table in case of a AT&T normal SIM.



**AT#FIRSTNET?**

Read command reports the current stored parameter:

#FIRSTNET: <mode>



**AT#FIRSTNET=?**

Test command reports the supported range of values for parameter:

#FIRSTNET: (0,1)



# SIM Toolkit





## 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
Required	Specific profile	No



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	<p>enables/disables SAT/USAT.</p> <p>In addition, &lt;mode&gt; parameter enables the:</p> <p>#STN URCs notifying the user that the SIM/USIM application has issued a proactive command. Some proactive commands require a user response</p> <p>#STN URCs that are the SIM/USIM device responses concerning actions initiated by the user, refer to Additional info section.</p> <p>If &lt;mode&gt;=2, the URC format depends on the &lt;cmdType&gt; as described in the Additional info sections. For &lt;cmdType&gt;, and all other URC parameters refer to #STGI command. The &lt;mode&gt; parameter values are listed below.</p>
Values:			
<div>0 : disable SAT/USAT</div>			



- |    |   |  |
|----|---|--|
| 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>  Follows the <timeout> range.
-----------	---------	---	---

Value:

1,2	:	timeout expressed in minutes
-----	---	------------------------------



## Additional info:

- ▶▶ <mode>=3, the URC has the following reduced format: #STN: <cmdType>
- ▶▶ <mode>=2, and <cmdType>=1 (REFRESH proactive command), the URC has the following extended format:  
#STN: 1,<refreshType>
- ▶▶ <mode>=2, and <cmdType>=5 (SET UP EVENT LIST proactive command), the URC has the following extended format:  
#STN: 5[,<eventListMask>]
- ▶▶ <mode>=2, and <cmdType>=16 (SET UP CALL proactive command), 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>=52 (RUN AT COMMAND)  
 <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 proactive command) fails, the #STN: 119 URC is sent to the module.
- ▶▶ <mode>=2, and <cmdType>=33 (DISPLAY TEXT proactive command), 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 proactive command), the URC has the following extended format:



#STN: 34,<cmdDetails>,<text>

- » <mode>=2, and <cmdType>=35 (GET INPUT proactive command), the URC has the following extended format:

#STN: 35,<cmdDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

- » <mode>=2, and <cmdType>=36 (SELECT ITEM proactive command), 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 proactive command), 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 proactive command), 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
------	------	-------------



<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
<p>✦ 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.</p> <p>✦ If AT#ENS=1, the &lt;mode&gt; parameter is set to 2.</p> <p>✦ Just one instance at a time, the one which first issued AT#STIA=&lt;mode&gt; (with &lt;mode&gt; not equal to 0), is allowed to issue SAT/USAT commands, and this is valid</p>		



till the same instance issues AT#STIA=0. After reboot, SAT/USAT can be used on another instance.



## 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	A	state of the sending of the SET UP MENU proactive command (37)
Values: <div> <div>0 : SIM/USIM has not sent the SET UP MENU proactive command (37)</div> <div>1 : SIM/USIM has sent the SET UP MENU proactive command (37)</div> </div>			
<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>.

---



## AT#STGI - SIM Toolkit Get Information

The #STGI 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
Not required	No	No



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, #STGI returns an ERROR message.

Parameter:

Name	Type	Default	Description
<cmdType>	integer	A	proactive command code. For each proactive command listed below, its #STGI 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

34      :  GET INKEY

35      :  GET INPUT

36      :  SELECT ITEM

37      :  SET UP MENU

40      :  SET UP IDLE MODE TEXT

```

Additional info:

►► <cmdType>=1 (REFRESH proactive command)  
 #STGI response format:  
 #STGI: 1,<refreshType>

Name	Type	Default	Description
<refreshType>	integer	A	identifies the refresh type
Values: <pre> 0      :  SIM Initialization and Full File Change            Notification  1      :  File Change Notification  2      :  SIM Initialization and File Change Notification           </pre>			



- 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 proactive command)

#STGI response format:

#STGI: 5,<eventListMask>

Name	Type	Default	Description
<eventListMask>	hex	A	<p>identifies the list of events to monitor.</p> <p>The &lt;eventListMask&gt; (two bytes long) is a bit mask where each bit, when set, indicates that the corresponding event must be monitored (e.g. if &lt;eventListMask&gt; is 0x0001, it means that MT call must be monitored).</p> <p>bit 0 = MT call</p> <p>bit 1 = Call connected</p> <p>bit 2 = Call disconnected</p> <p>bit 3 = Location status</p> <p>bit 4 = User activity</p> <p>bit 5 = Idle screen available</p> <p>bit 6 = Card reader status (if class "a" is supported)</p> <p>bit 7 = Language selection</p>



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 proactive command)

#STGI response format:

#STGI: 16,<cmdDetails>,[<confirmationText>],<calledNumber>

Name	Type	Default	Description
<cmdDetails>	integer	A	identifies the command details
Values: <div>             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           </div>			



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)

#STGI 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 proactive command)

#STGI response format:

#STGI: 33,<cmdDetails>[,<text>]

Name	Type	Default	Description
<cmdDetails>	hex	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 proactive command)

#STGI response format:

#STGI: 34,<cmdDetails>,<text>

Name	Type	Default	Description
<cmdDetails>	hex	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



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 proactive command)  
 #STGI response format:  
 #STGI: 35,<cmdDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

Name	Type	Default	Description
<cmdDetails>	hex	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: ..... 0x00÷0x8F : mask .....			
<text>	string	-	string as prompt for text
<responseMin>	integer	A	minimum number of characters of the user input
Value: ..... 0÷255 : minimum length of user input. .....			
<responseMax>	integer	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 proactive command)  
#STGI 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	A	<p>a bit mask where each bit position, according to its value, has a specific meaning:</p> <p>bit 0: 0 - presentation type is not specified 1 - presentation type is specified in bit 1</p> <p>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</p> <p>bit 2: 0 - no selection preference 1 - selection using soft key preferred</p> <p>bits 3-6: 0</p> <p>bit 7: 0 - no help information available 1 - help information available</p>
<p>Value:</p> <p>.....</p> <p>0x00÷0x87 : mask</p> <p>.....</p>			
<numOfItems>	integer	-	number of items in the list
<titleText>	string	-	menu title string
<itemId>	integer	A	item identifier
<p>Value:</p> <p>.....</p> <p>1÷numOfItems : item identifier range</p> <p>.....</p>			
<itemText>	string	-	item title string





<code>&lt;nextActionId&gt;</code>	integer	-	is the code of next proactive command to be issued upon execution of the menu item.
			If <code>&lt;nextActionId&gt;=0</code> , no next action information available.

▶▶ <cmdType>=37 (SET UP MENU proactive command)

### #STGI 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	A	<p>a bit mask where each bit position, according to its value, has a specific meaning:</p> <p>bit 0:  0 - no selection preference  1 - selection using soft key preferred</p> <p>bit 1-6:  0</p> <p>bit 7:  0 - no help information available  1 - help information available</p>
<p>Value:</p> <p>.....</p> <p>0x00÷0x81 : mask</p> <p>.....</p>			
<numOfItems>	integer	-	number of items in the list
<titleText>	string	-	menu title string


<itemId>	integer	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 proactive command)

#STGI 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?

The 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.



## 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
Required	No	No



AT#STSR=[<cmdType>[,<userAction>[,<data>]]]

The 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
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 proactive command)
- <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 proactive command).
- <data> contains the string of characters entered by the user.
- <cmdType>=36 (SELECT ITEM proactive command).
- <data> contains the item identifier selected by the user.
- 
- 📌 <userAction>=0 is used, for example, to
- accept a call when the ongoing proactive command is SET UP CALL,  
<cmdType>=16
  - start a connection when the ongoing proactive command is OPEN CHANNEL,  
<cmdType>=64





Use of icons is not supported. All icon related actions will respond with no icon available.



### AT#STSR?

The 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=?

The test command returns the range for the parameters <state> and <cmdType>.



## SMS & CB



# AT+CSMS - Select Message Service

Set command selects messaging service <service>



3GPP TS 27.005  
3GPP TS 23.040  
3GPP TS 23.041

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



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:			
<div> 0 : 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005 </div>			





1 : 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005. The requirement of <service> setting 1 is mentioned under corresponding command descriptions

Additional info:

►► Parameters meaning of the returned message.

Name	Type	Default	Description
<mt>	integer	0	mobile terminated messages support:
Values: <div>             0 : type not supported             1 : type supported           </div>			
<mo>	integer	0	mobile originated messages support
Values: <div>             0 : type not supported             1 : type supported           </div>			
<bm>	integer	0	broadcast type messages support



Values:

0 : type not supported

1 : type supported



AT+CSMS?

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

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



AT+CSMS=?

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



# 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
Required	Auto	No



AT+CPMS=<memr>[,<memw>[,<mems>]]

Set command selects memory storages <memr>, <memw> and <mems> to be used for reading, writing, sending and storing SMs

The command returns the memory storage status in the format:

+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>,<totals>

The returned parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<memr>	string	SM	memory from which messages are read and deleted
Values: <hr/> ME        :  SMS memory storage in Flash  SM        :  SIM SMS memory storage <hr/>			
<memw>	string	SM	memory to which writing and sending operations are made
Values: <hr/> ME        :  SMS memory storage in Flash <hr/>			



SM : SIM SMS memory storage			
.....			
<mems>	string	SM	memory to which received SMs are preferred to be stored
Values:			
.....			
ME	:	SMS memory storage in Flash	
SM	:	SIM SMS memory storage	
.....			

Additional info:

►► Here is the meaning of the parameters returned by the command.

Name	Type	Default	Description
<usedr>	integer	-	number of SMs stored in <memr>
<totalr>	integer	-	max number of SMs that <memr> can contain
<usedw>	integer	-	number of SMs stored in <memw>
<totalw>	integer	-	max number of SMs that <memw> can contain
<useds>	integer	-	number of SMs stored in <mems>
<totals>	integer	-	max number of SMs that <memw> can contain



#### AT+CPMS?

Read command reports the message storage status.

+CPMS:<memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>,<mems>,<useds>,<totals>

The parameters are described in previous sections.



**AT+CPMS=?**

Test command reports the supported values for parameters <memr>, <memw> and <mems>.

**AT+CPMS="SM","ME","SM"****+CPMS: 1,20,27, 50,1,20****OK****AT+CPMS?****+CPMS: "SM",1,20,"ME",27, 50,"SM",1,20****OK**

You have 1 out of 20 SMS SIM positions occupied



## 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
Required	Specific profile	No



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>.



## 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
Required	Other	No



**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	145	The type of number
Values: <div> <div>129 : National numbering scheme</div> <div>145 : International numbering scheme (contains the character "+")</div> </div>			



**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.





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
```





## 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 27.005  
3GPP TS 03.40/23.040  
3GPP TS 03.38/23.038

SIM Presence	Setting saved	Can be aborted
Required	Other	No



AT+CSMP=[<fo>[,<vp>[,<pid>[,<dc>]]]]

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	-	depending on the command or result code: first octet of 3GPP TS 03.40/23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format.
<vp>	mixed	-	depending on SMS-SUBMIT <fo> setting: 3GPP TS 03.40/23.040 TP-Validity-Period either in integer format (default 167) or in quoted time-string format.
<pid>	integer	-	3GPP TS 03.40/23.040 TP-Protocol-Identifier in integer format.
<dc>	integer	-	depending on the command or result code:  3GPP TS 03.38/23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme.



AT+CSMP?



Read command returns the current setting in the format:

+CSMP: <fo>,<vp>,<pid>,<dc>



AT+CSMP=?

Test command returns the OK result code.



The current settings are stored through +CSAS



If the First Octet (<fo>) and the Validity Period Format (<vp>) are not compatible with each other, the command response is still OK but the specifics parameters are discarded and the last valid configuration is kept:

AT+CSMP=40,"21/11/22,17:45:52+04",0,0

OK

AT+CSMP?

+CSMP: 17,167,0,0



Set the parameters for an outgoing message with 24 hours of validity period and default properties:

AT+CSMP=17,167,0,0

OK



## 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
Required	Specific profile	No



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:			
<div> <div>0</div> <div>:</div> <div>see Additional info section</div> </div>			
<div> <div>1</div> <div>:</div> <div>show the values in result codes</div> </div>			

Additional info:



If <show>=0

do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcsc>) 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:



+CSDH: <show>



AT+CSDH=?

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



## AT+CSAS - Save Settings

Execution command saves settings which have been made by the +CSCA, and +CSMP commands in local non-volatile memory.



3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CSAS[=<profile>]

Parameter:

Name	Type	Default	Description
<profile>	integer	0	Index of the profile where the settings are saved
Values:			
<p>0 : it saves the settings to NVM</p> <p>1÷n : SIM profile number; the value of &lt;n&gt; depends on the SIM.</p>			



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 (AT+CSAS<CR> is given) the settings are saved in the non-volatile memory.



AT+CSAS=?

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



## 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
Not required	No	No



AT+CRES[=<profile>]

Parameter:

Name	Type	Default	Description
<profile>	integer	A	Defines which message service profiles to restore.
Values:			
<p>0 : restores message service settings from NVM</p> <p>1÷n : restores message service settings from SIM. The n value depends on the SIM.</p>			



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>.



## 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
Required	No	No



AT+CMMS=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables the relay protocol link continuity.
Values:			
<p>0 : disable</p> <p>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 &lt;n&gt; is automatically reset to 0</p> <p>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 &lt;n&gt; remains set to 2)</p>			



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



AT+CMMS?



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



AT+CMMS=?

Test command returns the range of supported <n>





## 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
Not required	Specific profile	No

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: <div> <div>0</div> <div>: 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.</div> </div> <div> <div>1</div> <div>: Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved, otherwise forward them directly to the TE.</div> </div> <div> <div>2</div> <div>: 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.</div> </div> <div> <div>3</div> <div>: if &lt;mt&gt; is set to 1, it enables the hardware ring line for 1 sec.</div> </div>			
<mt>	integer	0	result code indication reporting for SMS-DELIVER.



#### Values:

- .....
- 0 : No SMS-DELIVER indications are routed to the TE and message is stored.
  - 1 : If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the URC described in Additional info section.
  - 2 : SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group) are routed directly to the TE using the URC described in the Additional info section.
  - 3 : Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.
- .....

<b>&lt;bm&gt;</b>	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.
- .....

<b>&lt;ds&gt;</b>	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)

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

+CBM:<sn>,<mid>,<dc>,<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)



<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
<dcsc>	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 <dcsc> 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 <dcsc> 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



<dc>	string	Data Coding Scheme
<pag>	integer	page number
<pags>	integer	total number of pages of the message
<data>	string	CBM Content of Message  If <dc> 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 <dc> 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



```
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
```



## 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
Not required	No	No



### 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[=[,]PDU is given

Either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network is possible. Parameter <n> defines which one will be sent. Optionally (when <length> is greater than zero) an acknowledgement TPDU (SMS-DELIVER-REPORT for RP-ACK or RP-ERROR) may be sent to the network. The entering of PDU is done similarly as specified in command Send Message +CMGS, except that the SMSC address field is not present.





Name	Type	Default	Description
<n>	integer	N/A	type of acknowledgement in PDU mode
Values: <div>             .....             <div>               0 : send RP-ACK without PDU (same as TEXT mode)             </div> <div>               1 : send RP-ACK with optional PDU message             </div> <div>               2 : send RP-ERROR with optional PDU message             </div> </div> .....			
<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.



✦ 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.

✦ It has been necessary to take the following decision to get over any incoherence problem, due to the possibility to have contemporaneous different settings of parameter <mt> and <ds> of the +CNMI command in different sessions (see #PORTCFG and +CMUX): only the <mt> and <ds> setting for session "0" are considered as valid to decide if +CNMA acknowledgment is expected or not.



- 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
06816000585426000480980600F170110370537284...
```

Send positive acknowledgement to the network.



AT+CNMA=0  
OK

Message is received from network.  
+CMT: "",70  
06816000585426000480980600F170110370537284...

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



## 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
Required	No	No



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: <div>             .....             <div>               0 : new message             </div> <div>               1 : read message             </div> <div>               2 : stored message not sent yet             </div> <div>               3 : stored message already sent             </div> <div>               4 : all messages             </div> </div> .....			

►► 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:			
<hr/>			
"REC UNREAD" : new message			
"REC READ" : read message			
"STO UNSENT" : stored message not sent yet			
"STO SENT" : stored message already sent			
"ALL" : all messages			
<hr/>			

►► 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>
Values: <div>             .....             <div>               129 : number in national format             </div> <div>               145 : number in international format (contains the "+")             </div>             .....           </div>			
<length>	integer	-	text length
<data>	string	-	TP-User-Data  If <dc> 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 <dc> 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



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



## 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
Required	No	No



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
Values: <div>             .....             <div>               0 : new message             </div> <div>               1 : read message             </div> <div>               2 : stored message not yet sent             </div> <div>               3 : stored message already sent             </div>             .....           </div>			
<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>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data>
```

If there is either a sent or an unsent message in location <index> the output format is:

```
+CMGR:<stat>,<da>,<alpha> [,<toda>,<fo>,<pid>,<dc>,<vp>],<sca>,<tosca>,<length>]<CR><LF><data>
```

If there is a Message Delivery Confirm message in location <index> the output format is:

```
+CMGR: <stat>,<fo>,<mr>,,,<scts>,<dt>,<st>
```

Name	Type	Default	Description
<stat>	string	N/A	status of the message
Values: <div> "REC UNREAD" : new received message  "REC READ" : received message read  "STO UNSENT" : message stored not yet sent  "STO SENT" : message stored already sent </div>			
<fo>	integer	-	first octet of the message PDU
<mr>	integer	-	message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format



<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
<dc>	integer	-	Data Coding Scheme
<vp>	mixed	-	<p>Validity Period; its format depends on SMS-SUBMIT &lt;fo&gt; setting (see +CPMS):</p> <ol style="list-style-type: none"> <li>1. Not present: if &lt;fo&gt; tells that Validity Period Format is not present</li> <li>2. Integer: if &lt;fo&gt; tells that Validity Period Format is relative</li> <li>3. Quoted time-string type: if &lt;fo&gt; tells that Validity Period Format is absolute</li> <li>4. Quoted hexadecimal representation of 7 octets: if &lt;fo&gt; tells that Validity Period Format is enhanced</li> </ol>
<oa>	string	-	Originator address, represented in the currently selected character set (see +CSCS).
<da>	string	-	Destination address, represented in the currently selected character set (see +CSCS).
<alpha>	string	-	The alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
<sca>	string	-	Service Centre Address
<tooa>	integer	N/A	type of number of <oa>
Values:			



			<div> 129 : number in national format </div> <div> 145 : number in international format (contains the "+") </div>
<tda>	integer	N/A	type of number of <da>
			Values: <div> 129 : number in national format </div> <div> 145 : number in international format (contains the "+") </div>
<tosca>	integer	N/A	type of number of <sca>
			Values: <div> 129 : number in national format </div> <div> 145 : number in international format (contains the "+") </div>
<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 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)



In both cases (in PDU or Text mode) if status of the message is 'received unread', status in the storage changes to 'received read'.



AT+CMGR=?

Test command returns the OK result code



```
AT+CMGF=0
OK
```

```
AT+CMGR=1
+CMGR:2,,21
079128019291903011640A8110516529700000A709027A794E77B95C2E
OK
```

```
AT+CMGF=1
OK
```

```
AT+CMGR=3
+CMGR:"REC READ", "+821020955219", "07/07/19,10:06:34+36" test message/.....
OK
```



## 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
Required	Auto	No



### 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
<length>	integer	N/A	length in bytes of the PDU to be sent (excluding the SMSC address octets)
Value:			
<div> <div>7÷164</div> <div>:</div> <div>number of bytes</div> </div>			

►► 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 <dc> (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 <dc> (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
Values: <div> <div>129 : number in national format</div> <div>145 : number in international format (contains the "+")</div> </div>			

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 10 SMS; the maximum number of chars depends on the <dc>:
  - 2448 chars
  - 2144 chars if 8-bit is used
  - 1072 chars if UCS2 is used
- ✦ If message sending fails for some reason, then an error code is reported.



AT+CMGS=?

Test command returns the OK result code.

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



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



```
AT+CMGS=18
> 088128010099010259115507811020905512F90000A704F4F29C0E
+CMGS: 124
OK
```

```
Set text mode
AT+CMGF=1
AT+CSMP=17,167,0,0
AT+CMGS="01090255219",129
>TEST MESSAGE
+CMGS:125
OK
```



## 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
Required	No	No



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
Values: <div>             .....             <div>               129 : number in national format             </div> <div>               145 : number in international format (contains the "+")             </div>             .....           </div>			

Additional info:



►► If message is successfully sent to the network then the result is sent in the format:  
+CMSS: <mr>  
where:  
<mr> - message reference number.  
If message sending fails for some reason, an error code is reported:  
+CMS ERROR:<err>

📌 To store a message in the <memw> storage see command +CMGW.

📌 Care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.



AT+CMSS=?

Test command returns the OK result code.

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



## 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
Required	Auto	No



### 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
<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 <dc> (see +CSMP) indicates that GSM03.38/23.038 default alphabet is used and current <fo> (see +CSMP) indicates that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to 3GPP TS 27.005, Annex A; backspace can be used to delete last character and carriage returns can be used..

if current <dc> (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).
<tda>	integer	N/A	type of destination address
Values: <div>             .....             <div>               129 : number in national format             </div> <div>               145 : number in international format (contains the character "+")             </div> </div> .....			







<stat>	string	N/A	message status
--------	--------	-----	----------------

Values:

"REC UNREAD"	:	new received message unread
"REC READ"	:	received message read
"STO UNSENT"	:	message stored not yet sent (default)
"STO SENT"	:	message stored already sent


Unsolicited field:

Name	Type	Description
<index>	integer	message location index in the memory <memw> (see +CPMS). If message storing fails for some reason, an error code is reported.

-  The DCD signal shall be in ON state while <data> is entered. The echoing of <data> is controlled by echo command E.
-  In PDU mode, not only SUBMIT messages can be stored in SIM, but also DELIVER and STATUS REPORT messages (3GPP TS 23.040 SMS-STATUS-REPORT messages). SUBMIT messages can only be stored with status 2 or 3; DELIVER and STATUS REPORT messages can only be stored with status 0 or 1.
-  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 10 SMs; the maximum number of chars depends on <dcs>:




2448 chars  
2144 chars if 8-bit is used  
1072 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.



AT+CMGF=0      set PDU mode  
OK

AT+CMGW=18  
> 088128010099010259115507811020905512F90000A704F4F29C0E  
+CMGW: 29  
OK



```
AT+CMGF=1      set text mode
OK
```

```
AT+CSMP=17,167,0,0
OK
```

```
AT+CSCA="821029190903",145
OK
```

```
AT+CMGW="0165872928"
> test message...
+CMGW: 28
```



## AT+CMGD - Delete Message

This command allows to delete from memory messages.



3GPP TS 27.005

SIM Presence	Setting saved	Can be aborted
Required	No	No



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 form 1 to N, where N depends on the available space in the selected storage (see +CPMS)
<delflag>	integer	0	Type of multiple message deletion
<p>Values:</p> <p>0 : delete message specified in &lt;index&gt;</p> <p>1 : delete all read messages from selected storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched</p> <p>2 : delete all read messages from selected storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched</p>			



3 : delete all read messages from selected storage, sent and unsent mobile originated messages, leaving unread messages untouched

4 : delete all messages from selected storage.



If <delflag> is present and not set to 0 then, if <index> is greater than 0, <index> is ignored and the command follows the rules for <delflag> shown above.



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



## 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
Required	Auto	No



AT+CGSMS=[<service>]

Parameter:

Name	Type	Default	Description
<service>	integer	1	indicates the service or service preference to be used
<p>Values:</p> <p>0 : GPRS</p> <p>1 : circuit switched</p> <p>2 : GPRS preferred. Use circuit switched if SMS via GPRS service not available or GPRS not registered.</p> <p>3 : circuit switched preferred. Use GPRS if SMS via circuit switched not available.</p>			



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>



**AT+CGSMS=?**

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



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





## AT#SMSMODE - SMS Commands Operation Mode

SMS Commands Operation Mode.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#SMSMODE=<mode>**

Set command enables/disables the check for presence of SMS Service Centre Address (SCA) in the Fixed Dialing Number (FDN) phonebook.

Parameter:

Name	Type	Default	Description
<mode>	integer	1	Enables/disables the check for presence of SCA in FDN phonebook.
<p>Values:</p> <p>1 : Disables the check for presence of SCA in FDN phonebook.</p> <p>2 : Enables the check for presence of SMS SCA in the FDN phonebook when FDN are enabled. If the SMS SCA is not present a SMS cannot be sent.</p>			



**AT#SMSMODE?**

Read command reports whether the check of SMS SCA in FDN phonebook is enabled or not, in the format:

#SMSMODE: <mode>



**AT#SMSMODE=?**

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



## AT#SMSRETRY - SMS Retry

Set command configures the total retry period and the retry interval to successfully send an SMS.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#SMSRETRY=<total\_retry\_period>[,<retry\_interval>]

Parameters:

Name	Type	Default	Description
<total_retry_period>	integer	N/A	indicates the total retry period in seconds
Value:			
0÷255 : retry period in seconds			
<retry_interval>	integer	N/A	indicates the retry interval in seconds
Value:			
0÷255 : retry interval in seconds			



AT#SMSRETRY?

Read command returns the current parameters setting for #SMSRETRY command in the format:

#SMSRETRY: <total\_retry\_period>,<retry\_interval>





AT#SMSRETRY=?

Test command reports the supported range of values for parameters



## AT#SMSSECENA - Secure SMS Enable/Disable

Secure SMS Management Enable/Disable.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#SMSSECENA=<action>**

Set command enables/disables the secure SMS management.

Parameters:

Name	Type	Default	Description
<action>	integer	1	Enable/Disable the secure SMS management
Values:			
.....			
0	:	Disable the secure SMS management	
1	:	Enable the secure SMS management	
.....			



**AT#SMSSECENA?**

Read command reports whether the secure SMS management is enabled or not, in the format:

#SMSSECENA: <action>



**AT#SMSSECENA=?**

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



## AT#CMGLCONCINDEX - Report Concatenated SMS Indexes

The command reports list of all concatenated SMS

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#CMGLCONCINDEX

The command reports a line for each concatenated SMS containing:

#CMGLCONCINDEX: <N>,<i>,<j>,<k>,...

If no concatenated SMS is present on the SIM, only OK result code will be returned.

The parameters are described in the Additional info section.

Additional info:

►► Here is the meaning of the parameters returned by the command.

Name	Type	Default	Description
<N>	integer	-	Number of segments that form the whole concatenated SMS.
<i>	integer	-	index of the first SMS segment. 0 if segment has not been received.
<j>	integer	-	index of the second SMS segment. 0 if segment has not been received.
<k>	integer	-	index of the third SMS segment 0 if segment has not been received
<...>	integer	-	index of the next SMS segment ...



### AT#CMGLCONCINDEX=?

Test command returns OK result code.



&lt;/&gt;

- Example of 2 concatenated SMS:  
First composed by 3 segments: 1,2,3, but segment 0 not received yet.  
Secondo composed by segments: 4,5,6,7,8, but segment 7 not received yet.  
AT#CMGLCONCINDEX  
#CMGLCONCINDEX: 3,0,2,3  
#CMGLCONCINDEX: 5,4,5,6,0,8  
OK



## AT#E2SMSRI - SMS Ring Indicator

This set command enables/disables the Ring Indicator pin response to an incoming SMS message. If enabled, a negative going pulse is generated when receiving an incoming SMS message.

SIM Presence	Setting saved	Can be aborted
Required	Common profile	No



AT#E2SMSRI=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	RI enabling
Values:			
<div> <div>0</div> <div>:</div> <div>disables RI pin response for incoming SMS messages</div> </div>			
<div> <div>50÷1150</div> <div>:</div> <div>enables RI pin response for incoming SMS. The value of &lt;n&gt; is the duration in ms of the pulse generated on receipt of an incoming SMS.</div> </div>			



If +CNMI=3,1 command is issued, and the module is in a GPRS connection, a 100 ms break signal is sent and a 1 sec. pulse is generated on RI pin, no matter if the RI pin response is either enabled or not.



AT#E2SMSRI?

Read command reports the duration in ms of the pulse generated on receipt of an SMS, in the format:

#E2SMSRI: <n>



<n>=0 means that the RI pin response to an incoming SMS is disabled



AT#E2SMSRI=?



Reports the range of supported values for parameter <n>





## AT#SMOV - SMS Overflow

The command is used to enable the SMS overflow signaling functionality.

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



AT#SMOV=[<mode>]

Set command enables the SMS overflow signaling function. If enabled, URC code is:

#SMOV: <memo>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	signaling functionality mode
Values:			
<div> <div>0</div> <div>:</div> <div>disables SMS overflow signaling function</div> </div>			
<div> <div>1</div> <div>:</div> <div>enables SMS overflow signaling function</div> </div>			

Unsolicited field:

Name	Type	Description
<memo>	string	<memo> is a string indicating the SMS storage that has reached the maximum capacity
Values:		
<div> <div>"SM"</div> <div>:</div> <div>SIM Memory</div> </div>		
<div> <div>"ME"</div> <div>:</div> <div>NVM SMS Storage</div> </div>		





When the maximum storage capacity has been reached, if enabled, a network-initiated notification is sent.



AT#SMOV?

Read command reports whether the SMS overflow signaling function is currently enabled or not, in the format:

#SMOV: <mode>



AT#SMOV=?

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



## AT#SMSMOVE - Move Short Message to other Memory

This command moves selected Short Message from current memory to destination memory.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#SMSMOVE=<index>**

Execution command moves selected Short Message from current memory to destination memory.

Parameter:

Name	Type	Default	Description
<index>	string	-	message index in the memory selected by +CPMS command. It can have values form 1 to N, where N depends on the available space, see +CPMS.



If the destination memory is full, an error is returned



**AT#SMSMOVE?**

Read command reports the message storage status of the current memory and the destination memory in the format:

#SMSMOVE:<curr\_mem>,<used\_curr\_mem>,<total\_curr\_mem>,<dest\_mem>,<used\_dest\_mem>,<total\_dest\_mem>

Additional info:



Parameters:

Name	Type	Default	Description
<curr_mem>	string	A	current memory, selected by +CPMS command



Values:			
.....			
SM	:	SIM SMS memory storage	
ME	:	NVM SMS storage	
.....			
<used_curr_mem>	integer	-	number of SMs stored in the current memory
<total_curr_mem>	integer	-	max number of SMs that the current memory can contain
<dest_mem>	string	SM	destination memory
Values:			
.....			
SM	:	SIM memory	
ME	:	device memory	
.....			
<used_dest_mem>	integer	-	number of SMs stored in the destination memory
<total_dest_mem>	integer	-	max number of SMs that the destination memory can contain



AT#SMSMOVE=?

Test command reports the supported values for parameter <index>



AT#SMSMOVE?

#SMSMOVE: "ME",3,100,"SM",0,50

OK

The current memory is ME where 3 SMSs are stored; the destination memory is SIM that is empty

AT+CMGL=ALL



+CMGL: 1,"STO UNSENT","32XXXXXXXXX","",

Test 1

+CMGL: 2,"STO UNSENT","32XXXXXXXXX","",

Test 2

+CMGL: 3,"STO UNSENT","32XXXXXXXXX","",

Test 3

OK

List the SMs to discover the memory index

AT#SMSMOVE=1

OK

Move the SM in the first position of ME to SIM

AT#SMSMOVE?

#SMSMOVE: "ME",2,100,"SM",1,50

OK

Now we have 2 SMs in ME and 1 in SIM



## Phonebook



## AT+CPBS - Select Phonebook Memory Storage

This set command selects phonebook memory storage, which will be used by other phonebook commands.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No







AT+CPBS=<storage>[,<password>]

Parameters:

Name	Type	Default	Description
<storage>	string	"SM"	specify the phonebook memory storage
Values:			
"SM"	:	SIM phonebook	
"FD"	:	SIM fixed dialing-phonebook (FDN)(only phase 2+ SIM)	
"LD"	:	SIM last-dialing-phonebook (+CPBF is not applicable for this storage)	
"MC"	:	device missed (unanswered received) calls list (+CPBF is not applicable for this storage)	
"RC"	:	ME received calls list (+CPBF is not applicable for this storage)	
"MB"	:	mailbox numbers stored on SIM; it is possible to select this storage only if the mailbox service is provided by the SIM (see #MBN)	
"DC"	:	ME last-dialing-phonebook (+CPBF is not applicable for this storage)	



	<p>"ME" : ME phonebook</p> <p>"EN" : SIM emergency numbers phonebook (+CPBW and +CPBF not applicable for this storage)</p> <p>"ON" : SIM own numbers (MSISDNs) phonebook (+CPBF is not applicable for this storage)</p> <p>"SD" : SIM Service Dialing Numbers (SDN) phonebook (+CPBW is not applicable for this storage)</p> <p>.....</p>	
	<p>&lt;password&gt; string - string type value representing the PIN2-code required when selecting PIN2-code locked &lt;storage&gt; above "FD".</p> <p>if &lt;password&gt; 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.</p> <p>.....</p>	
	<p> 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.</p> <p>The command does not deactivate "SM" phonebook, and does not activate FDN.</p> <p>.....</p>	
	<p><b>AT+CPBS?</b></p> <p>Read command returns the actual values of the parameter &lt;storage&gt;, the number of occupied records &lt;used&gt; and the maximum index number &lt;total&gt;, in the format:</p> <p>+CPBS: &lt;storage&gt;,&lt;used&gt;,&lt;total&gt;</p> <p>.....</p>	
	<p> For &lt;storage&gt;="MC": if there are more than one missed calls from the same number the read command will return only the last call.</p> <p>.....</p>	
	<p><b>AT+CPBS=?</b></p> <p>Test command returns the supported range of values for the parameter &lt;storage&gt;</p>	



## AT+CPBR - Read Phonebook Entries

The command reads phonebook entries.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	No	No

AT+CPBR=<index1>[,<index2>]

Execution command returns phonebook entries in location number range <index1>..<<index2> from the current phonebook memory storage selected with +CPBS. If <index2> is omitted, only location <index1> is returned.

The intermediate response format is:

```
[+CPBR:<index1>,<number>,<type>,<text>[,<hidden>][,<group>]
[,<adnumber>][,<adtype>][,<secondtext>][,<email>]]
```

...

```
[<CR><LF> +CPBR:<index2>,<number>,<type>,<text>[,<hidden>]
[,<group>][,<adnumber>] [,<adtype>][,<secondtext>][,<email>]]]
```

Parameters:

Name	Type	Default	Description
<index1>	integer	-	value in the range of location numbers of the currently selected phonebook memory storage (see +CPBS).
<index2>	integer	-	value in the range of location numbers of the currently selected phonebook memory storage (see +CPBS).

Additional info:



## ▶▶ Intermediate response parameters

Name	Type	Default	Description
<indexn>	integer	-	the location number of the phonebook entry
<number>	string	-	phone number of format <type>
<type>	integer	N/A	type of phone number octet
Values: <div>             .....             <div>               129 : national numbering scheme             </div> <div>               145 : international numbering scheme (contains the character "+")             </div>             .....           </div>			
<test>	string	-	the alphanumeric text associated to the number; character set as specified by command Select TE Character Set +CSCS
<hidden>	integer	0	indicates if the entry is hidden or not
Values: <div>             .....             <div>               0 : phonebook entry not hidden             </div> <div>               1 : phonebook entry hidden             </div>             .....           </div>			
<group>	string	-	the group the entry may belong to; character set as specified by command Select TE Character Set +CSCS



<adnumber>	string	-	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 address; 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 will be returned, while if listing fails in an ME error, +CME ERROR: <err> is returned.

### AT+CPBR=?

Test command returns the supported range of values for parameters <indexn> and the maximum lengths of <number>, <text>, <group>, <secondtext> and <email> string parameters, in the format:  
+CPBR: (<minIndex> - <maxIndex>),<nlength>,<tlength>,<glength>,<slength>,<elength>

Additional info:

#### ►► Test command response parameters

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



<maxIndex>	integer	-	the maximum <index> number
<nlength>	integer	-	maximum <number> field length
<tlength>	integer	-	maximum <name> field length
<glength>	integer	-	maximum <group> field length
<slength>	integer	-	maximum <secondtext> field length
<elength>	integer	-	maximum <email> field length



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+CPBF - Find Phonebook Entries

This command returns phonebook entries.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Other	No



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; used character set should be the one selected with command +CSCS.

Additional info:

►► The command returns a report in the form:

```
[+CPBF:<index1>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>]
[,<adtype>][,<secondtext>][,<email>]<CR><LF>
+CPBF:<index2>,<number>,<type>,<text>[,<hidden>][,<group>][,<adnumber>]
[,<adtype>][,<secondtext>][,<email>][...]]]
```

Name	Type	Default	Description
------	------	---------	-------------



<indexn>	integer	-	The location number of the phonebook entry
<number>	string	-	Phone number of format <type>
<type>	integer	N/A	type of phone number octet
Values: ..... 129 : national numbering scheme 145 : international numbering scheme (contains the character "+") .....			
<text>	string	-	The alphanumeric text associated to the number; the character set used should be the one selected with command +CSCS
<group>	string	-	Field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
<adnumber>	string	-	additional number; phone number of format <adtype>
<adtype>	integer	-	type of address octet
<secondtext>	string	-	Field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
<email>	string	-	field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
<hidden>	string	N/A	indicates if the entry is hidden or not



#### Values:

0 : phonebook entry not hidden

1 : phonebook entry hidden

- ✦ +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 reports the maximum lengths of <number> and <text> fields, in the format:

+CPBF: <nlength>,<tlength>,<glength>,<slength>,<elength>

Additional info:

#### ▶▶ Test command response fields

Name	Type	Default	Description
<nlength>	integer	-	Maximum length of field <number>



<tlength>	integer	-	Maximum length of field <text>
<glength>	integer	-	Maximum length of field <group>
<slength>	integer	-	Maximum length of field <secondtext>
<elength>	integer	-	Maximum length of field <email>



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 - Write Phonebook Entry

This command writes phonebook entry in the current phonebook memory.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Other	No



AT+CPBW=[<index>][,<number>[,<type>[,<text>[,<group>[,<adnumber>[,<adtype>[,<secondtext>[,<email>[,<hidden>]]]]]]]]]

Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

Parameters:

Name	Type	Default	Description
<index>	integer	-	value in the range of location numbers of the currently selected phonebook memory storage (see +CPBS)
<number>	string	-	phone number in the format <type>
<type>	integer	129	type of number
<p>Values:</p> <p>.....</p> <p>129 : national numbering scheme</p> <p>145 : international numbering scheme (contains the character "+")</p> <p>.....</p>			



<text>	string	-	text associated to the number; used character set should be the one selected with command +CSCS
<group>	string	-	string type field of maximum length <glength> indicating a group the entry may belong to; character set as specified by command Select TE Character Set +CSCS
<adnumber>	string	-	additional number; string type phone number of format <adtype>
<adtype>	integer	-	type of address octet
<secondtext>	string	-	string type field of maximum length <slength> indicating a second text field associated with the number; character set as specified by command Select TE Character Set +CSCS
<email>	string	-	field of maximum length <elength> indicating an email address; character set as specified by command Select TE Character Set +CSCS
<hidden>	integer	0	indicates if the entry is hidden or not
<p>Values:</p> <p>.....</p> <p>0 : phonebook entry not hidden</p> <p>1 : phonebook entry hidden</p> <p>.....</p>			



If record number <index> already exists, it will be overwritten.



If either <number>, <type> and <text> are omitted, the phonebook entry in location <index> is deleted.



- ✦ If either "LD", "MC" or "RC" memory storage has been selected (see +CPBS) it is possible just to delete the phonebook entry in location <index>, therefore parameters <number>, <type> and <text> must be omitted.
- ✦ Before defining <group> string, it is recommended to check, with #CPBGR command, the predefined group names, that could be already stored in USIM in Grouping information Alpha String (GAS) file. If all records in such file are already occupied, +CPBW command will return ERROR when trying to use a new group name that is not in the predefined GAS names. To define a new custom group string, it is necessary to overwrite with it one of the old predefined strings, using #CPBGW command.



### AT+CPBW=?

Test command returns location range supported by the current storage as a compound value, the maximum length of <number> field, supported number format of the storage and maximum length of <text> field. The format is:

+CPBW: (list of supported <index>s),<nlength>,(list of supported <type>s),<tlength>,<glength>,<slength>,<elength>

Additional info:

#### ▶▶ Test command response fields

Name	Type	Default	Description
<nlength>	integer	-	Maximum length of field <number>
<tlength>	integer	-	Maximum length of field <text>
<glength>	integer	-	Maximum length of field <group>
<slength>	integer	-	Maximum length of field <secondtext>
<elength>	integer	-	Maximum length of field <email>





the value of <nlength> could vary, depending on the availability of Extension service, in the following situations:

1. if "SM" memory storage has been selected (see +CPBS) and the SIM supports the Extension1 service
2. if "FD" memory storage has been selected (see +CPBS) and the SIM supports the Extension2 service
3. if "MB" memory storage has been selected (see +CPBS) and the SIM supports the Extension6 service



Remember to select the PB storage with +CPBS command before issuing PB commands.



if <index> is omitted or <index>=0, the number <number> is stored in the first free phonebook location.

```
AT+CPBW=0,"+39040X192YZ1",129,"Text"
```

```
AT+CPBW=,"+39040X192YZ1",129,"Text"
```



## AT#CPBGR - Read Group Entries

This command returns Grouping information Alpha String (GAS) USIM file entries.

SIM Presence	Setting saved	Can be aborted
Required	No	No



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	N/A	first location to be read
Value: <div> minIndex÷maxIndex : range of location numbers of GAS, where "minIndex" and "maxIndex" can be obtained by issuing the test command </div>			
<indexLast>	integer	N/A	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:

▶▶ 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<sub>n</sub>> and the maximum length of <text<sub>n</sub>> 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



## 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
Required	No	No



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)



## AT#CPBD - Delete All Phonebook Entries

This command deletes all phonebook entries.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



### AT#CPBD

This execution command deletes all phonebook entries in the current phonebook memory storage selected with +CPBS.



### AT#CPBD=?

Test command returns OK result code.



## Time & Alarm



## AT+CCLK - Clock Management

The command is related to real time clock management.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



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"
<p>Values:</p> <hr/> <p>yy : year (two last digits are mandatory), range is 00..99</p> <p>MM : month (two digits are mandatory), range is 01..12</p> <p>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.</p> <p>hh : hour (two digits are mandatory), range is 00..23</p> <p>mm : minute (two digits are mandatory), range is 00..59</p>			



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

±ZZ : time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two digits are mandatory), range is -96...+96



Warning: any real-time clock settings will be lost if the set command is sent between a power on and a reboot/shutdown command (for example: AT#REBOOT, AT#FASTSHDN, AT#SHDN) and if the reboot occurs within 60 seconds from the power on.



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
```



## AT+CALA - Alarm Management

This command is related to the alarm management.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT+CALA=<time>[,<n>[,<type>[,<text>[,<recur>[,<silent>]]]]]**

Set command stores in the internal Real Time Clock of the module an alarm time with respective settings.

It is possible to set up a recurrent alarm for one or more days in the week.

Currently just one alarm can be set.

Alarms are not supported after disconnecting from power. Coin cell are supported. In case of a power cut, alarm will be deleted and needs to be re-set.

When the RTC time reaches the alarm time then the alarm starts, the behavior of the module depends on the setting <type> and if the module was already ON at the moment when the alarm time had come.

Parameters:

Name	Type	Default	Description
<time>	string	-	current alarm time as quoted string in the format:  "yy/MM/dd,hh:mm:ss±zz"  Refer to +CCLK for the string meaning. Empty string (+CALA="") deletes the current alarm and resets all the +CALA parameters to the factory default configuration.



"hh:mm:ss±zz" string must be used only when issuing +CALA with parameter <recurr>.			
<n>	integer	0	index of the alarm
Value: ..... 0 : the only value supported .....			
<type>	integer	1	alarm behavior type
Values: ..... 0 : reserved  1 : the module wakes up fully operative as if the ON/OFF button has been pressed. If the module is already ON when the alarm times out, then it does nothing.  2÷8 : see Additional info section. .....			
<text>	string	-	alarm code text string used in the URC +CALA. It has meaning only if <type> is equal to 2, 5 or 6.
<recurr>	string	N/A	sets a recurrent alarm for one or more days in the week in the following format:  "<1..7>[,<1..7>[, ... ]]"
Values: ..... 0 : all days in the week			



1	:	Monday
2	:	Tuesday
3	:	Wednesday
4	:	Thursday
5	:	Friday
6	:	Saturday
7	:	Sunday
.....		
<silent>	integer	N/A indicates if the alarm is silent or not
Values:		
.....		
0	:	the alarm is not silent
1	:	the alarm is silent
.....		

#### Additional info:

##### ►► <type>=2

The module wakes up in "alarm mode" if at the alarm time it was powered OFF, otherwise it remains fully operative. In both cases the module issues an unsolicited code every 3 s:

+CALA: <text>

Where <text> is the +CALA optional parameter previously set.

The module keeps on sending the unsolicited code every 3 s until a #WAKE or #SHDN command is received or a 90 seconds timer expires. If the module is in "alarm mode" and it does not receive the #WAKE command within 90s then it shuts down.





►► <type>=3

The module wakes up in "alarm mode" if at the alarm time it was powered OFF, otherwise it remains fully operative. In both cases the module starts playing the alarm tone on the selected path for the ringer (see command #SRP).

The module keeps on playing the alarm tone until a #WAKE or #SHDN command is received or a 90 s time-out occurs. If the device is in "alarm mode" and it does not receive the #WAKE command within 90s then it shuts down.

If alarm expires during a call alarm sound will stop when the call is disconnected.

►► <type>=4

The module wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the module brings the alarm pin high, provided that one has been set (using #ALARMPIN or #GPIO) and keeps it in this state until a #WAKE or #SHDN command is received or a 90 seconds timer expires. If the device is in "alarm mode" and it does not receive the #WAKE command within 90s then it shuts down.

►► <type>=5

The module will make both the actions as for <type>=2 and <type>=3.

►► <type>=6

The module will make both the actions as for <type>=2 and <type>=4.

►► <type>=7

The module will make both the actions as for <type>=3 and <type>=4.

►► <type>=8

The module wakes up in "alarm mode" if at the alarm time it was off, otherwise it remains fully operative. In both cases the module sets high the RI output pin. The RI output pin remains high until next #WAKE issue or until a 90s timer expires. If



the device is in "alarm mode" and it does not receive the #WAKE command within 90s. After that it shuts down.



The "alarm mode" is indicated by hardware pin CTS to the ON status and DSR to the OFF status, while the "power saving" status is indicated by a CTS - OFF, DSR - OFF and USB\_VBUS - OFF status. The normal operating status is indicated by DSR - ON or USB\_VBUS - ON status.

During the "alarm mode" the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SMS.

The only commands that can be issued to the module in this state are the #WAKE and #SHDN, every other command must not be issued during this state.



#### AT+CALA?

Read command returns the list of current active alarm settings in the device, in the following format:

[+CALA: <time>,<n>,<type>,<[text]>,<recurr>,<silent>]

Note: on READ command <time> does not include the time zone.



#### AT+CALA=?

Test command returns the list of supported index values, alarm types, maximum length of the text to be displayed in the URC +CALA, maximum length of <recurr> and supported <silent>s, in the format:

+CALA: (list of supported <n>s),(list of supported <type>s),<tlength>,<rlength>,(list of supported <silent>s)

Additional info:



Parameters:

Name	Type	Default	Description
------	------	---------	-------------



<tlength>	string	-	maximum length of <text> parameter
<rlength>	string	-	maximum length of <recurr> parameter

&lt;/&gt;

```
AT+CALA="02/09/07,23:30:00+00"  
OK
```



# AT+CAPD - Postpone Alarm

Set command postpones or dismisses a currently active alarm.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT+CAPD=[<sec>]

Parameter:

Name	Type	Default	Description
<sec>	integer	0	time in seconds to postpone the alarm.
Values:			
.....			
0		:	alarm is dismissed
1÷60		:	postpone time
.....			



Entering AT+CAPS= returns OK but has no effect.



AT+CAPD=?

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



## 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
Not required	Specific profile	No



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 and +CALA).

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	



	<div> <div>6 : YYMMDD</div> <div>7 : YY-MM-DD</div> </div>	
	<div> <div>&lt;auxmode&gt; integer 1 TE-TA interface data format.</div> <div> <div>Values:</div> <div> <div>1 : yy/MM/dd</div> <div>2 : yyyy/MM/dd</div> </div> </div> </div>	
	<div> <div> <div> <div></div> <div>The &lt;time&gt; format of +CCLK and +CALA is:</div> <div>"yy/MM/dd,hh:mm:ss+zz" when &lt;auxmode&gt;=1</div> <div>"yyyy/MM/dd,hh:mm:ss+zz" when &lt;auxmode&gt;=2</div> </div> <div> <div></div> <div>If the parameters are omitted (AT+CSDF=), then this command sets the default value of &lt;mode&gt;.</div> </div> </div> </div>	
	<div> <div>AT+CSDF?</div> <div>Read command reports the currently selected &lt;mode&gt; and &lt;auxmode&gt; in the format:</div> <div>+CSDF: &lt;mode&gt;,&lt;auxmode&gt;</div> </div>	
	<div> <div>AT+CSDF=?</div> <div>Test command reports the supported range of values for parameters &lt;mode&gt; and &lt;auxmode&gt;.</div> </div>	



&lt;/&gt;

- 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



## AT+CTZR - Time Zone Reporting

This command enables and disables the time zone change event reporting.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



**AT+CTZR=<onoff>**

Set command permits to enable/disable the time zone change event reporting.

If the reporting is enabled and whenever the time zone is changed, the MT returns the unsolicited result code:

**+CTZV: <tz>**

Parameter:

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

Unsolicited field:

Name	Type	Description
<tz>	string	New time zone.





**AT+CTZR?**

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

+CTZR: <onoff>

**AT+CTZR=?**

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



## 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
Required	Specific profile	No



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>



**AT+CTZU=?**

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



## AT#NITZ - Network Identity and Time Zone

This command handles Network Identity and Time Zone.

SIM Presence	Setting saved	Can be aborted
Required	Other	No



**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	<p>identifies the functionalities to enable. The &lt;val&gt; parameter is a sum of integer values, where every value corresponds to a functionality:</p> <ul style="list-style-type: none"> <li>1 - enables automatic date/time updating</li> <li>2 - enables Full Network Name applying</li> <li>4 - sets the #NITZ URC 'extended' format (see &lt;datetime&gt; below)</li> <li>8 - sets the #NITZ URC 'extended' format with Daylight Saving Time (DST) support (see &lt;datetime&gt; below)</li> </ul>
<p>Values:</p> <hr/> <p>0 : disables every functionality</p> <p>1÷15 : sum of integer values</p> <hr/>			



<mode>	integer	0	enables/disables the #NITZ URC
--------	---------	---	--------------------------------

Values:

0 : disables the URC

1 : enables the URC

Unsolicited field:

Name	Type	Description
------	------	-------------

<datetime>	string	string format depends on parameter <val>
------------	--------	--

"yy/MM/dd,hh:mm:ss" - 'basic' format, if <val> is in (0..3)

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

"yy/MM/dd,hh:mm:ss±zz,d" - 'extended' format with DST support, if <val> is in (8..15)

For the meaning of the <datetime> subfields, please check +CCLK and #CCLK commands

✦ If the DST information is not sent by the network, then the <datetime> parameter will have the format "yy/MM/dd,hh:mm:ss±zz".

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



AT#NITZ?

Read command reports whether  
- 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>.



The command parameters are stored in two different profiles:

<val> must be valid for all AT instances, so its value is entered in Common profile (extended section).

<mode> must be valid only for the AT instance where it has been set, so its value is entered in Specific profile (extended section).

Use the #W[<n>] command to store the updated profiles in NVM.



## AT#CCLK - Clock Management

The command is related to real time clock management.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#CCLK=<time>

Set command sets the real-time clock of the module.

Parameter:

Name	Type	Default	Description
<time>	string	N/A	Current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz,d"
<p>Values:</p> <hr/> <p>yy : year (two last digits are mandatory), range is 00..99</p> <p>MM : month (two digits are mandatory), range is 01..12</p> <p>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.</p> <p>hh : hour (two digits are mandatory), range is 00..23</p> <p>mm : minute (two digits are mandatory), range is 00..59</p> <p>ss : seconds (two digits are mandatory), range is 00..59</p>			



±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

d : number of hours added to the local TZ because of Daylight Saving Time (summertime) adjustment; range is 0-2.



Warning: any real-time clock settings will be lost if the set command is sent between a power on and a reboot/shutdown command (for example: AT#REBOOT, AT#FASTSHDN, AT#SHDN) and if the reboot occurs within 60 seconds from the power on.



#### AT#CCLK?

Read command returns the current setting of the real-time clock, in the format <time>.

If the time is set by the network but the DST information is missing, or the time is set by +CCLK command, then the <time> format is:

"yy/MM/dd,hh:mm:ss±zz"



If the time is set by the network but the Daylight-Saving Time (DST) information is missing, or the time is set by +CCLK command, then the <time> format is:

"yy/MM/dd,hh:mm:ss±zz"



#### AT#CCLK=?

Test command returns the OK result code.







Set command:

```
AT#CCLK="02/09/07,22:30:00+04,1"
```

OK

Read command:

```
AT#CCLK?
```

```
#CCLK: "02/09/07,22:30:25+04,1"
```

OK



## AT#CCLKMODE - Clock Mode

This command allows to enable the local time or the UTC time.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#CCLKMODE=<mode>**

Set command enables the local time or the UTC time in +CCLK and #CCLK commands and in #NITZ URC

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Time and date mode
Values:			
<div> <div>0</div> <div>:</div> <div>Local time + local time zone offset</div> </div>			
<div> <div>1</div> <div>:</div> <div>UTC time + local time zone offset</div> </div>			



**AT#CCLKMODE?**

Read command reports whether the local time or the UTC time is enabled, in the format:

#CCLKMODE: <mode>



**AT#CCLKMODE=?**

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



Example of the two clock mode settings:

```
AT#CCLKMODE?
```

```
#CCLKMODE: 0
```

```
OK
```

```
#NITZ: 13/03/05,15:20:33+04,0
```



```
AT+CCLK?  
+CCLK: "13/03/05,15:20:37+04"  
OK  
  
AT#CCLKMODE=1  
OK  
  
AT+CCLK?  
+CCLK: "13/03/05,14:20:45+04"  
OK  
  
AT#CCLKMODE?  
#CCLKMODE: 1  
OK  
  
#NITZ: 13/03/05,14:20:53+04,0  
  
AT+CCLK?  
+CCLK: "13/03/05,14:20:55+04"  
OK  
  
AT#CCLKMODE=0  
OK  
  
AT+CCLK?  
+CCLK: "13/03/05,15:20:59+04"  
OK
```



## AT#WAKE - Wake from Alarm Mode

Stop any alarm activity

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#WAKE=<opmode>

Execution command stops any eventually present alarm activity and, if the module is in alarm mode, it exits the alarm mode and enters the normal operating mode.

Parameter:

Name	Type	Default	Description
<opmode>	integer	0	operating mode
Value: <div>             0 : normal operating mode; the module exits the alarm mode and enters the normal operating mode, any alarm activity is stopped (e.g. alarm tone playing) and an OK result code is returned.           </div>			



If #WAKE=0 command is issued after an alarm has been set with +CALA command, but before the alarm has expired, it will answer OK but have no effect.



AT#WAKE?

Read command returns the operating status of the device in the format:

#WAKE: <status>

where:

<status>

0 - normal operating mode

1 - alarm mode or normal operating mode with some alarm activity.





AT#WAKE=?

Test command returns OK result code.





-  The alarm mode is indicated by status ON of hardware pin CTS and by status ON of pin DSR; the power saving status is indicated by a CTS - OFF and DSR - OFF status; the normal operating status is indicated by DSR - ON.
-  During the alarm mode the device will not make any network scan and will not register to any network and therefore is not able to dial or receive any call or SM, the only commands that can be issued to the MODULE in this state are the #WAKE and #SHDN, every other command must not be issued during this state.



## AT+CSTF - Setting Time Format

Set command sets the time format of the time information presented to the user, which is specified by use of the <mode> parameter.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT+CSTF=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	1	<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
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=?**

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



# AT+CALD - Delete Alarm

This command deletes an alarm in the ME.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CALD=<n>

Parameter:

Name	Type	Default	Description
<n>	integer	A	alarm index
Value:			
.....			
0 : alarm index			
.....			



AT+CALD=?

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





# Audio



## Audio Basic Configuration



## AT+CRSL - Ringer Sound Level

This command is used to select the incoming call ringer sound level of the device.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No



AT+CRSL=<level>

Set command is used to select the incoming call ringer sound level of the device.

Parameter:

Name	Type	Default	Description
<level>	integer	2	Incoming call ringer sound level.
Values:			
0	:	Level: Off	
1	:	Level: Low	
2	:	Level: Middle	
3	:	Level: High	
4	:	Level: Progressive	



AT+CRSL?

Read command reports the current <level> setting of the call ringer in the format:



+CRSL: <level>



AT+CRSL=?

Test command reports <level> supported values as compound value.

+CRSL: (0-4)



#### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



# AT+CLVL - Loudspeaker Volume Level

This command allows to set the volume of internal loudspeaker audio output.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No



AT+CLVL=<level>

Set command is used to select the volume of the internal loudspeaker audio output of the device.

Parameter:

Name	Type	Default	Description
<level>	integer	4	Loudspeaker volume.
<p>Value:</p> <p>.....</p> <p>0÷max : max value can be read by issuing the Test command.</p> <p>.....</p>			



AT+CLVL?

Read command reports the current <level> setting of the loudspeaker volume in the format:

+CLVL: <level>



AT+CLVL=?

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





Modules supporting the command	
ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



The setting is saved using the &W command.



# AT+CMUT - Microphone Mute Control

This command enables/disables the muting of the uplink audio line during a voice call.



- 3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CMUT=<n>

Parameter:

Name	Type	Default	Description
<n>	integer	0	controls the muting of the uplink audio line
Values:			
0	:	mute off, microphone active	
1	:	mute on, microphone muted	



Set command is operative only during a voice call and it returns ERROR in all other cases.





## AT+CMUT?

Read command reports whether the muting of the uplink audio line during a voice call is enabled or not, in the format:

+CMUT:<n>



## AT+CMUT=?

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



### Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice





## AT#ACDB - Audio Configuration

Injection of Audio Configuration.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#ACDB[=<mode>]**

This execution command starts injection of Audio configuration (ACDB) into the device. Once command is issued, the device will print the "connect" reply and will wait for data to be received.

+++ sequence can be used for end of data transmission (which will result in OK response).

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Inject mode
<p>Value:</p> <p>0 : Cold mode Injection. Audio Configuration is injected into FLASH. In order to be effective a reboot is required</p>			



**AT#ACDB=?**

Test command returns OK result code



Modules supporting the command



ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## AT#OAP - Open Audio Loop

This set command enables/disables the Open Audio Path.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#OAP=[<mode>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the Open Audio Path
Values:			
.....			
0		:	disable
1		:	enable
.....			



AT#OAP?

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

#OAP: <mode>



AT#OAP=?

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



Modules supporting the command



ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



#OAP is intended for testing purposes only. Thus, care must be taken to ensure that during the command execution no other audio interacting commands are issued.



# Audio Profiles



## AT#PSEL - Audio Profile Selection

This command manages the audio profile selection.

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No



**AT#PSEL=<prof>**

Set command selects the active audio profile.

Parameter:

Name	Type	Default	Description
<prof>	integer	0	current profile
Values:			
.....			
0	:	default profile	
1÷3	:	extended profiles	
.....			



**AT#PSEL?**

Read command returns the active profile in the format:

#PSEL:<prof>



**AT#PSEL=?**

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



Modules supporting the command	
ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



The setting is saved using the &W command.



## Embedded DTMF Decoder & TTY





## AT#DTMF - Embedded DTMF Decoder Enabling

This command enables/disables the embedded DTMF decoder.

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No



**AT#DTMF=<mode>**

Set command enables/disables the embedded DTMF decoder.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the embedded DTMF decoder
<p>Values:</p> <p>.....</p> <p>0 : disables DTMF decoder</p> <p>1 : enables the embedded DTMF decoder with URC activation</p> <p>2 : enables the embedded DTMF decoder without URC activation</p> <p>.....</p>			

Additional info:

▶▶ <mode>=1

The DTMF tone receiving is notified with an unsolicited message through AT interface in the following format:

#DTMFEV: x



Unsolicited field:

Name	Type	Description
<X>	string	DTMF digit



AT#DTMF?

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

#DTMF: <mode>



AT#DTMF=?

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



Modules supporting the command

ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



## Digital Voice Interface



## AT#DVI - Digital Voiceband Interface

Digital Voiceband Interface handling.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#DVI=<mode>[,<dviport>,<clockmode>]

Set command enables/disables the Digital Voiceband Interface. To have information about the pins used by the interface, refer to document [1].

Parameters:

Name	Type	Default	Description
<mode>	integer	1	enables/disables the DVI
Values: <div> <div>0 : disable DVI</div> <div>1 : enable DVI: audio is forwarded to the DVI block</div> <div>2 : enable DVI: audio is forwarded to the DVI block. All remaining command parameters (also including AT#DVIEXT parameters) are ignored</div> </div>			
<dviport>	integer	2	select DVI port
Value:			



2 : DVI port, the only available.

<clockmode> integer 1 select DVI clock mode.

Values:

0 : DVI slave

1 : DVI master



<clock> parameter 0 DVI SLAVE is valid only in I2S mode, please refer to AT#DVIEXT settings



AT#DVI?

Read command reports last setting, in the format:

#DVI: <mode>,<dviport>,<clockmode>



AT#DVI=?

Test command reports the range of supported values for parameters <mode>,<dviport> and <clockmode>.



Modules supporting the command

ME310G1-

WWV



ME910G1-	WWV
ML865G1-	WW voice



All audio features, including DTMF detection are dependent on DVI status.  
Before carrying out any audio operations, please check if DVI is enabled.



Configure DVI as master using the DVI Port #2 (the only available)  
AT#DVI=1,2,1  
OK



# AT#DVIEXT - Digital Voiceband Interface Extension

Digital Voiceband Interface Extension.

SIM Presence	Setting saved	Can be aborted
Not required	Common profile	No





AT#DVIEXT=<config>[,<samplerate>[,<samplewidth>[,<audiomode>[,<edge>]]]]

Set command configures the Digital Voiceband Interface.

Parameters:

Name	Type	Default	Description
<config>	integer	1	Transmission mode
Values: ..... 0      : Burst Mode (PCM) 1      : Normal Mode (I2S) .....			
<samplerate>	integer	0	Sample rate
Values: ..... 0      : audio scheduler sample rate 8KHz 1      : NOT SUPPORTED .....			
<samplewidth>	integer	0	Number of bit per sample
Values:			



	<div> <div>0 : 16 bits per sample</div> <div>1 : NOT SUPPORTED</div> <div>2 : NOT SUPPORTED</div> <div>3 : NOT SUPPORTED</div> <div>4 : NOT SUPPORTED</div> </div>	
	<div> <div>&lt;audiomode&gt; integer 1 Mode of audio</div> <div> <div>Values:</div> <div> <div>0 : Mono Mode</div> <div>1 : Dual Mono</div> </div> </div> </div>	
	<div> <div>&lt;edge&gt; integer 0 Edge on which bit is transmitted</div> <div> <div>Values:</div> <div> <div>0 : NOT SUPPORTED</div> <div>1 : NOT SUPPORTED</div> </div> </div> </div>	
	<div> <div>AT#DVIEXT?</div> <div>Read command reports last setting, in the format:</div> <div>#DVIEXT: &lt;config&gt;,&lt;samplerate&gt;,&lt;samplewidth&gt;,&lt;audiomode&gt;,&lt;edge&gt;</div> </div>	
	<div> <div>AT#DVIEXT=?</div> </div>	





Test command reports the range of supported values for parameters:  
<config>,<samplerate>,<samplewidth>,<audiomode>,<edge>



Modules supporting the command	
ME310G1-	WWV
ME910G1-	WWV
ML865G1-	WW voice



Configure DVI as PCM, dual mono using  
AT#DVIEXT=1,0,0,1,0  
OK



## HW and Radio Control



## AT#CBC - Battery and Charger Status

This command returns the current Battery and Charger state.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT#CBC

Execution command returns the current Battery and Charger state. The response is in the format:

#CBC: <ChargerState>,<BatteryVoltage>

Additional info:

►► The response has its fields described below.

Name	Type	Default	Description
<ChargerState>	integer	0	Battery charger state
Values: <div>             0 : charger not connected             1 : charger connected and charging             2 : charger connected and charge completed           </div>			
<BatteryVoltage>	integer	-	battery voltage in units of 10 mV: it is the real battery voltage only if charger is not connected; if the charger is connected this value depends on the charger voltage





AT#CBC=?

Test command returns the OK result code.



## AT#TEMPCFG - Temperature Monitor Configuration

Set command sets the temperature zones shown in Note section. Use #TEMPMON command to get the current internal temperature of the module.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#TEMPCFG=<etlz\_clr>,<etlz>,<etlz\_act\_in>,<otlz\_clr>,<otlz>,<otlz\_act\_in>,<otnz\_clr>,<otnz>,<otnz\_act\_in>,<otuz\_clr>,<otuz>,<otuz\_act\_in>,<etuz\_clr>,<etuz>,<etuz\_act\_in>

Parameters:

Name	Type	Default	Description
<etlz_clr>	integer	-	extreme low zone temperature threshold clear. It has only one valid value: -273 °C. See note.
<etlz>	integer	-	extreme low zone temperature threshold. Default value -33 °C.
<etlz_act_in>	integer	-	extreme low zone action info. Default value 0.
<otlz_clr>	integer	-	operate low zone temperature threshold clear. Default value -35 °C.
<otlz>	integer	-	operate low zone temperature threshold. Default value -28 °C.
<otlz_act_in>	integer	-	operate low zone action info. Default value 0.
<otnz_clr>	integer	-	operate normal zone temperature threshold clear. Default value -30 °C.
<otnz>	integer	-	operate normal zone temperature threshold. Default value 95 °C.



<otnz_act_in>	integer	-	operate normal zone action info. Default value 0.
<otuz_clr>	integer	-	operate up zone temperature threshold clear. Default value 93 °C.
<otuz>	integer	-	operate up zone temperature threshold. Default value 100 °C.
<otuz_act_in>	integer	-	operate up zone action info. Default value 3.
<etuz_clr>	integer	-	extreme up zone temperature threshold clear. Default value 98 °C.
<etuz>	integer	-	extreme up zone temperature threshold. It has only one valid value: 528 °C. See note.
<etuz_act_in>	integer	-	extreme up zone action info. Default value 3.

- ✦ The temperature correctly set are saved in a configuration file in the module file system.
- ✦ etlz\_clr: extreme low zone threshold clear is enforced to have value of -273 °C. Module doesn't operate in such temperature, but this value is logically set to define clearly 'thermal state' to temperatures below -40 °C.
- ✦ etuz: extreme up zone threshold is enforced to have value of 528 °C. Module doesn't operate in such temperature, but this value is logically set to define clearly 'thermal state' to temperatures above 100 °C.
- ✦ The user must not set <otnz\_act\_in>=5 (Operate normal zone). This comes to prevent setting "automatic shutdown" by mistake to the normal operating temperature range. Error will be received as a response:  
  
+CME ERROR: operation not supported
- ✦ Thermal mitigation is disabled automatically when using a laboratory test SIM.



A SIM is a test SIM if it has an MCC of 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012 .



#### AT#TEMPCFG?

Read command reports the current parameter setting for #TEMPCFG command in the format:

#TEMPCFG:<etlz\_clr>,<etlz>,<etlz\_act\_in>,<otlz\_clr>,<otlz>,<otlz\_act\_in>,<otnz\_clr>,<otnz>,<otnz\_act\_in>,<otuz\_clr>,<otuz>,<otuz\_act\_in>,<etuz\_clr>,<etuz>,<etuz\_act\_in>



#### AT#TEMPCFG=?

Test command reports the supported range values for parameters <x\_clr>,<x>,<x\_act\_in>, where "x" is substitute for etlz, otlz, otnz, otuz, etuz.

Values are:

#TEMPCFG: (-40-100),(-40-100),(0-5)



#### Thermal mitigation mechanism

After setting new values, the mitigation algorithm operates with them if a power cycle or a #REBOOT command is executed. Thermal mitigation mechanism works like this:

the whole temperature scale is divided into 5 states (zones).

each measured temperature should belong to a state called the current state.

Each state is defined by the following fields:

threshold	upper temperature boundary of the state. Values are in Celsius degrees.
threshold_clr	lower temperature boundary of the state. Values are in Celsius degrees.



`action_in` indicator that indicates if an action should be taken or not in the current state.

`action_in` can be none or mitigate, their values are shown in the table below.

none	mitigate	mitigation action
0		no mitigation
	1	data throttling (reducing uplink baud rate)
	2	TX back off (reducing MTPL - Max Tx Power Limit)
	3	emergency calls only
	4	RF OFF. RX and TX circuits automatically disabled (using +CFUN=4)
	5	automatic shutdown. Module is powered OFF

When temperature exceeds the current state threshold, the thermal mitigation algorithm searches the next state when this temperature is lower than threshold. After it finds it, the current state is updated to that state and then it checks whether action is mitigate. If yes, then it activates the mitigation according to the `action_in` of the current state.

When temperature decreases below `threshold_clr` then it does the same algorithm as above, but in the opposite direction. It searches the next state when this temperature is greater than `threshold_clr`, updates the current state to that state, and activates mitigation as described above.

In the state definitions there are the following two rules:

rule 1: overlap between 2 adjacent states of at least 2 °C, i.e.:

$\text{thr of state}(x) - \text{thr\_clr of state}(x+1) \geq 2$

rule 2: every state shall have free temperature range which has no part in any overlap range. This range should be at least 2 °C, i.e.:

$\text{thre\_clr state}(x+2) - \text{thre state}(x) \geq 2$





Rule 1 comes to ensure hysteresis in the transition between two states.

Rule 2 comes to ensure a minimum range for a stable state.



Referring to the figure below:

State 0 is Extreme low zone

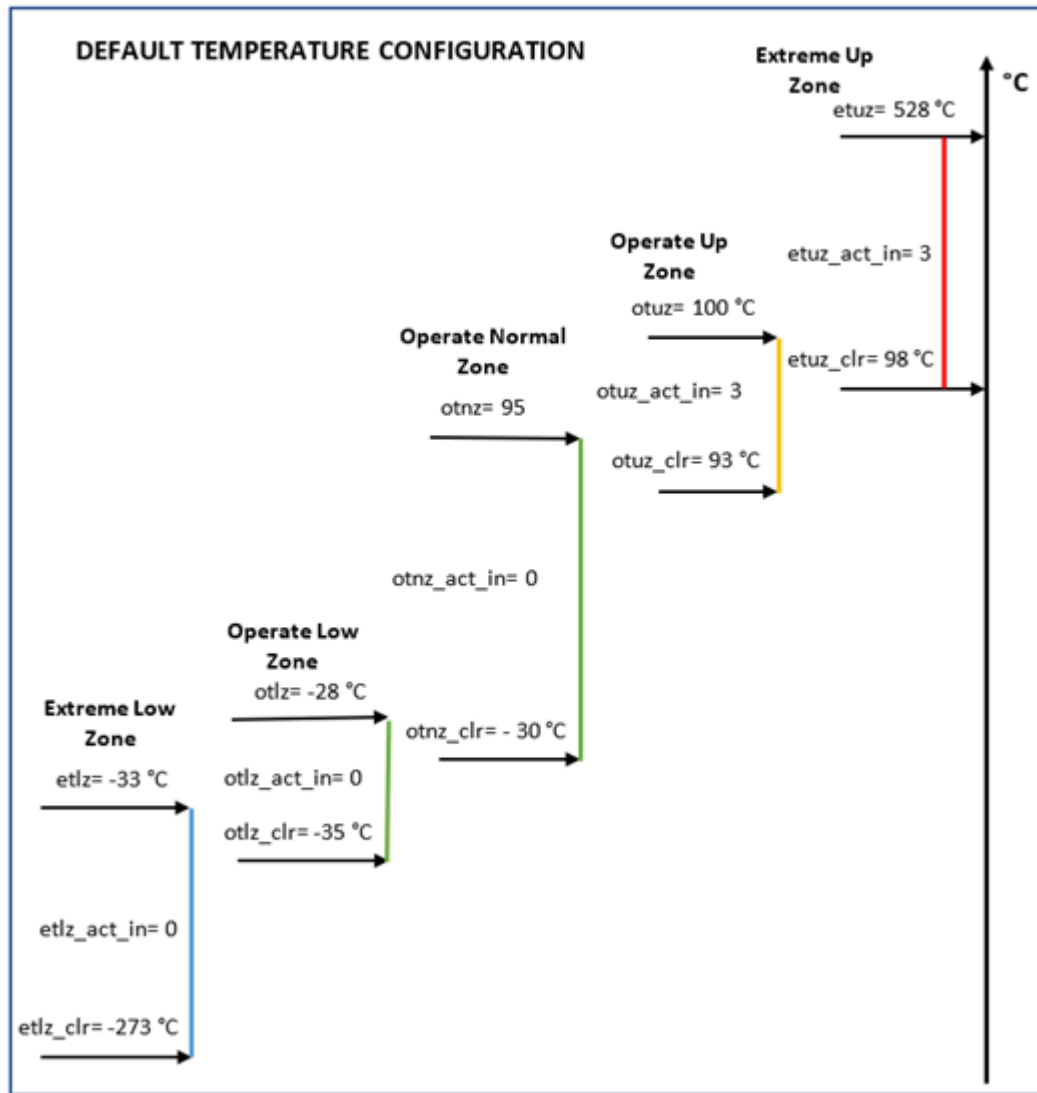
State 1 is Operate low zone

State 2 is Operate normal zone

State 3 is Operate up zone

State 4 is Extreme up zone





</>

- AT#TEMPCFG= -273,-33,3,-35,-28,2,-30,80,0,78,90,3,88,528,3  
OK

Rules 1 and 2 are respected.

zone	thr_clr	thr	action_in
------	---------	-----	-----------



Extreme low zone	-273	-33	3: emergency call only
Operate low zone	-35	-28	2: TX back off
Operate normal zone	-30	80	0: no mitigation
Operate up zone	78	90	3: emergency call only
Extreme up zone	88	528	3: emergency call only

- AT#TEMPCFG=-273,-33,3,-35,-28,2,-30,80,0,79,90,3,88,528,3  
+CME ERROR: operation not supported

Rule 1 is not respected:

(thr of Operate normal zone) - (thr\_clr of Operate up zone) = 1 < 2

zone	thr_clr	thr	action_in
Extreme low zone	-273	-33	3: emergency call only
Operate low zone	-35	-28	2: TX back off
Operate normal zone	-30	80	0: no mitigation
Operate up zone	79	90	3: emergency call only
Extreme up zone	88	528	3: emergency call only

- AT#TEMPCFG=-273,-33,3,-35,-28,2,-30,80,0,78,90,3,81,528,3  
+CME ERROR: operation not supported



Rule 2 is not respected:

$(\text{thr\_clr of Extreme up zone}) - (\text{thr of Operate normal zone}) = 1 < 2$

zone	thr_clr	thr	action_in
Extreme low zone	-273	-33	3: emergency call only
Operate low zone	-35	-28	2: TX back off
Operate normal zone	-30	80	0: no mitigation
Operate up zone	78	90	3: emergency call only
Extreme up zone	81	528	3: emergency call only



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

Configure the general-purpose input/output GPIO pins.

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



AT#GPIO=[<pin>,<mode>[,<dir>[,<save>]]]

Execution command allows to configure the general purpose GPIO pin.

Parameters:

Name	Type	Default	Description
<pin>	integer	N/A	GPIO pin number. The supported range goes from 1 to Max value that is hardware dependent. Use AT#GPIO=? test command to know Max value.
Value: ..... 1÷Max : GPIO pin identifier .....			
<mode>	integer	0	sets GPIO pin configuration, its action depends on <dir> value. Refer to Additional info sections.
Value: ..... 0÷4 : mode identifier .....			
<dir>	integer	0	sets the GPIO pin in input, output, or alternate functions. Refer to Additional info sections.
Values:			



0	:	pin set as input
1	:	pin set as output
2÷16	:	pin set in alternate functions.
<save>	integer 0	GPIO pin save configuration. If <save> is omitted, the configuration is stored in NVM only if user set ALTx function.
Values:		
0	:	GPIO pin configuration is not saved
1	:	GPIO pin configuration is saved

Additional info:

►► This table shows the GPIOs configurations set by <dir>=0 and <mode> values ranging from 0 to 4.

AT#GPIO=<pin>,<mode>,0

<mode>	Description
0	Set INPUT, any internal pull up/pull down removed.
1	Set INPUT, any internal pull up/pull down removed (same behavior as <mode>=0).
2	Read mode, <dir> can be omitted, see Additional info section below



3	Set INPUT, and internal pull up.
4	Set INPUT, and internal pull down.

- This table shows the GPIOs configurations set by <dir>=1 and <mode> values ranging from 0 to 4.

AT#GPIO=<pin>,<mode>,1

<mode>	Description
0	Set OUTPUT, and GPIO logical value to zero (Low).
1	Set OUTPUT, and GPIO logical value to one (High).
2	Read mode, <dir> can be omitted, see Additional info section below
3	<mode> has no meaning.
4	<mode> has no meaning.

- <mode>=2 selects the read mode. In read mode, <dir> can be omitted.

AT#GPIO=<pin>,2

Name	Type	Default	Description
<stat>	integer	-	the parameter can be:



logic value read from pin GPIO<pin> in the case the pin <dir> is set to input.

logic value present in output of the pin GPIO<pin> in the case the pin <dir> is currently set to output.

no meaning value for the pin GPIO<pin> in the case the pin <dir> is set to alternate function or tristate pull down.

- <dir> values from 2 to 16 select an alternate function ranging respectively from ALT1 to ALT15. <mode> must be set to 0 or 1 when an alternate function is selected. The table shows the relationship between ALTx, <dir> and the name of the associated function.

AT#GPIO=<pin>,0,<dir>

ALTx	Functions names (between quotes) associated to ALTx
ALT1 (<dir>=2)	#GPIO maps "STAT_LED" on: GPIO_01 for ME910G1 family: AT#GPIO=1,0,2 GPIO_08 for ML865G1 family: AT#GPIO=8,0,2 see #SLED to configure the STAT_LED GPIO_x behavior.
ALT2 (<dir>=3)	#GPIO or #ALARMPIN maps "ALARM" on one of the available GPIOs. Example: AT#GPIO=<pin>,0,3
ALT3 (<dir>=4)	#GPIO maps "TEMPMON" on one of the available GPIOs. Example: AT#GPIO=<pin>,0,4
ALT4 (<dir>=5)	Reserved
ALT5 (<dir>=6)	Reserved





ALT6 (<dir>=7)	#GPIO maps "FASTSHDN" on one of the available GPIOs. Example: AT#GPIO=4,0,7
ALT7 (<dir>=8)	Reserved
ALT8 (<dir>=9)	#GPIO maps "DTR" on GPIO_01 or GPIO_05 for ME310G1 family
ALT9 (<dir>=10)	#GPIO maps "RING" on GPIO_02 for ME310G1 family
ALT10 (<dir>=11)	#GPIO maps "SIMIN" on one of the available GPIOs for ME310G1 and ML865G1 families. The same function can be set through #SIMINCFG command. Example: AT#GPIO=5,0,11
ALT11 (<dir>=12)	Dying Gasp feature: This feature can be set only by #DGEN. #GPIO can only read if a pin is connected to this feature
ALT12 (<dir>=13)	#GPIO maps "Network Attach Indicator" on GPIO_03 for ME310G1 SKT
ALT13 (<dir>=14)	#GPIO maps "TX Packet Monitor" on GPIO_04 for ME310G1 SKT
ALT14 (<dir>=15)	#GPIO maps "RX Packet Monitor" on GPIO_05 for ME310G1 SKT
ALT15 (<dir>=16)	#GPIO maps "DCD" on one of the available GPIOs for ME310G1 family



ALT12: TGPIO\_03 goes low when there is a CS or a PS attach, even in ROAMING, otherwise it is high.



- ✦ ALT14: GPIO\_04 goes low as soon as a TX packet (PPP, ECM) is sent, and then it starts toggling high and low with 100 ms time as long as TX packets are sent. When there are no more packets to sent the pin goes back to high state.
- ✦ ALT15: GPIO\_05 goes low as soon as a RX packet (PPP, ECM) is received, and then it starts toggling high and low with 100 ms time as long as RX packets are received. When there are no more packets to receive the pin goes back to high state.
- ✦ 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, for any GPIO pin, a row showing the current parameters values. Row one shows GPIO pin one, row two shows GPIO pin two, and so on.

```
#GPIO: <dir>,<stat><CR><LF>
```

```
#GPIO: <dir>,<stat><CR><LF>
```

...

If GPIO was previously set to <mode>= 3 or 4, the format of the returned message is:

```
#GPIO:<dir>,<stat>,<mode><CR><LF>
```

```
#GPIO:<dir>,<stat>,<mode><CR><LF>
```

...



### AT#GPIO=?

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



Check the available values ranges

```
AT#GPIO=?
```

```
#GPIO: (1-6),(0-4),(0-16),(0,1)
```

```
OK
```

Set GPIO\_3 in output, and set logical value HIGH

```
AT#GPIO=3,1,1
```

```
OK
```



Set GPIO\_4 as output, value HIGH a save setting  
AT#GPIO=4,1,1,1  
#GPIO: 1,0  
OK

Report GPIO\_3 state  
AT#GPIO=3,2  
#GPIO: 1,1  
OK

Read command  
AT#GPIO?  
#GPIO: 1,1      GPIO\_1 is output, value is HIGH  
#GPIO: 0,0  
#GPIO: 1,1  
#GPIO: 0,0  
#GPIO: 0,1      GPIO\_5 is input, value is HIGH  
#GPIO: 1,0  
OK



# AT#PINCFG - Add extra GPIOs

This command reconfigures a specific peripheral pin as a GPIO.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No

AT#PINCFG=<action>[,<pin name>[,<gpio number>]]

Set command configures a pin identified with <pin name> as an extra GPIO enumerated by <gpio number>. Reset pin configuration will delete all extra GPIO entries.

Parameters:

Name	Type	Default	Description
<action>	integer	-	the <action> parameter can be used as shown in Values section
Values: <div> <div>0</div> <div>:</div> <div>reset pin configuration</div> </div> <div> <div>1</div> <div>:</div> <div>configure pin as extra GPIO</div> </div>			
<pin name>	string	-	allowed pin names are reported by AT#PINCFG=? test command
<gpio number>	integer	-	GPIO pin number
Values: <div> <div>7÷10</div> <div>:</div> <div>GPIO pin number</div> </div>			

Additional info:



- Once an extra GPIO is configured, it can be managed with AT#GPIO. Extra GPIO can be input or output, alternate functions are not supported.

Each new extra GPIO has to be added with a sequential <gpio number>.



If a pin is configured as an extra GPIO, avoid using any command related to its original functionality. Doing so will prevent unintended behaviors

#### AT#PINCFG?

Read command lists the configured extra GPIOs.

The order follows the <pin name> list returned by test command AT#PINCFG=?

#PINCFG: <pin name>,<gpio number>

#PINCFG: <pin name>,<gpio number>

...

#### AT#PINCFG=?

Test command returns the list of supported values for <action>, <pin name> and <gpio number>.



#### Modules supporting the command

ME310G1-	WW
ME310G1-	WWV
ME310G1-	W1
ME310G1-	W2
ME310G1-	W3





Check the available value range

```
AT#PINCFG=?
```

```
#PINCFG: (0-1),("STAT_LED","DAC_OUT","SPI_CS",  
"SPI_MISO","SPI_MOSI","SPI_CLK"),(7-10)
```

```
OK
```

Set extra GPIOs

```
AT#PINCFG=1,"DAC_OUT",7
```

```
OK
```

```
AT#PINCFG=1,"STAT_LED",8
```

```
OK
```

```
AT#PINCFG=1,"SPI_CLK",9
```

```
OK
```

Check parameters value

```
AT#PINCFG?
```

```
#PINCFG: STAT_LED, 8
```

```
#PINCFG: DAC_OUT, 7
```

```
#PINCFG: SPI_CLK, 9
```

```
OK
```

List new extra GPIOs using AT#GPIO

```
AT#GPIO?
```

```
#GPIO: 0,0,4
```

```
#GPIO: 0,0,4
```

```
#GPIO: 0,0,4
```

```
#GPIO: 0,0,4
```

```
#GPIO: 0,0,4
```

```
#GPIO: 0,0,4
```

```
#GPIO: 0,0,4 ..... GPIO_7 is routed on DAC_OUT pin
```

```
#GPIO: 0,0,4 ..... GPIO_8 is routed on STAT_LED pin
```

```
#GPIO: 0,0,4 ..... GPIO_9 is routed on SPI_CLK pin
```

```
OK
```



Reset and check pin configuration

AT#PINCFG=0

OK

AT#PINCFG?

OK



## AT#ALARMPIN - Alarm Pin Configuration

This command allows to configure the ALARM Pin.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#ALARMPIN=<pin>

Set command allows to set a GPIO pin as ALARM pin.

Configuring a GPIO pin as ALARM pin is equivalent to setting it up with the ALT2 alternate function. Therefore, a GPIO pin can be configured as ALARM pin also through the #GPIO command. To have information on GPIO pins refer to document [1].

Parameter:

Name	Type	Default	Description
<pin>	integer	0	GPIO pin number. Max is the number of GPIO pins provided by the module. For information on the available GPIO pins use the test command.
Values:			
.....			
0		:	no ALARM pin set
1÷Max		:	GPIO pin number
.....			



AT#ALARMPIN?





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

#ALARMPIN: <pin>



AT#ALARMPIN=?

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



## AT#SLED - STAT\_LED GPIO Setting

The command configures the behavior of the STAT\_LED status.

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



AT#SLED=<mode>[,<onDuration>[,<offDuration>]]

STAT\_LED is mapped on a GPIO for ME910G1 and ML865G1 families, but it is on a dedicated pin for ME310G1 family.

To configure a GPIO pin as STAT\_LED GPIO, the user must enter AT#GPIO=x,0,2 command to set the GPIO\_x pin as ALT1 alternate function. At the next power ON, the GPIO pin is low until the control reads the saved setting in NVM and configures the GPIO\_x as STAT\_LED GPIO. Not all GPIOs can be configured as STAT\_LED pin. See #GPIO description to know the available GPIOs for this function.

In case of a dedicated pin for STAT\_LED function, there is no GPIO to set in ALT1 function.

Parameters:

Name	Type	Default	Description								
<mode>	integer	A	defines the STAT_LED pin behavior. "pin" indicates the GPIO or the dedicated pin according to the family of modules used.								
<table><tr><th>Family</th><th>&lt;mode&gt; default value</th></tr><tr><td>ME910G1</td><td>2</td></tr><tr><td>ML865G1</td><td>2</td></tr><tr><td>ME310G1</td><td>5</td></tr></table>				Family	<mode> default value	ME910G1	2	ML865G1	2	ME310G1	5
Family	<mode> default value										
ME910G1	2										
ML865G1	2										
ME310G1	5										
Values:											
0 : pin tied low											



1 : pin tied high  2 : pin is handled with specific timings. See Additional info section  3 : pin is turned ON/OFF alternatively, with period defined by the sum <onDuration> + <offDuration>  4 : pin is handled with specific timings. See Additional info section  5 : status led disabled  .....			
<onDuration>	integer	10	duration of period in which STAT_LED pin is tied high while <mode>=3
Value:  ..... 1÷100 : in tenth of seconds .....			
<offDuration>	integer	10	duration of period in which STAT_LED pin is tied low while <mode>=3
Value:  ..... 1÷100 : in tenth of seconds .....			

#### Additional info:

- <mode>=2, the timings of STAT\_LED pin are:  
not registered: always ON  
registered in idle: blinking 1 s ON and 2 s OFF  
registered in idle with power saving: blinking time depends on network condition to minimize power consumption



during a voice call: always ON

- ▶▶ <mode>=4, the timings of STAT\_LED pin are:
  - not registered: blinking 0,5 s ON and 0,5 s OFF
  - registered in idle: blinking 300 ms ON and 2,7 s OFF
  - registered in idle with power saving: blinking time depends on network condition to minimize power consumption
  - during a voice call: always ON



#### AT#SLED?

Read command returns the STAT\_LED pin current setting, in the format:

#SLED: <mode>,<onDuration>,<offDuration>



#### AT#SLED=?

Test command returns the range of available values for parameters <mode>, <onDuration> and <offDuration>.



The setting is saved using the #SLEDSAV command.



## AT#SLEDSAV - Save STAT\_LED GPIO Setting

This command allows to save the current STAT\_LED GPIO setting.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#SLEDSAV

Execution command saves the STAT\_LED GPIO setting in NVM.



### AT#SLEDSAV=?

Test command returns OK result code.



## AT#ADC - Read Analog/Digital Converter Input

This command returns the current voltage value of the specified ADC inputs, expressed in mV.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#ADC=[<adc>,<mode>[,<dir>]]

Execution command reads selected <adc> pin voltage, converts it by baseband internal ADC and prints outs the result as shown in Additional info section.

Parameters:

Name	Type	Default	Description
<adc>	integer	1	index of input pin
Value:			
.....			
1÷n : input pin index. For the number of available ADCs see document [1]			
.....			
<mode>	integer	2	required action
Value:			
.....			
2 : query ADC value			
.....			
<dir>	integer	0	direction. Its interpretation is currently not implemented.
Value:			



```
0 : no effect
```

Additional info:

►► Format of the message printed out by the execution command:  
#ADC:<value>

Name	Type	Default	Description
<adc>	integer	-	pin voltage expressed in mV.

✚ The command returns the last valid measure.



AT#ADC?

Read command reports all pins input voltage in the format:

#ADC:<value>[<CR><LF>#ADC:<value>[...]]



AT#ADC=?

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



# AT#V24CFG - V24 Output Pins Configuration

This command sets the AT commands serial port interface output pins mode.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#V24CFG=<pin>,<mode>



Set command sets the AT commands serial port interface output pins mode.

Parameters:

Name	Type	Default	Description
<pin>	integer	0	AT commands serial port interface hardware pin
Values: <div> <div>0</div> <div>:</div> <div>DCD (Data Carrier Detect)</div> </div> <div> <div>1</div> <div>:</div> <div>CTS (Clear To Send)</div> </div> <div> <div>2</div> <div>:</div> <div>RI (Ring Indicator)</div> </div> <div> <div>3</div> <div>:</div> <div>DSR (Data Set Ready)</div> </div>			
<mode>	integer	0	AT commands serial port interface hardware pins mode
Values: <div> <div>0</div> <div>:</div> <div>AT commands serial port mode: the V24 pins are controlled by the serial port device driver</div> </div> <div> <div>1</div> <div>:</div> <div>GPIO mode: the V24 output pins can be managed through the #V24 command</div> </div>			





-  Changing V24 pins configuration may affect the cellular module functionality set through +CFUN.
-  After being set the CTS pin as output pin, its functionality as CTS can be restored only through a reboot



#### AT#V24CFG?

Read command returns the current configuration for all the pins (both output and input) in the format:

```
#V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF>
```

```
#V24CFG: <pin2>,<mode2>[...]]
```



#### AT#V24CFG=?

Test command reports supported range of values for parameters <pin>, and <mode>.



## AT#V24 - V24 Output Pins Control

This command sets the state of the output pins of the AT commands serial port interface.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#V24=<pin>[,<state>]**

Set command sets the AT commands serial port interface output pins state.

Parameters:

Name	Type	Default	Description
<pin>	integer	0	AT commands serial port interface hardware pin:
Values: <div> <div>0 : DCD (Data Carrier Detect)</div> <div>1 : CTS (Clear To Send)</div> <div>2 : RI (Ring Indicator)</div> <div>3 : DSR (Data Set Ready)</div> </div>			
<state>	integer	0	State of AT commands serial port interface output hardware pins (0, 1, 2, 3) when pins are in GPIO mode (see #V24CFG):
Values: <div> <div>0 : Low state</div> <div>1 : High state</div> </div>			





If <state> is omitted the command returns the actual state of the pin <pin>.



AT#V24?

Read command returns actual state for all the available pins in the format:

#V24: <pin1>,<state1>[<CR><LF>

#V24: <pin2>,<state2>[...]]



AT#V24=?

Test command returns the supported values of parameters <pin> and <state>.



## AT#I2CWR - Write to I2C

This command is used to send data to an I2C peripheral connected to module.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#I2CWR=<sdaPin>,<sclPin>,<deviceId>,<registerId>,<len>

Execution command sends data to an I2C peripheral connected to module GPIOs. After the writing activity has been accomplished, the GPIOs will not be restored to the original setting. Use #GPIO command to see the status of the used GPIOs. To have information on GPIO pins refer to document [1].

Parameters:

Name	Type	Default	Description
<sdaPin>	integer	-	GPIO number for SDA. To know the range use #I2CWR test command.
<sclPin>	integer	-	GPIO number for SCL. To know the range use #I2CWR test command.
<deviceId>	hex	N/A	address of the I2C device (7 bits). The Least Significant Bit is used for read/write command, but in this #I2CWR implementation, it doesn't matter if the LSB is set to 0 or 1.  Address must be written in hexadecimal form without 0x.  10 bit address is also supported.
Value:			



			0÷3FF	:	addressing range extended to 10 bit
<registerId>	hex	N/A			register to write data to
			Value:		
			0÷FF	:	value must be written in hexadecimal form without 0x
<len>	integer	N/A			number of data to send
			Value:		
			1÷254	:	number of data to send

#### Additional info:

- ▶▶ After entering the command, the module returns the prompt ">" and waits for the data to send. To complete the operation, send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex). Data must be written in hexadecimal form.

If data are successfully sent, the response is OK, otherwise an error code is reported.



#### AT#I2CWR=?

Test command returns the range of available values for parameters <sdaPin>, <sclPin>, <deviceId>, <registerId>, <len>.





Set GPIO\_2 as SDA, and GPIO\_3 as SCL. Device I2C address is 0x20; 0x10 is the address of the first register where to write I2C data; 14 data bytes will be written starting from register 0x10.

```
AT#I2CWR=2,3,20,10,14  
> 00112233445566778899AABBCCDD<ctrl-z>  
OK
```



## AT#I2CRD - Read from I2C

This command is used to read data from an I2C peripheral connected to module.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	No	No




AT#I2CRD=<sdaPin>,<scIPin>,<deviceId>,<registerId>,<len>

Execution command reads data from an I2C peripheral connected to module GPIOs. After the reading activity has been accomplished, the GPIOs will not be restored to the original setting. Use #GPIO command to see the status of the used GPIOs. To have information on GPIO pins refer to document [1].

Parameters:

Name	Type	Default	Description
<sdaPin>	integer	-	GPIO number for SDA. To know the range use #I2CRD test command.
<scIPin>	integer	-	GPIO number for SCL. To know the range use #I2CRD test command.
<deviceId>	hex	N/A	address of the I2C device (7 bits). The Least Significant Bit is used for read/write command, but in this #I2CCF implementation, it doesn't matter if the LSB is set to 0 or 1.  Address must be written in hexadecimal form without 0x.  10 bit address is also supported
Value:			



			<div>0÷3FF : addressing range extended to 10 bit</div>	
	<registerId>	hex	N/A	Register to read data from
				<div>Value:</div> <div>0÷FE : value must be written in hexadecimal form without 0x</div>
	<len>	integer	N/A	Number of data to receive <ol style="list-style-type: none"> <li>1. Data Read from I2C will be dumped in hexadecimal format</li> <li>2. If data requested are more than data available in the device, dummy data (normally 0x00 or 0xff) will be dumped</li> </ol>
				<div>Value:</div> <div>1÷254 : number of data to receive</div>
	<b>AT#I2CRD=?</b> Test command returns the range of available values for parameters <sdaPin>, <scIPin>, <deviceId>, <registerId>, <len>.			



Read 12 bytes from I2C device with address 0x20, starting from register address 0x10. SDA is mapped on GPIO\_02, SCL is mapped on GPIO\_03.





```
AT#I2CRD=2,3,20,10,12
#I2CRD: 00112233445566778899AABBCC
OK
```



## AT#I2CCF - Combined Format for I2C Writing and Reading

This command is used to write and read data to/from an I2C device using the I2C Combined Format. The module acts as an I2C master.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#I2CCF=<sdaPin>,<sclPin>,<deviceId>,<lenwr>,<lenrd>

The module, as master, transmits data to the slave and then, reads data from it through two GPIOs. Transfer direction is changed when writing section is ended. After the write/read activity has been accomplished, the GPIOs will not be restored to the original setting. Use #GPIO command to see the status of the used GPIOs. To have information on GPIO pins refer to document [1].

Parameters:

Name	Type	Default	Description
<sdaPin>	integer	-	GPIO number for SDA. To know the range use #I2CCF test command.
<sclPin>	integer	-	GPIO number for SCL. To know the range use #I2CCF test command.
<deviceId>	hex	N/A	address of the I2C device (7 bits). The Least Significant Bit is used for read/write command, but in this #I2CCF implementation, it doesn't matter if the LSB is set to 0 or to 1.  Address must be written in hexadecimal form without 0x.  10 bit address is also supported.
Value:			



		<div> <div>0÷3FF</div> <div>:</div> <div>addressing range extended to 10 bit</div> </div>	
<lenwr>	integer	N/A	number of data to write.
	Value:		
		<div> <div>0÷254</div> <div>:</div> <div>number of data to write.</div> </div>	
<lenrd>	integer	N/A	number of data to read.
	Value:		
		<div> <div>0÷254</div> <div>:</div> <div>number of data to read.</div> </div>	

#### Additional info:

- After entering the command, and if <lenwr> > 0, the module returns the prompt ">" and waits for the data to send. To complete the operation enter Ctrl-Z char (0x1A hex); to exit without writing the message enter ESC char (0x1B hex).

Data must be written in hexadecimal form without 0x.

If data are successfully sent, the response is OK, otherwise an error code is reported.



#### AT#I2CCF=?

Test command returns the range of available values for parameters <sdaPin>, <sciPin>, <deviceId>, <lenwr>, <lenrd>.



&lt;/&gt;

- Set GPIO\_2 as SDA, GPIO\_3 as SCL; Device I2C address is 0x20;  
First is send data 0x0a; after a "RESTART", 4 data bytes are read.

```
AT#I2CCF=2,3,20,1,4
>0a<ctrl-z>
#I2CCF: abcdef12
OK
```

The sequence is the following:

START - 0x20- 0x0a -RESTART - 0x21 - data read 1 -...- data read 4 - STOP

- Set GPIO\_2 as SDA, GPIO\_3 as SCL; Device I2C address is 0x20;  
read data:

```
AT#I2CCF=2,3,20,0,2
#I2CCF: abcd
OK
```

The sequence is the following:

START - 0x21- - data read 1 - data read 2 - STOP



## AT#TEMPMON - Temperature Monitor

This command is used to retrieve internal temperature information of the module.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#TEMPMON=<mod>[,<urcMode>[,<action>[,<hystTime>[,<GPIO>]]]]

Set command sets the internal temperature monitoring mode of the module, reads it, and enables/disables/triggers the presentation of the temperature monitoring message, that can be respectively an URC or an intermediate message according to the selected mode.

#TEMPMEAS: <level>,<value>

The temperature monitoring message parameters are described in the Unsolicited fields section.

Parameters:

Name	Type	Default	Description
<mod>	integer	0	select the temperature monitoring mode.
Values:			
<div>0 : only if &lt;mod&gt;=0 optional parameters of the command have meaning</div>			
<div>1 : triggers the measurement of the module internal temperature, reporting the result using the format shown above</div>			



<urcMode>	integer	0	URC presentation mode
<p>Values:</p> <p>.....</p> <p>0 : disables the presentation of the temperature monitoring URC.</p> <p>1 : enables the presentation of the temperature monitoring URC, whenever the module internal temperature reaches either operating or extreme levels.</p> <p>.....</p>			
<action>	integer	0	sum of integers, each representing the action to be done whenever the module internal temperature reaches either operating or extreme levels.
<p>Values:</p> <p>.....</p> <p>0 : no action</p> <p>1 : (01) activating of thermal mitigation according to thermal configuration file, see #TEMPCFG command</p> <p>2 : (10) output pin &lt;GPIO&gt; is tied HIGH when operating temperature bounds are reached; when the temperature is back to normal the output pin &lt;GPIO&gt; is tied LOW. If this &lt;action&gt; is required, it is mandatory to set the &lt;GPIO&gt; parameter too</p> <p>3 : (11) this value contains &lt;action=1&gt; and &lt;action=2&gt;, i.e. activate thermal mitigation and a GPIO indication. If this &lt;action&gt; is required, it is mandatory to set the &lt;GPIO&gt; parameter too.</p> <p>4 : same as 2</p>			



5÷7 : same as 3		
<hystTime>	integer -	dummy parameter in the range 0..255
<GPIO>	integer -	GPIO number. Valid range is any GPIO pin as described in #GPIO command. This parameter is needed and required only if <action> 2 or 3 is enabled.  To have hardware information about GPIO refer to document [1].



Unsolicited fields:

Name	Type	Description
<level>	integer	threshold level Values:  -2 : extreme low zone, see #TEMPCFG command  -1 : operate low zone, see #TEMPCFG command  0 : operate normal zone, see #TEMPCFG command  1 : operate up zone, see #TEMPCFG command  2 : extreme up zone, see #TEMPCFG command
<value>	integer	current temperature expressed in Celsius degrees.



#TEMPCFG command sets the thresholds levels. See there, also the description of the thermal mitigation configuration and its mechanism.



-  Last <action> and <GPIO> settings are saved in the file system.
-  Thermal mitigation is disabled automatically when using a laboratory test SIM.  
A SIM is a test SIM if it has an MCC of 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012 .



#### AT#TEMPMON?

Read command reports the current parameter settings for the command in the format:

#TEMPMON: <urcMode>,<action>[,<hystTime> [,<GPIO>]]



#### AT#TEMPMON=?

Test command reports the supported range of values for parameters <mod>, <urcMode>, <action>, <hystTime>, and <GPIO>.





## AT#TESTMODE - Test Mode Configuration

Set module in Test Mode for configuring and testing the POWER level (not signaling mode).

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#TESTMODE=<cmd>

The Test Mode is entered using the following commands according to the network technology:

AT#TESTMODE="TM" followed by AT#TESTMODE="INIT2G" for 2G networks

AT#TESTMODE="TM" followed by AT#TESTMODE="INIT4G" for 4G networks

Only after this set, AT#TESTMODE can be used with the other allowed commands. To exit from Test Mode and go back to Operative Mode, enter the command AT#TESTMODE="OM".

Parameter:

Name	Type	Default	Description
<cmd>	string	N/A	<p>identifies one of the commands listed in the Values: section. The command is a quoted string.</p> <p>PL4G and PL2G commands must be followed by the value of the &lt;pwr&gt; power transmission in tenths of dBm:  AT#TESTMODE="PL4G -100"  AT#TESTMODE="PL2G 300"</p> <p>CH4G command must be followed by the &lt;earfcn&gt; channel and &lt;bw&gt; bandwidth:  AT#TESTMODE="CHG4 20000 0"</p>



CH2G command must be followed by the <ch> channel and <band> band:  
AT#TESTMODE="CH2G 100 1"

Values:

"TM"	:	forces the module in Test Mode and reboot module
"OM"	:	forces the module in Operative Mode and reboot module
"INIT4G"	:	4G command: initialize Radio for 4G transmission
"CH4G earfcn bw"	:	4G command: set the earfcn UL or DL channel for transmitting and receiving and set the bandwidth
"PL4G pwr"	:	4G command: change the transmission power. Range is: -400 ÷ 200 in tenths of dBm
"TX4G"	:	4G command: starts the non-stop module transmission
"RL4G"	:	4G command: reads Rx power level. The value read is in tenths of dBm
"DEINIT4G"	:	4G command: de-initialize Radio for 4G transmission and reboot module
"INIT2G"	:	2G command: initialize Radio for 2G transmission
"CH2G ch band"	:	2G command: set the channel and band
"PL2G pwr"	:	2G command: change the transmission power. Range is: -400 ÷ 330 in tenths of dBm



"TX2G"	: 2G command: starts the non-stop module transmission
"RL2G"	: 2G command: reads Rx power level. The value read is in tenths of dBm
"DEINIT2G"	: 2G command: de-initialize Radio for 2G operations and reboot module
"ESC"	: stop the transmission. This command is valid for both 4G and 2G technologies
"TMGNSS"	: Start GNSS testmode
"WBIQGNSS [constellation]"	: Perform WBIQ GNSS test, optionally specifying the constellation (default is GPS)
"OMGNSS"	: Exit from GNSS testmode

Additional info:



<earfcn> UL	Band
18000 - 18599	1
18600 - 19199	2
19200 - 19949	3
19950 - 20399	4
20400 - 20649	5
21450 - 21799	8
23010 - 23179	12
23180 - 23279	13
23280 - 23379	14



23850 - 23999	18
24000 - 24149	19
24150 - 24449	20
26040 - 26689	25
26690 - 27039	26
27040 - 27209	27
27210 - 27659	28
27760-27809	31
131972 - 132671	66
133122 - 133471	71
133472-133521	72
134002 - 134181	85

<earfcn> DL	Band
0 - 599	1
600 - 1199	2
1200 - 1949	3
1950 - 2399	4
2400 - 2649	5
3450 - 3799	8
5010 - 5179	12
5180 - 5279	13
5280 - 5379	14
5850 - 5999	18
6000 - 6149	19
6150 - 6449	20
8040 - 8689	25



8690 - 9039	26
9040 - 9209	27
9210 - 9659	28
9870-9919	31
66436 - 67335	66
68586 - 68935	71
68936-68985	72
70366 - 70545	85

<bw>	Band (MHz)
0	1.4
1	3
2	5

<band>	Band	Channels
0	GSM-850	128-251
1	E-GSM-900	0-124, 955-1023
2	DCS-1800	512-885
3	PCS-1900	512-810

#### GNSS Constellations:

Code	Constellation
0	GPS
1	GLONASS
2	BEIDOU
3	GALILEO
9	All constellations



- ✦ Bands support varies depending on the product
- ✦ 2G support varies depending on the product
- ✦ It is not possible to read RX power level during an ongoing TX operation. If a read power level command is issued, transmission is stopped.
- ✦ For RL4G power level test, use a CW (continuous wave) signal with a frequency offset equal to the 40% of the selected bandwidth.  
e.g.  
Band 1 - BW=1.4MHz - ARFCN 400 (downlink) - 2150.000MHz  
CW signal must be set to 2150.560MHz  
LTE signal can be also used.  
e.g.  
Settings: Band 1, BW=1.4MHz, ARFCN 400 (downlink) corresponding to 2150.000MHz  
LTE signal must be set to 2150.000MHz and BW must be set to 1.4MHz
- ✦ The RL4G power level readout is valid in the -90dBm to -30dBm range
- ✦ The tolerance of the power value set with PL4G or read with RL4G is +/-2dB

It is recommended to save CFUN=1 in NVM, before issuing #TESTMODE

If the module is connected through a USB cable to the host, then it is mandatory to disable the "Telit USB WWAN Adapter" from the "Network adapters" list of the Windows Device Manager, otherwise the testmode could not work as expected even if the command returns OK.

Note that the name of the Telit adapter could differ a little.



## AT#TESTMODE?

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



#TESTMODE: <testModeStatus>

Additional info:

▶▶ Parameter meaning:

Name	Type	Default	Description
<testModeStatus>	integer	0	status
Values:			
0 : module is in Operative Mode			
1 : module is in Test Mode			



AT#TESTMODE=?

Test command returns the OK result code



This AT command could cause a reboot



Set Test Mode  
AT#TESTMODE="TM"  
OK  
Reboot



Initialize Test Mode for 4G operations

AT#TESTMODE="INIT4G"

OK

set B2 with 1.4 MHz bandwidth, download

AT#TESTMODE="CH4G 900 0"

OK

read power level

AT#TESTMODE="RL4G"

#TESTMODE: -711

OK

set B4 with 1.4 MHz bandwidth, upload

AT#TESTMODE="CH4G 20000 0"

OK

start transmission

AT#TESTMODE="TX4G"

OK

stop transmission

AT#TESTMODE="ESC"

OK

exit from Test Mode

AT#TESTMODE="OM"

OK

Reboot

Start GNSS Testmode

AT#TESTMODE="TMGNSS"

OK

Perform WBIQ test (GPS)

AT#TESTMODE="WBIQGNSS"

#TESTMODE: Count: 1, N0: 65.0 (dBHz), Freq: 100106 (Hz)

OK

Perform WBIQ test for BEIDOU constellation:

AT#TESTMODE="WBIQGNSS 2"

Count: 2, C/N0: 52.0 (dBHz), Freq: 2 (Hz)

OK

Perform WBIQ test for all constellations:

AT#TESTMODE="WBIQGNSS 9"

Count: 3

GPS C/N0: 50.0 (dBHz), GPS Freq: 100106 (Hz)

GLO C/N0: 0.0 (dBHz), GLO Freq: 0 (Hz)





BDS C/N0: 0.0 (dBHz), BDS Freq: 0 (Hz)

GAL C/N0: 0.0 (dBHz), GAL Freq: 0 (Hz)

OK

Exit from GNSS testmode

AT#TESTMODE="OMGNSS"

OK



## Power Down



## AT#REBOOT - Module Reboot

Immediate module reboot.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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.



### AT#REBOOT=?

Test command returns OK result code.



This AT command causes a reboot



Reboot the module

AT#REBOOT

OK

(the module reboots)



## AT#ENHRST - Periodic Reset

Enable or Disable the one shot or periodic unit reset

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#ENHRST=<mode>,<delay>

Set commands enables/disables the unit reset after the specified <delay> in minutes

Parameters:

Name	Type	Default	Description
<mode>	integer	0	Enable\Disable mode
Values: <div> <div>0 : disables the unit reset</div> <div>1 : enables the unit reset only one time (one shot reset)</div> <div>2 : enables periodically unit reset</div> </div>			
<delay>	integer	-	time interval in minutes after that the unit reboots



The settings are saved automatically in NVM only if old or new <mode> value is 2, i.e. unit set in periodic reset mode. Therefore, any change from 0 to 1 or conversely is not stored in NVM.



The command AT#ENHRST=1,0 causes the immediate module reboot. If it follows an AT command that stores some parameters in NVM, it is strongly recommended to insert a delay of at least 5 sec before issuing it, to permit the complete NVM



storing process.



### AT#ENHRST?

Read command reports the current parameter settings in the following format:

#ENHRST: <mode>[,<delay>,<remainingTime>]

Additional info:

►► Read command parameter for <mode> =1 or 2.

Name	Type	Default	Description
<remainingTime>	integer	-	time in minutes remaining before next reset



### AT#ENHRST=?

Test command reports supported range of values for parameters <mode> and <delay>.



This AT command causes a reboot



Example of #ENHRST usage and expected unit behavior.



- `AT#ENHRST=1,60`  
...  
Module reboots after 60 minutes
- `AT#ENHRST=1,0`  
Module reboots immediately
- `AT#ENHRST=2,40`  
...  
Module reboots after 40 minutes, and after every following power on, it will continue to reboot always after 40 minutes.



## AT#SHDN - Software Shutdown

This command turns the module OFF.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#SHDN

Execution command causes device to detach from the network and shut down. Before definitive shut down an OK response is returned.

When issuing the command any previous activity terminated and the device will not respond to any further command.

To turn it on again hardware pin ON/OFF must be tied low.

The maximum time to shut down the device, completely is 25 seconds.



### AT#SHDN=?

Test command returns OK result code.



## AT#SYSHALT - System Turn-Off

The execution command sets the module in SYSHALT state. To power down the module, the serial port (ASC0) must have the control signals CTS, DTR, DCD and RING low.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#SYSHALT?

Read command returns the current stored parameters in the following format:

# SYSHALT: <GPIORestore>,<DTRWakeUpEn>,<RebootEn>




Additional info:

►► Here are the parameters meanings.

Name	Type	Default	Description
<GPIORestore>	integer	0	select the GPIOs and serial ports pins setting
Values: <div>             0 : GPIOs and serial ports pins are left unchanged                           1 : GPIO and serial pins are set in input with pull down           </div>			
<DTRWakeUpEn>	integer	0	select the DTR behavior
Values: <div>             0 : DTR has no effect on module turned OFF by #SYSHALT           </div>			





	<div data-bbox="692 203 1342 315"> 1 : DTR transition from low to high turns on again the module turned off by #SYSHALT command </div> <div data-bbox="376 421 1334 495"> <div data-bbox="376 421 544 456">&lt;RebootEn&gt;</div> <div data-bbox="655 421 791 456">integer 1</div> <div data-bbox="975 421 1334 495">select how the module exits SYSHALT</div> </div> <div data-bbox="655 546 751 580"> Values: </div> <div data-bbox="692 640 1326 786"> 0 : module exits from SYSHALT and stays in detached mode like CFUN=4 status. To restore normal behavior, the user shall set CFUN=1 </div> <div data-bbox="692 835 1321 909"> 1 : module exits from SYSHALT performing a total reboot </div>
	<div data-bbox="264 1115 746 1151">  The parameters are not settable. </div>
	<div data-bbox="225 1272 456 1308">AT#SYSHALT=?</div> <div data-bbox="225 1323 1230 1361">Test command returns the supported range of parameters values in the format:</div> <div data-bbox="225 1377 616 1415"># SYSHALT: (0-1),(0-1),(0-1)</div>
	<div data-bbox="376 1563 1182 1601">AT#SYSHALT is a dummy command and does not have effect</div>



## AT#FASTSHDN - Fast Shutdown Configuration

This command can be used as a set command to configure a GPIO pin performing a fast shutdown when on it is forced a High to Low level transition. Or can be used as an execute command to force immediately a fast shutdown.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#FASTSHDN[=<enable>[,<GPIO>]]

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	-	selects the GPIO to execute the fast shutdown. When the selected <GPIO> pin goes from High to Low level and the <enable> is set to 1, the module execute immediately the fast shutdown.

Additional info:

►► The execution command #FASTSHDN<CR><LF> forces the module to execute immediately the fast shutdown.



The GPIO pin selected by the #FASTSHDN command must be used for this purpose only. If you need to use the selected GPIO pin for different activities, it must be free with the following command:

#FASTSHDN=0,<GPIO>



**AT#FASTSHDN?**

Read command reports the currently selected configuration in the format:

AT#FASTSHDN: <enable>,<GPIO>

**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
```



# AT#DGEN - Dying GASP Configuration

This command enables/disables the Dying GASP configuration, configures a GPIO pin to perform a specific behavior at dying gasp of module, can also be used to read the last dying event.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Required	Auto	No

AT#DGEN=<mode>[,<GPIO>,<Trigger>,<Action>,<URC>[,<text>,<text\_format>[,<SMS\_Num>] [,<cid>,<IPProtocol>[,<IPAddr:Port>]]]]

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enable/disable dying GASP behavior or read report
Values: <div> <div>0 : disable dying GASP</div> <div>1 : set the command parameters</div> <div>2 : read dying GASP statistics</div> </div>			
<GPIO>	integer	N/A	GPIO pin number. Max is the number of GPIO pins provided by the module. For information on the available GPIO pins use the test command.
Value:			



		1÷Max	:	GPIO pin identifier
<Trigger>	integer	0		GPIO Trigger used for event
		Values: ..... 0 : activate dying gasp when GPIO translates from high to low  1 : activate dying gasp when GPIO translates from low to high .....		
<Action>	string	0		Dying GASP Action
		Values: ..... 0 : disable both SMS and IP (TCP or UDP) connection  1 : send SMS  2 : use IP (TCP or UDP) connection  3 : send SMS and use IP (TCP or UDP) connection .....		
<URC>	integer	0		URC presentation mode
		Values: ..... 0 : disables the presentation of the notification URC .....		



	1	:	enables the presentation of the notification URC when GPIO interrupt is triggered	
<text>	string	-	<p>the format of text is determined by &lt;text_format&gt;.</p> <p>When &lt;text_format&gt; = 0 (text), content of &lt;text&gt; is a string of 8-bit ASCII text character. Max 160 chars.</p> <p>When &lt;text_format&gt; = 1 (binary), every 8-bit octet of the message must be written as two IRA character long hexadecimal numbers, e.g. an octet with integer value 30 (i.e. 0x1E) must be written as a string of two characters "1E" (IRA 49 and 69) it must be enter in uppercase.</p>	
<text_format>	integer	0	format of the <text> parameter	
	<p>Values:</p> <hr/> <p>0 : text</p> <p>1 : binary</p> <hr/>			
<SMS_Num>	string	-	<p>SMS Destination Number as string of 8-bit ASCII Characters. Max 20 chars.</p> <p>International format is requested (without '+'). This value is not mandatory if Action = 2</p>	
<cid>	string	-	<p>specifies a PDP context definition. To know the range, see +CGDCONT command</p>	
<IPProtocol>	integer	0	IP protocol used for socket connection.	
	<p>Values:</p>			



```

.....
0 : disable IP (both TCP and UDP) connection

1 : TCP protocol

2 : UDP protocol
.....

```

<IPAddr:Port>	string	-	IPv4 server address with the socket port. Number as string of 8bit ASCII Characters. Max 20 chars. If IPProtocol = 2 (UDP) local socket port will be the same of server socket port.
---------------	--------	---	--

#### Additional info:

- ▶▶ If <Action>=1 parameters <cid>, <IPProtocol>, and <IPAddr:Port> are not mandatory  
If <Action>=2 parameter <SMS\_Num> is not mandatory  
If <Action>=3, SMS has always more priority than IP connection  
If <IPProtocol>=0 parameter <IPAddr:Port> is not mandatory

- ▶▶ If <mode>=2 the command returns the following report:  
#DGSTAT: <TimeStamp>, <SMSAttemptedFlag>

If no report is present the result is:  
#DGSTAT: 0,0

Any additional parameter will report an error.

Name	Type	Default	Description
<TimeStamp>	string	-	timestamp of the last time power loss was detected and Dying Gasp feature was triggered.



<SMSAttemptedFlag>	integer	N/A	indicates whether device attempted to send message (by SMS, IP or both) in the last power loss event, does not guarantee network delivery.
--------------------	---------	-----	--

Values:

0 : message not attempted

1 : message attempted

►► If <URC>=1 the module returns the following unsolicited message in the format:  
#DGEN: <GPIO>, <text>

If parameter <Action>=0, not activated:  
#DGEN: <GPIO>

🔑 Full configuration is stored in NVM.

AT#DGEN?

Read command reports the current settings of parameters, in the format:

#DGEN: <mode>,<GPIO>, <Trigger>, <Action>, <URC>, <text> , <text\_format>,  
<SMS\_Num>,<cid>,<IPProtocol>,<IPAddr:Port>

At the very first boot no settings are present so read command will report a default message:

#DGEN: 0

AT#DGEN=?





Test command reports the supported range of the parameters values.



Set command (SMS only)

```
AT#DGEN=1,2,0,1,1,"shutdown",0,"01012345678"
```

OK

Set command (IP-TCP only)

```
AT#DGEN=1,2,0,2,1,"shutdown",0,,1,1,"192.168.0.10:8080"
```

OK

Set command (SMS and IP-UDP)

```
AT#DGEN=1,2,0,3,1,"shutdown",0,"01012345678",1,2,"192.168.0.10:8080"
```

OK

Read command

```
AT#DGEN?
```

```
AT#DGEN=1,2,0,3,1,"shutdown",0,"01012345678",1,2,"192.168.0.10:8080"
```

OK

Set command (active on PGIO=3 without sending messages)

```
AT#DGEN=1,3,0,0,1
```

OK

Set command (disable feature)

```
AT#DGEN=0
```

OK

Set command (activate with last valid configuration)

```
AT#DGEN=1
```

OK



## Easy Scan



## AT#CSURV - Network Survey

The command performs a survey on the selected band channels.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#CSURV[=[<s>,<e>]]

Issuing AT#CSURV<CR>, a full band scan is performed on 2G and 4G bands.

<s> and <e> parameters are dummy parameters and are supported only for backward compatibility. The command responds with the following string:

Network survey started...

After a while, a list of network survey information text lines, one for each received carrier, is reported. The format of network survey information text lines depends on technology (2G or 4G).

The #CSURV output ends in two ways, depending on the last #CSURVF setting.

If AT#CSURVF=0 or AT#CSURVF=1 the output will end with the string:

Network survey ended

If AT#CSURVF=2 the output will end with the string:

Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

The network survey information text lines are described in the Additional info sections.

Parameters:

Name	Type	Default	Description
<s>	integer	-	dummy
<e>	integer	-	dummy

Additional info:



## ▶▶ 2G Networks

Network survey information text lines:

```
arfcn: <arfcn> bsic: <bsic> rxLev: <rxLev> ber: <ber> mcc: <mcc> mnc: <mnc>
lac: <lac> cellId: <cellId> cellStatus: <cellStatus> numArfcn: <numArfcn> arfcn:
<CR><LF><CR><LF><CR><LF>
```

Name	Type	Default	Description
<arfcn>	integer	-	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel)
<bsic>	integer	-	base station identification code; if #CSURVF last setting is 0, <bsic> is a decimal number, else it is at the most a 2-digits octal number
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<ber>	integer	-	always 0, dummy parameter
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2-digits number; it is the mobile network code
<lac>	integer	-	location area code; if #CSURVF last setting is 0, <lac> is a decimal number, else it is a 4-digits hexadecimal number
<cellId>	integer	-	cell identifier; if #CSURVF last setting is 0, <cellId> is a decimal number, else it is a 4-digits hexadecimal number
<cellStatus>	string	N/A	cell status



Values:

CELL_SUITABLE	:	C0 is a suitable cell
CELL_LOW_PRIORITY	:	the cell is low priority based on the received system information
CELL_FORBIDDEN	:	the cell is forbidden
CELL_BARRED	:	the cell is barred based on the received system information
CELL_LOW_LEVEL	:	the cell <rxLev> is low
CELL_OTHER	:	none of the above (e.g. exclusion timer running, no BCCH available, etc.)

<numArfcn> integer - always 0, dummy parameter

## ►► 4G Networks

Network survey information text lines for 4G network:

earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> cellId: <cellId> tac: <tac> cellIdentity: <cellIdentity> rsrp: <rsrp> rsrq: <rsrq>

or for NBIoT

earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> NBIoTcellid: <cellId> tac: <tac> cellIdentity: <cellIdentity> rsrp: <rsrp> rsrq: <rsrq>

Name	Type	Default	Description
------	------	---------	-------------



<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<tac>	integer	-	Tracking Area Code. If #CSURVF last setting is 0, <tac> is a decimal number, else it is a 4-digits hexadecimal number.
<cellId>	integer	-	Physical cell identifier, if #CSURVF last setting is 0, <cellId> is a decimal number, else it is a hexadecimal number.
<cellIdentity>	integer	-	Cell identifier, if #CSURVF last setting is 0, <cellIdentity> is a decimal number, else it is a hexadecimal number.  If value cannot be retrieved then value is reported as 0.
<rsrp>	integer	-	Reference Signal Received Power.
<rsrq>	integer	-	Reference Signal Received Quality.

►► #CSURV end output parameters if AT#CSURVF=2:

Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

Name	Type	Default	Description
<NoARFCN>	integer	-	number of scanned frequencies
<NoBCCH>	integer	-	number of found BCCH





- Command output (CSURVF=0)

AT#CSURV

Network survey started ...

arfcn: 110 bsic: 76 rxLev: -62 ber: 0 mcc: 222 mnc: 88 lac: 24503 cellId: 4760  
cellStatus: CELL\_SUITABLE numArfcn: 0 arfcn:

...

arfcn: 37 bsic: 61 rxLev: -62 ber: 0 mcc: 222 mnc: 10 lac: 20052 cellId: 39102  
cellStatus: CELL\_SUITABLE numArfcn: 0 arfcn:

earfcn: 5230 rxLev: -85 mcc: 001 mnc: 02 cellId: 3 tac: 1 cellIdentity: 27447555  
rsrp: -119 rsrq: -19

...

earfcn: 6247 rxLev: -95 mcc: 293 mnc: 41 NBloTcellid: 81 tac: 10043  
cellIdentity: 154675411 rsrp: -114 rsrq: -18

Network survey ended

OK

- Command output (CSURVF=1)

AT#CSURV

Network survey started ...

arfcn: 102 bsic: 70 rxLev: -47 ber: 0 mcc: 222 mnc: 88 lac: 5FB7 cellId: 1281  
cellStatus: CELL\_SUITABLE numArfcn: 0 arfcn:

...

arfcn: 49 bsic: 60 rxLev: -80 ber: 0 mcc: 222 mnc: 10 lac: 4E54 cellId: 6A19  
cellStatus: CELL\_SUITABLE numArfcn: 0 arfcn:

earfcn: 5230 rxLev: -85 mcc: 001 mnc: 02 cellId: 0003 tac: 0001 cellIdentity:  
1A2D103 rsrp: -113 rsrq: -15

...



earfcn: 6446 rxLev: -93 mcc: 293 mnc: 40 NBloTcellid: 0185 tac: 27F2  
cellIdentity: 7ED20 rsrp: -106 rsrq: -12

Network survey ended

OK





## AT#CSURVC - Network Survey (Numeric Format)

This command performs a survey on the selected band channels. The return message uses only the numeric format.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#CSURVC=[<s>,<e>]**

Execution command performs a quick survey on channels belonging to the band selected by last #BND command issue, starting from channel <s> to channel <e>. The information provided by this command is the same as that provided by #CSURV command. The difference is that the output of #CSURV is in numeric format only, the parameters names are not reported

Issuing AT#CSURC<CR>, a full band scan is performed. The command responds with the following string:

Network survey started...

After a while, a list of network survey information text lines in numeric format, one for each received carrier, is reported. The format of network survey information text lines depends on technology (2G or 4G) and BCCH (BCCH-Carrier or non BCCH-Carrier).

The #CSURVC output ends in two ways, depending on the last #CSURVF setting.

If AT#CSURVF=0 or AT#CSURVF=1 the output will end with the string:

Network survey ended

If AT#CSURVF=2 the output will end with the string:

Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)

The network survey information text lines are described in the Additional info sections.

Parameters:

Name	Type	Default	Description
<s>	integer	-	starting channel, see #CSURV command.
<e>	integer	-	ending channel, see #CSURV command.



## Additional info:

### ► 2G Networks, for BCCH-Carrier

Network survey information text lines:

```
<arfcn>,<bsic>,<rxLev>,<ber>,<mcc>,<mnc>,<lac>,<cellId>,<cellStat>,<numArfcn>
<CR><LF><CR><LF><CR><LF>
```

Name	Type	Default	Description
<arfcn>	integer	-	C0 carrier assigned radio channel (BCCH - Broadcast Control Channel)
<bsic>	integer	-	base station identification code; if #CSURVF last setting is 0, <bsic> is a decimal number, else it is at the most a 2-digits octal number
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)
<ber>	integer	-	always 0, dummy parameter
<mcc>	hex	-	hexadecimal 3-digits number; it is the mobile country code
<mnc>	hex	-	hexadecimal 2-digits number; it is the mobile network code
<lac>	integer	-	location area code; if #CSURVF last setting is 0, <lac> is a decimal number, else it is a 4-digits hexadecimal number
<cellId>	integer	-	cell identifier; if #CSURVF last setting is 0, <cellId> is a decimal number, else it is a 4-digits hexadecimal number
<cellStat>	string	N/A	cell status



Values:

CELL_SUITABLE	:	C0 is a suitable cell
CELL_LOW_PRIORITY	:	the cell is low priority based on the received system information
CELL_FORBIDDEN	:	the cell is forbidden
CELL_BARRED	:	the cell is barred based on the received system information
CELL_LOW_LEVEL	:	the cell <rxLev> is low
CELL_OTHER	:	none of the above (e.g. exclusion timer running, no BCCH available, etc.)

<numArfcn> integer - always 0, dummy parameter

## ► 2G Networks, for non BCCH-Carrier

Network survey information text lines:

<arfcn>,<rxLev>  
<CR><LF><CR><LF><CR><LF>

Name	Type	Default	Description
<arfcn>	integer	-	decimal number; it is the RF channel
<rxLev>	integer	-	decimal number; it is the reception level (in dBm)



## ►► 4G Networks

Network survey information text lines:

<earfcn>,<rxLev>,<mcc>,<mnc>,<cellId>,<tac>,<cellIdentity>,<rsrp>,<rsrq>

Name	Type	Default	Description
<earfcn>	integer	-	E-UTRA Assigned Radio Channel.
<tac>	integer	-	Tracking Area Code. If #CSURVF last setting is 0, <cellId> is a decimal number, else it is a 4-digits hexadecimal number.
<cellId>	integer	-	Physical cell identifier, if #CSURVF last setting is 0, <cellId> is a decimal number, else it is a hexadecimal number.
<cellIdentity>	integer	-	Cell identifier, if #CSURVF last setting is 0, <cellIdentity> is a decimal number, else it is a hexadecimal number.  If value cannot be retrieved then value is reported as 0.
<rsrp>	integer	-	Reference Signal Received Power.  If value cannot be retrieved then value is reported as 0.
<rsrq>	integer	-	Reference Signal Received Quality.  If value cannot be retrieved then value is reported as 0.

## ►► #CSURVC end output parameters if AT#CSURVF=2:

Network survey ended (Carrier: <NoARFCN> BCCh: <NoBCCh>)



Name	Type	Default	Description
<NoARCFN>	integer	-	number of scanned frequencies
<NoBCCH>	integer	-	number of found BCCH



2G Network, for BCCH-Carrier

AT#CSURVC

Network survey started ...

1018,21,-73,0.00,222,01,54717,14887,0,0

1023,50,-78,0.00,222,01,54717,14886,0,0

1009,10,-85,0.00,222,01,54717,21093,0,0

...

Network survey ended

OK

4G Network

AT#CSURVC

Network survey started ...

5110,-95,136,19A,10D,2700,BBA7211,0.00,0.00

5110,-95,139,064,10D,2700,BBA7211,0.00,0.00

675,-98,136,104,1BE,7B71,1F4A90E,0.00,0.00



```
675,-98,137,1EA,1BE,7B71,1F4A90E,0.00,0.00
5230,-81,137,1E0,19A,9B01,25FFA03,0.00,0.00
5110,-73,136,19A,10E,0,0,-99.50,-17.19
5110,-72,136,19A,C3,0,0,-105.50,-23.63
5110,-73,136,19A,E6,0,0,-102.69,-20.69
444,0,136,104,8E,EE46,1F4A9CB,0.00,0.00
```

```
...
```

```
Network survey ended
```

```
OK
```



## AT#CSURVF - Network Survey Format

The command configures the numbers format used in the messages related to the surveying of the network bands channels.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#CSURVF=[<format>]**

Set command configures the numbers format in each information text line of the network survey message (Easy Scan (R)).

Parameter:

Name	Type	Default	Description
<format>	integer	0	format of some numbers (see #CSURV and #CSURVC) in each network survey information text line
<p>Values:</p> <p>.....</p> <p>0 : Decimal</p> <p>1 : Hexadecimal</p> <p>2 : Hexadecimal and extended network survey end message format</p> <p>.....</p>			



**AT#CSURVF?**

Read command reports the current format of the numbers in each network survey information text line, as follows:

#CSURVF: <format>



**AT#CSURVF=?**

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



## AT#CSURVNLF - Network Survey CR LF Removing

This command enables/disables the automatic <CR><LF> removing from each network survey information text line.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#CSURVNLF=[<value>]

Parameter:

Name	Type	Default	Description
<value>	integer	0	enables/disables the automatic <CR><LF> removing from each network survey information text line
Values:			
.....			
0	:	disables <CR><LF> removing; they will be present in the information text line	
1	:	enables <CR><LF> removing from information text line	
.....			



AT#CSURVNLF?

Read command reports whether the automatic <CR><LF> removing from each network survey information text line is currently enabled or not, in the format:

<value>



AT#CSURVNLF=?

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





# AT#CSURVEXT - Extended Network Survey

The command is present only for backward compatibility.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#CSURVEXT=[<value>]

Parameter:

Name	Type	Default	Description
<value>	integer	0	dummy parameter
Values:			
.....			
0	:	dummy value	
1	:	dummy value	
2	:	dummy value	
.....			



AT#CSURVEXT?

Read command reports current dummy value.

#CSURVEXT: <value>



AT#CSURVEXT=?

Test command reports the range of values for dummy parameter <value>.



# Jamming Detection and Report



## AT#JDRENH2 - Enhanced Jamming Detection and Report

This command enables/disable jamming detection, and reports the relative result to the user.



[1] Hardware Design Guide of the used module

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#JDRENH2=<mode>[,<sat2G>,<unused>,<carrNum2G>,<pRxLevT2G>,<unused>,<unused>,<unused>[,<P\_RSSI\_T4G>[,<P\_RSRQ\_T4G>[,<unused>]]]]

The set command performs the following activities:

- enables/disables the detection of the presence of jamming in the module coverage.
- selects one of the following two reports mode or both: on dedicated GPIO, by means of the URC, or GPIO + URC.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enable/disable jamming detection and select reporting mode
Values:			
<div>0 : disable jamming detection</div> <div>1 : enable jamming detection, and report its condition on a GPIO pin, see Additional info section</div>			



		<p>2 : enable jamming detection, and report its condition with an URC, see Additional info section</p> <p>3 : enable jamming detection, and report its condition as &lt;mode&gt;=1 and &lt;mode&gt;=2</p> <p>4 : enable jamming detection, and report its condition with an URC every 3 sec, see &lt;mode&gt;=2</p> <p>5 : enable jamming detection, and report its condition as &lt;mode&gt;=1 and &lt;mode&gt;=4</p> <p>6 : not used</p> <p>.....</p>	
<sat2G>	integer 60	is the starting absolute threshold of RSSI 2G Network. After a frequency scan in 2G bands, if the measured power of a carrier is greater than <sat2G> threshold, that carrier is counted as possible jammed carrier.	
	Value:	<p>.....</p> <p>0÷63 : threshold values</p> <p>.....</p>	
<unused>	integer N/A	unused parameter	
	Value:	<p>.....</p> <p>0 : dummy value</p> <p>.....</p>	



<carrNum2G>	integer	100	is the minimum number of possible jammed carriers to consider that the module is under jamming condition
Value:			
.....			
0÷200 : number of carriers			
.....			
<pRxLevT2G>	integer	15	set the threshold of RxLev in 2G Network. The RxLev_Thr threshold is calculated as shown below:
$\text{RxLev\_Thr} = \text{RxLev\_Av} * (1 + (\text{<pRxLevT2G>/100}))$ <p>where RxLev_Av is the average of the last 10 RxLev measures.</p>			
Value:			
.....			
0÷100 : values used to compute RxLev_Thr threshold			
.....			
<unused>	integer	N/A	unused parameter
Value:			
.....			
0 : dummy value			
.....			
<unused>	integer	N/A	unused parameter
Value:			



		<div>0 : dummy value</div>	
<unused>	integer N/A	unused parameter	
		Value: <div>0 : dummy value</div>	
<P_RSSI_T4G>	integer 10	Set the threshold of RSSI. The threshold (T_RSSI_MAX/T_RSSI_MIN) is calculated as:  $T\_RSSI\_MAX = RSSI\_Avg * (1 + (<P\_RSSI\_T4G>/100))$  $T\_RSSI\_MIN = RSSI\_Avg * (1 -$  where RSSI_Avg is the average of the last 50 RSSI measures.	
		Value: <div>0÷100 : RSSI threshold values</div>	
<P_RSRQ_T4G>	integer 20	Set the threshold of RSRQ. The threshold (RSRQ_Thr) is calculated as  $RSRQ\_Thr = RSRQ\_Avg * (1 -$  where RSRQ_Avg is the average of the last 50 RSRQ measures.	
		Value:	



<div> <div>0÷100</div> <div>:</div> <div>RSRQ threshold values</div> </div>		
<unused>	integer 0	unused parameter
<div>Value:</div> <div> <div>0</div> <div>:</div> <div>dummy value</div> </div>		

Additional info:

- ▶▶

<mode>=1

The jamming condition is reported on pin GPIO\_02 (JDR):

GPIO\_02 (JDR) = Low, Normal Operating Condition

GPIO\_02 (JDR) = High, Jammed Condition

To have information on GPIO\_02 pin, refer to document [1]. GPIO\_02 pin can be used also by other functionality, see #GPIO command.
- ▶▶

<mode>=2

the jamming condition is reported with a single URC on serial line, in the format:

#JDR: <status>

Unsolicited field:

Name	Type	Description
<status>	string	jamming condition status, <mode>=2
Values:		



JAMMED RAT	:	jamming condition detected, <RAT> is the Radio Access Technology for operates: GSM or LTE.
OPERATIVE RAT	:	Normal Operating condition restored. Status shown only after a jamming condition has occurred.



AT#JDRENH2?

Read command reports the current parameters values, in the format:

#JDRENH2:<mode>,<sat2G>,0,<carrNum2G>,<pRxLevT2G>,0,0,0,<P\_RSSI\_T4G>,<P\_RSRQ\_T4G>,0



AT#JDRENH2=?

Test command reports the supported range of the parameters values.





## AT#JDR4GCFG - LTE Jamming Detection Threshold Configuration

The command configures the LTE Jamming Detection thresholds.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#JDR4GCFG=<P\_RSRP\_T4G>,<P\_RSQ\_T4G>,<Initial\_Delay>[,<Sampling\_Number>[,<P\_RSSI\_S4G>[,<UNUSED\_4>[,<UNUSED\_5>[,<UNUSED\_6>[,<UNUSED\_7>]]]]]]

Set command allows to configure the LTE Jamming Detection thresholds. After configuration, use the #JDRENH2 command to enable/disable LTE jamming detection and select reporting mode.

Parameters:

Name	Type	Default	Description
<P_RSRP_T4G>	integer	10	set the threshold of RSRP. The threshold (RSRP_Thr) is calculated as: $RSRP\_Thr = RSRP\_Av * (1 + ($ where RSRP_Av is the average of the last 8 RSRP measures
Value: ..... 0÷100 : threshold of RSRP .....			
<P_RSQ_T4G>	integer	20	set the threshold of RSQ. The threshold (RSQ_Thr) is calculated as: $RSQ\_Thr = RSQ\_Av * (1 - ($ where RSQ_Av is the average of the last 8 RSQ measures
Value: ..... 0÷100 : threshold of RSQ .....			



<Initial_Delay>	integer	500	Sets the delay in tens of ms from power ON, to the beginning of the RSSI samples collection
Value:			
.....			
0÷1000 : Value of Initial Delay			
.....			
<Sampling_Number>	integer	30	Number of samples required to validate the Jamming condition.
Value:			
.....			
1÷200 : Number of samples			
.....			
<P_RSSI_S4G>	integer	-50	RSSI threshold level in dBm, above which the Jamming condition is detected.
Value:			
.....			
120÷20 : Value of RSSI Threshold			
.....			
<UNUSED_4>	mixed	-	reserved for future use
<UNUSED_5>	mixed	-	reserved for future use
<UNUSED_6>	mixed	-	reserved for future use
<UNUSED_7>	mixed	-	reserved for future use



#### AT#JDR4GCFG?

Read command returns the current settings in the format:

#JDR4GCFG: <P\_RSRP\_T4G>,<P\_RSRQ\_T4G>,>,>,<Initial\_Delay>,<Sampling\_Number>,<P\_RSSI\_S4G>,0,0,0,0



Regardless the values used for parameters <UNUSED\_4> ... <UNUSED\_7>, the read command returns always 0.



AT#JDR4GCFG=?

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



## Packet Domain



## AT+CGDCONT - Define PDP Context

Define PDP Context.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT+CGDCONT=

[<cid>[,<PDP\_type>[,<APN>[,<PDP\_addr>[,<d\_comp>[,<h\_comp>[,<IPv4AddrAlloc>[,<emergencyIndication>]]]]]]]]

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

Parameters:

Name	Type	Default	Description
<cid>	integer	-	(PDP Context Identifier) numeric parameter which specifies a particular PDP context definition.  1..max - where the value of max is returned by the Test command.
<PDP_type>	string	N/A	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.
Values:			
<div> "IP" : Internet Protocol </div>			
<div> "IPV6" : Internet Protocol version 6 </div>			



			<p>"IPV4V6" : Virtual introduced to handle dual IP stack UE capability.</p> <p>Non-IP : Transfer of Non-IP data to external packet data network</p> <p>.....</p>
<APN>	string	-	(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is empty ("") or omitted, then the subscription value will be requested.
<PDP_addr>	string	-	A string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the +CGPADDR command.
<d_comp>	integer	0	Numeric parameter that controls PDP data compression.
			<p>Values:</p> <p>.....</p> <p>0 : PDP data compression off (default if value is omitted)</p> <p>1 : PDP data compression on</p> <p>2 : V.42bis (applicable only for products supporting GSM)</p> <p>.....</p>
<h_comp>	integer	0	Numeric parameter that controls PDP header compression.
			Values:



<div> <div>0 : PDP header compression off (default if value is omitted)</div> <div>1 : PDP header compression on</div> <div>2 : RFC1144 (applicable only for products supporting GSM; applicable for SNDCP only)</div> <div>3 : RFC2507 (applicable only for products supporting GSM)</div> <div>4 : RFC3095 (applicable only for products supporting GSM; applicable for PDCP only)</div> </div>			
<IPv4AddrAlloc>	integer	0	a numeric parameter that controls how the MT/TA requests to get the IPv4 address information.
<div>Value:</div> <div> <div>0 : IPv4 Address Allocation through NAS Signaling (default)</div> </div>			
<emergencyIndication>	integer	0	a numeric parameter used to indicate whether the PDP context is for emergency bearer services or not.
<div>Value:</div> <div> <div>0 : PDP context is not for emergency bearer services (default)</div> </div>			





To erase (delete) all params for a <cid> give as follows:

```
AT+CGDCONT=<cid>,<pdp_type>,""
```

or

```
AT+CGDCONT=<cid>
```



It is not possible to set the same <APN> (even if empty) for different <cid>'s.

Command will return an error.



It is not possible to delete <cid> number 3 when Verizon customization is active.

Command will return an OK but without actually deleting the profile.



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>,0,0<CR><LF>
```

```
+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,0,0[...]
```



AT+CGDCONT=?

Test command returns values supported as a compound value.



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

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

```
AT+CGDCONT=?
+CGDCONT: (1-6),"IP",,(0-2),(0-4),0,0
+CGDCONT: (1-6),"IPV6",,(0-2),(0-4),0,0
+CGDCONT: (1-6),"IPV4V6",,(0-2),(0-4),0,0
OK
```





## 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
Required	No	No



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:  for a static address, it will be the one set by the +CGDCONT command when the context was defined



for a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>; <PDP\_addr> is omitted if none is available



AT+CGPADDR=?

Test command returns a list of defined <cid>.



```
AT#SGACT=3,1
#SGACT: xxx.yyy.zzz.www
OK

AT+CGPADDR=3
+CGPADDR: 3,"xxx.yyy.zzz.www"
OK

AT+CGPADDR=?
+CGPADDR: (3)
OK
```



## AT#AUTOATT - Auto-Attach Property

Execution command has no effect and is included only for backward compatibility.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#AUTOATT=[<auto>]

Parameter:

Name	Type	Default	Description
<auto>	integer	0	dummy parameter
Values:			
.....			
0	:	dummy parameter	
.....			
1	:	dummy parameter	
.....			



Entering AT#AUTOATT= returns OK but has no effect.



AT#AUTOATT?

Read command reports <auto> value, in the format:

#AUTOATT: <auto>



AT#AUTOATT=?

Test command reports available values for parameter <auto>.



## AT#BSRCFG - Buffer Status Reporting (BSR) Configuration

This command configures the Buffer Status reporting timers.

SIM Presence	Setting saved	Can be aborted
Required	Specific profile	No



**AT#BSRCFG=<idleTo>**

Execution command sets the idle timeout value of Buffer Status Reporting.

Parameter:

Name	Type	Default	Description
<idleTo>	integer	N/A	Timer value in seconds
Value:			
<div> <div>1÷1800</div> <div>:</div> <div>Timer value in seconds</div> </div>			



The BSR setting has only effect on LTE Cat.M and NB-IoT (User Plane) technologies.



**AT#BSRCFG?**

Read command returns the current <idleTo> time in the format:

#BSRCFG: <idleTo>



**AT#BSRCFG=?**

Test command reports the supported range of values of <idleTo> in seconds.



## AT#MSCLASS - Multislot Class Control

Set command sets the GPRS multislot class.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#MSCLASS=[<class>[,<autoattach>]]

Parameters:

Name	Type	Default	Description
<class>	integer	33	GPRS multislot class.
Values:			
.....			
1÷12 : class			
30÷33 : class			
.....			
<autoattach>	integer	0	specify when the new multislot class will be enabled.
Values:			
.....			
0 : the new multislot class is enabled only at the next detach/attach or after a reboot.			
1 : the new multislot class is enabled immediately, automatically forcing a detach / attach procedure only in case of GSM network registered			
.....			



AT#MSCLASS?

Read command reports the current value of the multislot class in the format:

#MSCLASS: <class>



AT#MSCLASS=?



Test command reports the range of available values for both parameters <class> and <autoattach>.



# AT+CGAUTH - Define PDP Context Authentication Parameters

This command allows the TE to specify authentication parameters for a PDP context.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT+CGAUTH=<cid>,<auth\_type>,<username>,<password>

Set command allows the TE to specify authentication parameters for a PDP context identified by the (local) context identification parameter <cid>, used during the PDP context activation and the PDP context modification procedures.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context definition, see the +CGDCONT command.
<auth_type>	integer	0	selects the authentication protocol used for this PDP context.
Values: <div> <div>0</div> <div>:</div> <div>no authentication</div> </div> <div> <div>1</div> <div>:</div> <div>PAP authentication</div> </div> <div> <div>2</div> <div>:</div> <div>CHAP authentication</div> </div>			
<username>	string	-	User name for access to the IP network
<password>	string	-	Password for access to the IP network



AT+CGAUTH?



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

+CGAUTH: <cid1>,< auth\_type1 >,<username1><CR><LF>

...

+CGAUTH:<cidmax>,<auth\_typemax >,<usernamemax><CR><LF>



AT+CGAUTH=?

Test command reports the supported range of values for parameters <cid>, <auth\_type> and the maximum lengths for parameters <username> and <password>.





## 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
Required	Auto	No



### 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.

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
------	------	---------	-------------



<bearerId>	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.





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+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
Not required	No	No





AT+CGPIAF=[<IPv6\_AddressFormat>[,<IPv6\_SubnetNotation>[,<IPv6\_LeadingZeros>[,<IPv6\_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: <div> <div>0</div> <div>:</div> <div>use IPv4-like dot-notation. IP addresses, and subnetwork mask if applicable, are dot-separated.</div> </div> <div> <div>1</div> <div>:</div> <div>use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space.</div> </div>			
<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:			



	<div> <div>0 : both IP address, and subnet mask are started explicitly, separated by a space.</div> <div>1 : the printout format is applying /(forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation.</div> </div>	
<IPv6_LeadingZeros>	integer 0	selects whether leading zeros are omitted or not. Setting does not apply if IPv6 address format <IPv6_AddressFormat>=0.
	Values:	
	<div>0 : leading zeros are omitted.</div> <div>1 : leading zeros are included.</div>	
<IPv6_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:	
	<div>0 : no zero compression.</div> <div>1 : use zero compression.</div>	
 <b>AT+CGPIAF?</b> Read command returns the current parameter setting.		
 <b>AT+CGPIAF=?</b> Test command returns values supported as compound values.		

```
</> AT+CGPIAF=0,0,0,0
OK
AT#SGACT=1,1
#SGACT: 252.1.171.171.205.205.239.224.0.0.0.0.0.0.1
OK
AT+CGPIAF=1,0,0,0
OK
AT#SGACT=1,1
#SGACT: FC01:ABAB:CD:CD:EFE0:0:0:0:1
OK
```



# 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
Required	No	No



AT+CGACT=[<state>[,<cid>[,<cid>][,...]]]

Parameters:

Name	Type	Default	Description
<state>	integer	N/A	activate/deactivate the PDP context
Values: <div> <div>0 : deactivate</div> <div>1 : activate</div> </div>			
<cid>	integer	-	specifies a PDP context definition (see +CGDCONT command)



Only three <cid>s can be activated at the same time.





if no <cid>s are specified, the activation form of the command activates the first three defined contexts. The deactivation form deactivates all the active contexts.



#### AT+CGACT?

Read command returns the current activation state for all the defined PDP contexts in the format:

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



#### AT+CGACT=?

Test command reports information on the supported PDP context activation states <state>.



```
AT+CGACT=1,1
OK
```

```
AT+CGACT?
+CGACT: 1,1
OK
```





## 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
Required	Specific profile	No



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: <div> <div>0</div> <div>: 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.</div> </div> <div> <div>1</div> <div>: discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.</div> </div> <div> <div>2</div> <div>: 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.</div> </div>			
<bfr>	integer	0	controls the effect on buffered codes when <mode> 1 or 2 is entered.



#### Values:

- 0 : TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered.
- 1 : TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)

#### 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.



#### Here are some examples:

- 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 context deactivation. The <cid> that was used to activate the context is provided if known to TA.  
+CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>]
- The mobile equipment has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.  
+CGEV: ME\_DETACH
- The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.  
+CGEV: NW\_DETACH



# AT#PPPCFG - PPP Configuration

This command configures the PPP mode.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#PPPCFG=<mode>

Set command sets the active/passive PPP mode

Parameter:

Name	Type	Default	Description
<mode>	integer	1	sets PPP mode
Values:			
.....			
0	:	passive mode	
1	:	active mode	
.....			



AT#PPPCFG?

Read command returns the current <mode>, in the format:

#PPPCFG: <mode>



AT#PPPCFG=?

Test command returns the range of available values for parameters <mode> .



## 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
Not required	No	No



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>]]

extra long format:

+CGREG:<stat>[, [<lac>], [<ci>], [<AcT>], [<rac>], [, [, [<ActiveTime>], [<PeriodicRAU>], [<GPRSREADYtimer>]]]]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	<p>enables/disables the network registration unsolicited result code (URC), and selects one of the available formats.</p> <p>The following events triggers the URC:</p> <p>URC short format is displayed every time there is a change in the network registration status</p> <p>URC long or extra long format is displayed, according to &lt;mode&gt; value, every time there is a change of the network cell.</p>
<p>Values:</p> <hr/> <p>0 : disable the network registration unsolicited result code</p>			




- 1 : enable the network registration unsolicited result code, and selects the short format
- 2 : enable the network registration unsolicited result code, and selects the long format (includes the network cell identification data)
- 4 : enable the network registration and location information unsolicited result code (extra long format)

Unsolicited fields:

Name	Type	Description
<stat>	integer	registration status of the module Values: <ul style="list-style-type: none"> <li>0 : not registered, terminal is not currently searching a new operator to register to</li> <li>1 : registered, home network</li> <li>2 : not registered, but terminal is currently searching a new operator to register to</li> <li>3 : registration denied</li> <li>4 : unknown</li> <li>5 : registered, roaming</li> </ul>
<lac>	string	the parameter reports: Local Area Code when <AcT>=0 Tracking Area Code when <AcT>=8 or 9
<ci>	string	cell ID in hexadecimal format



<AcT>	integer	access technology of the registered network. Values:  <table> <tr> <td>0</td><td>:</td><td>GSM</td></tr> <tr> <td>8</td><td>:</td><td>CAT M1</td></tr> <tr> <td>9</td><td>:</td><td>NB IoT</td></tr> </table>	0	:	GSM	8	:	CAT M1	9	:	NB IoT
0	:	GSM									
8	:	CAT M1									
9	:	NB IoT									
<rac>	string	routing area code (one byte) in hexadecimal format									
<ActiveTime>	string	one byte in an 8 bit format. Indicates the Active Time value (T3324) allocated to the UE. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008.									
<PeriodicRAU>	string	one byte in an 8 bit format. Indicates the extended periodic RAU value (T3312) allocated to the UE. The extended periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008.									
<GPRSREADYtimer>	string	one byte in an 8 bit format. Indicates the GPRS READY timer value (T3314) allocated to the UE. The GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008.									
 <lac>, <ci>, <AcT>, and <rac> network information is reported by URC only if <mode>=2 or 4, and the module is registered on some network cell.											



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.



AT+CGREG=?

Test command returns supported values for parameter <mode>.





## 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
Required	No	No



AT+CGATT=<state>

Parameter:

Name	Type	Default	Description
<state>	integer	N/A	state of PS attachment
Values:			
.....			
0	:	detached	
1	:	attached	
.....			



AT+CGATT?

Read command returns the current PS state in the format:

+CGATT: <state>



AT+CGATT=?

Test command returns the values range of the <state> parameter.



```
</> AT+CGATT?  
+CGATT: 0  
OK  
  
AT+CGATT=?  
+CGATT: (0,1)  
OK  
  
AT+CGATT=1  
OK
```



## AT+CSODCP - Sending of Originating Data Via the Control Plane

The set command is used by the TE to transmit data over control plane to network via MT. Context identifier <cid> is used to link the data to particular context.

SIM Presence	Setting saved	Can be aborted
Required	No	No




AT+CSODCP=<cid>,<cpdataLength>,<cpdata>,<RAI>[,<typeOfUserData>]

Parameters:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands)
<cpdataLength>	integer	-	indicates the number of octets of the <cpdata> information element. When there is no data to transmit, the value shall be set to zero.
<cpdata>	string	-	is a string of octets. Contains the user data container contents. When there is no data to transmit, the <cpdata> shall be an empty string (""). This parameter shall not be subject to conventional character conversion as per +CSCS. The coding format of the user data container and the maximum length of <cpdata> are implementation specific.
<RAI>	integer	0	indicates the value of the release assistance indication
Values:			



	<div>0 : no information available</div> <div>1 : the MT expects that exchange of data will be completed with the transmission of the ESM DATA TRANSPORT message</div> <div>2 : the MT expects that exchange of data will be completed with the receipt of an ESM DATA TRANSPORT Message</div> <div>.....</div>		
<typeOfUserData>	integer 0	indicates whether the user data that is transmitted is regular or exceptional	
<div>Values:</div> <div>.....</div> <div>0 : regular data</div> <div>1 : exception data</div> <div>.....</div>			



AT+CSODCP=?

Test command reports the supported range of values for parameters: <cid>, <cpdataLength>, <RAI> and <typeOfUserData>.



## AT+CRTDCP - Reporting of Terminating Data Via the Control Plane

The set command is used to enable and disable reporting of data from the network to the MT that is transmitted via the control plane in downlink direction.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT+CRTDCP=[<reporting>]

If reporting is enabled, the MT returns the following unsolicited result code when data is received from the network.

+CRTDCP: <cid>,<cpdataLength>,<cpdata>



Parameter:

Name	Type	Default	Description
<reporting>	integer	0	controlling reporting of mobile terminated control plane data events
Values:			
0 : disable reporting of MT control plane data			
1 : enable reporting of MT control plane data by the unsolicited result code +CRTDCP			

Unsolicited fields:

Name	Type	Description
<cid>	integer	specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands)
<cpdataLength>	integer	indicates the number of octets of the <cpdata> information element



	<code>&lt;cpdata&gt;</code>	string	is a string of octets. Contains the user data container contents. This parameter shall not be subject to conventional character conversion as per +CSCS. The coding format of the user data container and the maximum length of <code>&lt;cpdata&gt;</code> are implementation specific
	<b>AT+CRTDCP?</b> Read command returns the current parameter setting for +CRTDCP command in the format: +CRTDCP: <code>&lt;reporting&gt;</code>		
	<b>AT+CRTDCP=?</b> Test command reports the supported range of values for parameter <code>&lt;reporting&gt;</code> , and range of supported <code>&lt;cid&gt;</code> and <code>&lt;cpdataLength&gt;</code> .		



# IPEasy



## AT#SGACT - Context Activation

This command enables/disables the PDP context activation.

SIM Presence	Setting saved	Can be aborted
Required	No	Yes



**AT#SGACT=<cid>,<stat>[,<userId>[,<pwd>]]**

Execution command is used to activate the specified PDP context, followed by binding data application to the PS network. Also, it is used to deactivate the PDP context and unbind data application from PS network.

Execution command returns a list of IP addresses for the specified context identifiers in the format:

for IP or IPV6 PDP context: **#SGACT: <ipAddr>**

for DUAL STACK IPV4V6 PDP context: **#SGACT: [<ipAddrV4>],[<ipAddrV6>]**

Parameters:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context definition. To know the range see +CGDCONT command.
<stat>	integer	0	activates/disactivates the PDP context specified
Values:			
.....			
0	:	deactivate the context	
1	:	activate the context	
.....			





<userId>	string	-	user identifier, used only if the context requires it
<pwd>	string	-	password, used only if the context requires it

Additional info:

►► Meaning of the parameters returned by the command.

Name	Type	Default	Description
<ipAddr>	string	-	ip address ipv4 or ipv6
<ipAddrV4>	string	-	ip address ipv4 (if v4 PDP context activated)
<ipAddrV6>	string	-	ip address ipv6 (if v6 PDP context activated)

- ✚ Context activation/deactivation returns ERROR if there is not any socket associated to it, see #SCFG.
- ✚ In LTE network, default PDP context (<cid>=1) is activated by piggybacking on LTE attach procedure and maintained until detached from network. This command with <cid>=1 is just binding or unbinding application to the default PDP context.
- ✚ If the unsolicited result code for obtaining IP address was enabled (urcmode value) using #SGACTCFG command, on start up and due to USB enumeration timing the unsolicited may not appear, user should manually use +CGPADDR command to see the IP address.
- ✚ #SCFG=x,0 will close all unclosed AT#SD sockets on <cid>=x.



AT#SGACT?



Read command returns the state of all the contexts that have been defined in the format:

```
#SGACT: <cid1>,<stat1><CR><LF>
```

...

```
#SGACT: <cidn>,<statn>
```



Each row in the read command's answer is optional.



AT#SGACT=?

Test command reports the range for the parameters <cid> and <stat>.



## AT#SGACTAUTH - PDP Context Authentication Type

This command sets the authentication type for IP Easy

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#SGACTAUTH=<type>

Set command sets the authentication type for IP Easy, it has effect on the authentication mode used by #SGACT command.

Parameter:

Name	Type	Default	Description
<type>	integer	1	authentication type for IP Easy
Values:			
0	:	no authentication	
1	:	PAP authentication	
2	:	CHAP authentication	



### AT#SGACTAUTH?

Read command reports the current IP Easy authentication type, in the format:

#SGACTAUTH: <type>



### AT#SGACTAUTH=?

Test command returns the supported values for parameter <type>.



## AT#SGACTCFG - PDP Automatic Context Activation-Reactivation

This command configures the automatic activation/reactivation of the specified PDP context

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#SGACTCFG=<cid>,<retry>[,<delay>[,<urcmode>]]**

Set command enables/disables the automatic activation/reactivation of the specified PDP context, sets the maximum number of attempts and the delay between an attempt and the next one. The context is automatically activated after every PS attach or after a network PDP context deactivation if at least one IPEasy socket is configured for that context, see #SCFG command.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identifier. To know the range see +CGDCONT command.
<retry>	integer	0	specifies the maximum number of context activation attempts in case of activation failure. 0 disables the automatic activation/reactivation of the context. It is the default value if the set command is not used, see Example section.
Value:			
<div> <div>1÷15</div> <div>:</div> <div>number of attempts.</div> </div>			
<delay>	integer	180	specifies the delay in seconds between an attempt and the next one.



180 is the default value if the set command is not used, see Example section.		
Value:		
.....	180÷3600	: delay in seconds
.....		
<urcmode>	integer 0	URC presentation mode.
Values:		
.....	0	: disables URC
.....	1	: enables URC, see Additional info section.
.....		

Additional info:




►► <urcmode>=1  
enables the URC after an automatic activation/reactivation of the local IP address obtained from the network. It has meaning only if <retry>≠0.  
The format of the URC message is:

#SGACT: <ip\_address>

Unsolicited field:

Name	Type	Description
<ip_address>	string	local IP address obtained from the network.



-  The URC presentation mode <urcmode> is related to the current AT instance only. Last <urcmode> setting is saved for every instance as extended profile parameter, thus it is possible to restore it even if the multiplexer control channel is released and set up, back and forth.
-  < retry > and <delay> setting are global parameters saved in NVM.
-  If the automatic activation is enabled on a context, then it is not allowed to modify by the command #SCFG the association between the context itself and the socket connection identifier; all the other parameters of command #SCFG are modifiable while the socket is not connected.



### AT#SGACTCFG?

Read command reports the states of all configured PDP contexts, in the format:

```
#SGACTCFG: <cid1>,<retry1>,<delay1>, < urcmode >CR><LF>
```

...

```
#SGACTCFG: <cidn>,<retryn>,<delayn>,< urcmode >
```



### AT#SGACTCFG=?

Test command reports the values ranges of the parameters.



- AT+CGDCONT=1,"IP","Access\_Point\_Name"  
OK  
  
AT+CGDCONT?  
+CGDCONT: 1,"IP","Access\_Point\_Name","",0,0  
OK  
  
AT#SCFG=6,1,300,90,600,50  
OK



```
AT#SCFG?  
#SCFG: 1,1,300,90,600,50  
#SCFG: 2,1,300,90,600,50  
#SCFG: 3,1,300,90,600,50  
#SCFG: 4,2,300,90,600,50  
#SCFG: 5,2,300,90,600,50  
#SCFG: 6,1,300,90,600,50  
OK
```

```
AT#SGACTCFG?  
#SGACTCFG: 1,0,180,0  
OK
```

```
AT#SGACTCFG=1,15,3600,1  
OK
```

```
AT#SGACTCFG?  
#SGACTCFG: 1,15,3600,1  
OK
```

Reboot the module

```
AT#SGACTCFG?  
#SGACTCFG: 1,15,3600,0  
OK
```



## AT#SGACTCFGEXT - Extended PDP Context Configuration

This command manages the extended configuration of context activation.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No

AT#SGACTCFGEXT=<cid>,<abortAttemptEnable>[,<closureEnable>[,<unused>[,<unused>]]]

Set command is used to enable new features related to context activation.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identifier. To know the range see +CGDCONT command.
<abortAttemptEnable>	integer	0	enables/disables abort during context activation attempt.
Values: <div> <div>0 : old behavior: no abort possible while attempting context activation</div> <div>1 : abort during context activation attempt is possible by sending a byte on the serial port</div> </div>			
<closureEnable>	integer	0	enable/disable socket closure during context activation
Value: <div> <div>0 : if a socket is using the &lt;cid&gt;, an AT#SGACT on this &lt;cid&gt; returns error</div> </div>			





	1	:	if a socket is using the <cid>, an AT#SGACT on this <cid> leads to the socket closure
<unused>	mixed	N/A	unused parameter
	Value:		
	0	:	dummy value
<unused>	mixed	N/A	unused parameter
	Value:		
	0	:	dummy value

- ✦ <abortAttemptEnable>=1 takes effect on successive PDP context activation attempt through #SGACT command. While waiting for AT#SGACT=<cid>,1 response, it is possible to abort attempt by sending a byte and get back AT interface control (NO CARRIER indication).
- ✦ If we receive delayed CTXT ACTIVATION ACCEPT after abort, network will be automatically informed of our aborted attempt through relative protocol messages (SM STATUS) and will also close on its side. Otherwise, if no ACCEPT is received after abort, network will be informed later of our PDP state through other protocol messages (routing area update for instance).
- ✦ The command is not effective while the context is already open.

## AT#SGACTCFGEXT?

Read command reports the state of all the five contexts, in the format:



```
#SGACTCFGEXT: <cid1>,<abortAttemptEnable1>,<closureEnable1>,0,0<CR><LF>
```

```
...
```

```
#SGACTCFGEXT: <cidn>,<abortAttemptEnablen>,<closureEnablen>,0,0<CR><LF>
```

```
AT#SGACTCFGEXT=?
```

Test command reports supported range of values for all parameters.



See #SGACTCFG command

```
AT#SGACTCFG?
```

```
#SGACTCFG: 1,15,3600,0
```

```
OK
```

```
AT#SGACTCFGEXT?
```

```
#SGACTCFGEXT: 1,0,0,0,0
```

```
OK
```

```
AT#SGACTCFGEXT=1,1,0,0,0
```

```
OK
```

```
AT#SGACTCFGEXT?
```

```
#SGACTCFGEXT: 1,1,0,0,0
```

```
OK
```

Reboot the module

```
AT#SGACTCFGEXT?
```

```
#SGACTCFGEXT: 1,1,0,0,0
```

```
OK
```



## AT#SCFG - Socket Configuration

The command sets the configuration for the socket.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>

Set command sets the socket configuration parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier.
Value: <div> <div>1÷conMax</div> <div>:</div> <div>Socket connection identifier value; conMax value is returned by test command</div> </div>			
<cid>	integer	-	PDP context identifier. To know the range see +CGDCONT command.
<pktSz>	integer	300	Packet size in bytes to be used by the TCP/UDP/IP stack for data sending.
Values: <div> <div>0</div> <div>:</div> <div>select automatically default value</div> </div> <div> <div>1÷1500</div> <div>:</div> <div>packet size in bytes</div> </div>			



<maxTo>	integer	90	Exchange timeout in seconds (or socket inactivity timeout); if there's no data exchange within this timeout period the connection is closed.
Values: ..... 0 : no timeout 1÷65535 : timeout .....			
<connTo>	integer	600	Connection timeout in tenths of seconds. If we cannot establish a connection to the remote within this timeout period, an error is raised.
Values: ..... 0 : no timeout 10÷1200 : timeout value in hundreds of milliseconds .....			
<txTo>	integer	50	data sending timeout; data are sent even if they are less than max packet size, after this period. Used for online data mode only.
Values: ..... 0 : no timeout 1÷255 : timeout in tenths of seconds 256 : timeout value of 10 ms 257 : timeout value of 20 ms			



```

258      : timeout value of 30 ms

259      : timeout value of 40 ms

260      : timeout value of 50 ms

261      : timeout value of 60 ms

262      : timeout value of 70 ms

263      : timeout value of 80 ms

264      : timeout value of 90 ms

```



#### AT#SCFG?

Read command returns the current socket configuration parameters values for all the sockets, in the format:

```

#SCFG: <connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1><CR><LF>
#SCFG: <connId2>,<cid2>,<pktsz2>,<maxTo2>,<connTo2>,<txTo2><CR><LF>
...
#SCFG: <connIdconMax>,<cidconMax>,<pktszconMax>,<maxToconMax>,<connToconMax>,<txToconMax>

```



#### AT#SCFG=?

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



#### Example of read command.

- AT#SCFG?  
#SCFG: 1,1,300,90,600,50  
#SCFG: 2,2,300,90,600,50  
#SCFG: 3,2,250,90,600,50  
#SCFG: 4,1,300,90,600,50  
#SCFG: 5,1,300,90,600,50



#SCFG: 6,1,300,90,600,50  
OK



# AT#SCFGEXT - Socket Configuration Extended

This command sets the socket configuration extended parameters.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SCFGEXT=<connId>,<srMode>,<recvDataMode>,<keepalive>[,<ListenAutoRsp>[,<sendDataMode>]]

Set command sets the socket configuration extended parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	1	socket connection identifier
Value: <div> 1÷conMax : socket connection identifier. conMax value is returned by test command </div>			
<srMode>	integer	0	SRING unsolicited mode, see Additional info section.
Values: <div> 0 : Normal   1 : Data amount   2 : Data view   3 : Data view with UDP datagram information </div>			



<recvDataMode>	integer 0	Data view mode for received data in command mode (#SRECV or <srMode> = 2)
Values:		
0	: Text mode	
1	: Hexadecimal mode	
<keepalive>	integer 0	Set the number of minutes a connection needs to be idle before TCP begins sending out keep-alive probes
Values:		
0	: deactivated	
1÷240	: keepalive time in minutes	
<ListenAutoRsp>	integer 0	set the listen auto-response mode, that affects the commands #SL and #SLUDP
Values:		
0	: deactivated	
1	: activated	
<sendDataMode>	integer 0	Data mode for sending data in command mode (#SSEND)





#### Values:

- .....
- 0 : data represented as text
- 1 : Data represented as sequence of hexadecimal numbers (from 00 to FF). Each octet of the data is given as two IRA character long.
- .....

#### Additional info:

►► These are the SRING formats, depending on <srMode> setting:

if <srMode> = 0 (Normal):

SRING: <connId>

if <srMode> = 1 (Data amount):

SRING: <connId>,<recData>

if <srMode> = 2 (Data view):

SRING: <connId>,<recData>,<data>

if <srMode> = 3 (Data view with UDP datagram information):

SRING: <sourceIP>,<sourcePort>,<connId>,<recData>,<dataLeft>,<data>

Name	Type	Default	Description
<recData>	integer	-	amount of data received on the socket connection number <connId>
<data>	mixed	-	data received displayed following <recvDataMode> value



<sourceIP>	string	-	IP address of the source of data
<sourcePort>	string	-	IP port of the source of data
<dataLeft>	integer	-	number of bytes left in the UDP datagram



Keepalive is available only on TCP connections.



For the behavior of #SL and #SLUDP in case of auto response mode or in case of no auto response mode, see the description of the two commands.



#### AT#SCFGEXT?

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

```
#SCFGEXT: <connId1>,  
<srMode>,<dataMode>,<keepalive>,<ListenAutoRsp>,0<CR><LF>
```

...

```
#SCFGEXT:<connIdconMax>,<srMode>,<dataMode>,<keepalive>,  
<ListenAutoRsp>,0<CR><LF>
```



#### AT#SCFGEXT=?

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



- Socket 1 set with data view string, text data mode, a keepalive time of 30 minutes and listen auto-response set.



Socket 3 set with data amount string, hex recv data mode, no keepalive and listen auto-response not set.

Socket 4 set with hex recv and send data mode.

AT#SCFGEXT?

#SCFGEXT: 1,2,0,30,1,0

#SCFGEXT: 2,0,0,0,0,0

#SCFGEXT: 3,1,1,0,0,0

#SCFGEXT: 4,0,1,0,0,1

...

...

OK



## AT#SCFGEXT2 - Socket Configuration Extended 2

Socket Configuration Extended.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No

AT#SCFGEXT2=<connId>,<bufferStart>[,<abortConnAttempt>[,<newSrtingMode>[,<unused\_C>[,<noCarrierMode>]]]]

Set command sets the socket configuration extended parameters for features not included in #SCFGEXT command.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value: <div> 1÷max : socket connection identifier value (max value is returned by the Test command) </div>			
<bufferStart>	integer	0	select one of the two data sending timeout methods, the first one defined "old" the second one "new".  The "old" data sending timeout method is set - by default - by #SCFG command, which sets also the <txTo> data sending timeout value. With #SCFGETXT2 command, you can set either the "old" or the "new" data sending timeout method. If the "new" method is selected, the "old" one is automatically disabled.



<p>The checking if new data have been received from serial port is done with a granularity that is directly related to #SCFG &lt;txTo&gt; setting with a maximum period of 1 sec.</p>	
<p>Values:</p> <p>.....</p> <p>0 : select "old" method: start transmission timer only first time if new data are received from the serial port</p> <p>1 : select "new" method: restart transmission timer when new data is received from serial port</p> <p>.....</p>	
<p>&lt;abortConnAttempt&gt; integer 0 enable the abort of an ongoing connection attempt started by #SD command and before the reception of the CONNECT message (in online mode) or OK message (in command mode).</p> <p>Values automatically saved in NVM.</p>	
<p>Values:</p> <p>.....</p> <p>0 : not possible to interrupt connection attempt</p> <p>1 : it is possible to interrupt the connection attempt (&lt;connTo&gt; set by #SCFG or DNS resolution running if required) and give back control to AT interface by reception of a character. As soon as the control given to the AT interface, the ERROR message will be received on the interface itself.</p> <p>.....</p>	







<newSrिंगMode>	integer	N/A	used to select SRING indication handling
Values: ..... 0 : SRING standard indication  1 : SRING indicates only the amount of data on the packet that is at the top of the queue, until all data is read .....			
<unused_C>	integer	-	reserved for future use
<noCarrierMode>	integer	0	select the NO CARRIER message format received when the socket is closed.
Values: ..... 0 : no additional information is attached to NO CARRIER message  1 : NO CARRIER: <connId> message  2 : NO CARRIER: <connId>, <cause> message. Refer to Additional info section .....			

#### Additional info:

- <noCarrierMode>=2 selects the following NO CARRIER message format:  
 NO CARRIER: <connId>, <cause>



Name	Type	Default	Description
<cause>	integer	-	is the socket disconnection cause. Refer to #SLASTCLOSURE command to know its values and meanings.

-  It is necessary to avoid overlapping of the two methods. Enabling new method, the old method for transmission timer (#SCFG) is automatically disabled to avoid overlapping.
-  Check if new data have been received from serial port is done with a granularity directly related to <txTo> parameter which is set by #SCFG command. The maximum period is 1 sec.
-  Like #SLASTCLOSURE, in case of subsequent consecutive closure causes received, the original disconnection cause indicated.
-  In the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data (#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.

#### AT#SCFGEXT2?

Read command returns the current socket extended configuration of the six sockets. The format is:

```
#SCFGEXT2:<connId1>,<bufferStart1>,<abortConnAttempt1>,<newSringMode1>,0,
<noCarrierMode1><CR><LF>
...
#SCFGEXT2:<connId6>,<bufferStart6>,<abortConnAttempt6>,<newSringMode6>,0,
<noCarrierMode6><CR><LF>
```

#### AT#SCFGEXT2=?

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



&lt;/&gt;

- Set the new transmission timer behavior for <connId>=1 and <connId>=2 sockets.

```
AT#SCFGEXT2=1,1
```

```
OK
```

```
AT#SCFGEXT2=2,1
```

```
OK
```

Check the current extended configuration of the six sockets

```
AT#SCFGEXT2?
```

```
#SCFGEXT2: 1,1,0,0,0,0
```

```
#SCFGEXT2: 2,1,0,0,0,0
```

```
#SCFGEXT2: 3,0,0,0,0,0
```

```
#SCFGEXT2: 4,0,0,0,0,0
```

```
#SCFGEXT2: 5,0,0,0,0,0
```

```
#SCFGEXT2: 6,0,0,0,0,0
```

```
OK
```

Check the current configuration of the six sockets

```
AT#SCFG?
```

```
#SCFG: 1,1,300,90,600,50
```

```
#SCFG: 2,1,300,90,600,50
```

```
#SCFG: 3,1,300,90,600,50
```

```
#SCFG: 4,2,300,90,600,50
```

```
#SCFG: 5,2,300,90,600,50
```

```
#SCFG: 6,2,300,90,600,50
```

```
OK
```

Change the <txTo> data sending timeout of the <connId>=1 socket.

```
AT#SCFG=1,1,300,90,600,30
```

```
OK
```





## AT#SKTRST - Socket Parameters Reset

Socket Parameters Reset

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#SKTRST**

Execution command resets the #SCFG socket parameters to the "factory default" configuration and stores them in the NVM of the device.



**AT#SKTRST=?**

Test command returns the OK result code.



Reset of the socket parameters

```
AT#SKTRST
OK
```



## AT#SD - Socket Dial

Execution command opens a remote connection via socket.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>[,<closureType>[,<IPort>[,<connMode>[,<txTime>[,<userIpType>]]]]]

Execution command opens a remote connection via socket.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier.
Value:			
1÷max : socket connection identifier value (max value is returned by the Test command)			
<txProt>	integer	N/A	Transmission protocol.
Values:			
0 : TCP			
1 : UDP			
<rPort>	integer	N/A	Remote host port to contact.
Value:			



		<div> <div>1÷65535</div> <div>:</div> <div>remote host port number</div> </div>	
<IPAddr>	string -	IP address of the remote host: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query - any valid IPv6 address in the format: xxx:xxx:xxx:xxx:xxx:xxx:xxx:xxx or xxx.xxx.xxx.xxx.xxx.xxx.xxx. xxx.xxx.xxx.xxx.xxx.xxx.xxx	
<closureType>	integer 0	Socket closure behavior only for TCP when remote host has closed. The parameter has no effects for UDP connections.	
		Values: <div> <div>0</div> <div>:</div> <div>local host closes immediately when remote host has closed</div> </div> <div> <div>255</div> <div>:</div> <div>local host closes after an escape sequence (+++)</div> </div>	
<IPort>	integer N/A	UDP connections local port only for UDP connections. The parameter has no effects for TCP connections.	
		Value: <div> <div>1÷65535</div> <div>:</div> <div>UDP local port number</div> </div>	



<connMode>	integer 0	Connection mode.
Values: ..... 0 : online mode connection ..... 1 : command mode connection .....		
<txTime>	integer 0	adjusting a time interval for series of UDP data packets will be uploaded.
Values: ..... 0 : Time interval is not requested ..... 1÷1000 : Time interval in milliseconds .....		
<userIpType>	integer 0	ip type for socket to open
Values: ..... 0 : no ip type chosen ..... 1 : ipv4 ..... 2 : ipv6 .....		



<userIpType> parameter is only valid when <IPAddr> is domain name and dual stack connection is open by #SGACT.



When <userIpType> is "no ip type chosen" ipv6 will be requested firstly.  
When ipv6 DNS server does not support so ipv4 will be requested.



<closureType> parameter is valid for TCP connections only and has no effect (if used) for UDP connections.



<lPort> parameter is valid for UDP connections only and has no effect (if used) for TCP connections



If we set <connMode> to online mode connection and the command is successful we enter in online data mode and we see the intermediate result code CONNECT. After the CONNECT we can suspend the direct interface to the socket connection (N.B. the socket stays open) using the escape sequence (+++): the module moves back to command mode and we receive the final result code OK after the suspension.

After such a suspension, it is possible to resume it in every moment (unless the socket inactivity timer timeouts, see #SCFG) by using the #SO command with the corresponding <connId>.



If we set <connMode> to command mode connection and the command is successful, the socket is opened, and we remain in command mode and we see the result code OK.



If there are input data arrived through a connected socket and not yet read because the module entered command mode before reading them (after an escape sequence or after #SD has been issued with <connMode> set to command mode connection), these data are buffered and we receive the SRING URC (SRING presentation format depends on the last #SCFGEXT setting); it is possible to read these data afterwards issuing #SRECV. Under the same hypotheses it is possible to send data while in command mode issuing #SEND.



<txTime> parameter is valid for UDP connections only and has no effect (if used) for TCP connections. For slow servers it is recommended to adjust the time interval for uploading series of data packets in order to do not lose data. The following data packet will be sent after the previous data packet's time interval has been expired.



AT#SD=?

Test command reports the range of values for all the parameters.





Examples of socket dial in online and command mode.

- Open socket 1 in online mode  
AT#SD=1,0,80,"www.google.com",0,0,0  
  
CONNECT  
...  
...  
Open socket 1 in command mode  
AT#SD=1,0,80,"www.google.com",0,0,1  
OK



## AT#SO - Socket Restore

Execution command resumes the direct interface to a socket connection which has been suspended by the escape sequence.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SO=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
<div> <div>1÷conMax</div> <div>:</div> <div>socket connection identifier. conMax value is returned by test command</div> </div>			



AT#SO=?

Test command reports the range of values for <connId> parameter



## AT#SH - Socket Shutdown

The set command closes a socket.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#SH=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier to be closed
<p>Value:</p> <p>.....</p> <p>1÷conMax : socket connection identifier. conMax value is returned by test command</p> <p>.....</p>			



Socket cannot be closed in states "resolving DNS" and "connecting", see #SS command.



AT#SH=?

Test command reports the range for parameter <connId>





## AT#SL - Socket Listen

This command opens/closes socket listening.

SIM Presence	Setting saved	Can be aborted
Required	No	No






**AT#SL=<connId>,<listenState>[,<listenPort>[,<lingerT>]]**

Set command opens/closes a socket listening for an incoming TCP connection on a specified port.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
<div> <div>1÷6</div> <div>:</div> <div>socket connection identifier</div> </div>			
<listenState>	integer	N/A	listening action
Values:			
<div> <div>0</div> <div>:</div> <div>close socket listening</div> </div>			
<div> <div>1</div> <div>:</div> <div>start socket listening</div> </div>			
<listenPort>	integer	N/A	local listening port; mandatory only if <listenState> is 1
Value:			



	<div> <div>1÷65535 : local listening port value</div> <div>&lt;lingerT&gt; integer N/A linger time</div> <div> Values: <div> 0 : immediate closure after remote closure</div> <div>255 : local host closes only after an escape sequence (+++)</div> </div> </div>
	<p> If successful, command returns a final result code OK. If the ListenAutoRsp flag has not been set through the command #SCFGEXT (for the specific &lt;connId&gt;), then, when a TCP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), an URC is received:</p> <p>+SRING : &lt;connId&gt;</p> <p>Afterwards we can use #SA to accept the connection or #SH to refuse it.</p> <p>If the ListenAutoRsp flag has been set, then, when a TCP connection request comes on the input port, if the sender is not filtered by the internal firewall (see #FRWL), the connection is automatically accepted: the CONNECT indication is given and the modem goes into online data mode.</p> <p>If the socket is closed by the network the following URC is received:</p> <p>#SKTL: ABORTED</p>
	<p>AT#SL?</p> <p>Read command returns all the actual listening TCP sockets.</p>
	<p>AT#SL=?</p>



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



Open a socket listening for TCP on port 3500.

```
AT#SL=1,1,3500
```

```
OK
```



## AT#SLUDP - Socket Listen UDP

This command opens/closes a socket listening for an incoming UDP connection on a specified port.

SIM Presence	Setting saved	Can be aborted
Required	Other	No



AT#SLUDP=<connId>,<listenState>[,<listenPort>]

Execution command opens/closes a socket listening for an incoming UDP connection on a specified port.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:  1÷conMax : socket connection identifier. conMax value is returned by test command			
<listenState>	integer	0	indicates the action that will be performed
Values:  0 : closes socket listening  1 : starts socket listening			
<listenPort>	integer	1	local listening port; mandatory only if <listenState> is 1



Value:

1÷65535 : available port numbers

✦ If the ListenAutoRsp flag has not been set through the command #SCFGEXT (for the specific connId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall (see #FRWL), an URC is received:

+SRING : <connId>

Afterwards we can use #SA to accept the connection or #SH to refuse it.

If the ListenAutoRsp flag has been set, then, when an UDP connection request comes on the input port, if the sender is not filtered by the internal firewall (see command #FRWL), the connection is automatically accepted: the CONNECT indication is given and the modem goes into online data mode.

If the socket is closed by the network the following URC is received:

#SLUDP: ABORTED

✦ When closing the listening socket <listenPort> is a do not care parameter.



AT#SLUDP?

Read command returns all the actual listening UDP sockets.



AT#SLUDP=?

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





Next command opens a socket listening for UDP on port 3500.

```
AT#SLUDP=1,1,3500
```

```
OK
```



## AT#SA - Socket Accept

Execution command accepts an incoming socket connection.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#SA=<connId>[,<connMode>]

Execution command accepts an incoming socket connection after an URC

SRING: <connId>

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier.
Value:  1÷max : Socket connection identifier value (max is returned by the Test command)			
<connMode>	integer	0	Connection mode, as for command #SD.
Values:  0 : online mode connection  1 : command mode connection			





The SRING URC has to be a consequence of a #SL issue.



Setting the command before to having received a SRING will result in an ERROR indication, giving the information that a connection request has not yet been received.



AT#SA=?

Test command reports the range of values for all the parameters.





## AT#SSEND - Send Data in Command Mode

This command is used to send data through a connected socket.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#SSEND=<connId>[,<Rai>]**

Execution command permits, while the module is in command mode, to send data through a connected socket.

After entering AT#SSEND=... command, and terminated the command line with <CR>, the module returns the following four characters sequence prompt, and waits for data to send:

<CR><LF><greater\_than><space> (see IRA character set: 13, 10, 62, 32)

To send the entered data, enter Ctrl-Z char (0x1A hex); to abort the operation enter ESC char (0x1B hex).

If data are successfully sent, the command returns OK. If data sending fails for some reason, an error code is reported.





Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Selection on which Socket connection identifier send data.
Value: ..... 1÷10 : Socket connection identifier supported .....			
<Rai>	integer	1	RAI (Release Assistance Indication) configuration



#### Values:

- 1 : Set RAI to: "No further uplink or downlink data transmission subsequent to this transmission"
- 2 : Set RAI to: "Only a single downlink data transmission and no further uplink data transmissions subsequent to this transmission"

-  The maximum number of bytes to send is 1500 bytes; trying to send more data will cause the surplus to be discarded and lost.
-  It is possible to use #SSEND only if the connection was opened by #SD, else the ME is raising an error.
-  A byte corresponding to BS char (0x08) is treated with its corresponding meaning; therefore previous byte will be cancelled (and BS char itself will not be sent).
-  RAI (Release Assistance Indication) is supported in NB-IoT only, otherwise is ignored.



AT#SSEND=?

Test command returns the range of supported values for parameter <connId> and <Rai>.



```
Send data through socket number 2
AT#SSEND=2
>Test<CTRL-Z>
OK
```



## AT#SSENDEXT - Send Data in Command Mode extended

This command allows to send data through a connected socket including all possible octets (from 0x00 to 0xFF).

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#SSENDEXT=<connId>,<bytesToSend>[,<Rai>]**

Execution command permits, while the module is in command mode, to send data through a connected socket including all possible octets (from 0x00 to 0xFF).

After entering AT#SSENDEXT=... command, and terminated the command line with <CR>, the module returns the following four characters sequence prompt, and waits for data to send:

<CR><LF><greater\_than><space> (see IRA character set: 13, 10, 62, 32)

When <bytesToSend> bytes have been sent, operation is automatically completed.


If data are successfully sent, the command returns OK. If data sending fails for some reason, an error code is reported.

Parameters:


Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value: <div> <div>1÷10</div> <div>:</div> <div>socket connection identifier</div> </div>			
<bytesToSend>	integer	N/A	number of bytes to be sent
Value:			




<div>1÷maxBytes : maxBytes is the maximum number of bytes that can be sent and it is reported by the test command</div> <div></div>			
<Rai>	integer	N/A	RAI (Release Assistance Indication) configuration
<div>Values:</div> <div></div> <div>1 : Set RAI to: "No further uplink or downlink data transmission subsequent to this transmission"</div> <div>2 : Set RAI to: "Only a single downlink data transmission and no further uplink data transmissions subsequent to this transmission"</div> <div></div>			




It's possible to use #SSENDEXT only if the connection was opened by #SD, else the modem returns an error.



All special characters are sent like a generic byte. For example, 0x08 is not interpreted as a BS (BackSpace) but it is simply sent through the socket.



RAI (Release Assistance Indication) is supported in NB-IoT only, otherwise is ignored.



AT#SSENDEXT=?  
Test command returns the range of supported values for parameters <connId>, <bytesToSend> and <Rai>.





Open the socket in command mode:

```
AT#SD=1,0,<port>,"IP address",0,0,1  
OK
```

Enter the command specifying total number of bytes as second parameter:

```
AT#SSENDEXT=1,256
```

```
> ..... ;      Terminal echo of bytes sent is displayed here  
OK
```

All possible bytes (from 0x00 to 0xFF) are sent on the socket as generic bytes.



## AT#SRECV - Socket Receive Data in Command Mode

The command permits the user to read data arrived through a connected socket when the module is in command mode.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#SRECV=<connId>,<maxByte>[,<UDPInfo>]**

Execution command permits the user to read data arrived through a connected socket but buffered and not yet read because the module entered command mode before reading them; the module is notified of these data by a SRING: URC, whose presentation format depends on the last #SCFGEXT setting.

Parameters:

Name	Type	Default	Description
<connId>	integer	NA	socket connection identifier
Value:			
1÷conMax : socket connection identifier. conMax value is returned by test command			
<maxByte>	integer	NA	max number of bytes to read
Value:			
1÷1500 : max number of bytes to read			
<UDPInfo>	integer	0	enables/disables the visualization of UDP datagram information.
Values:			
0 : UDP information disabled			



1 : UDP information enabled, see Additional info section.

Additional info:

►► If <UDPIInfo> is set to 1 (AT#SRECV=<connId>,<maxBytes>,1), the command returns a message having the following format:

#SRECV: <remoteIP>,<remotePort><connId>,<recData>,<dataLeft>

Name	Type	Default	Description
<remoteIP>	string	-	remote ip address
<remotePort>	string	-	remote port address
<recData>	integer	-	received data
<dataLeft>	integer	-	remaining bytes in the datagram.

✚ Issuing #SRECV when there is no buffered data raises an error.



AT#SRECV=?

Test command returns the range of supported values for parameters <connId> <maxByte> and <UDPIInfo>.



## AT#SSENDUDP - Send UDP Data to a Specific Remote Host

This command allows to send data over UDP to a specific remote host.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#SSENDUDP=<connId>,<remoteIP>,<remotePort>[,<Rai>]**

This command allows, while the module is in command mode, to send data over UDP to a specific remote host. UDP connection has to be previously completed with a first remote host through #SLUDP / #SA. Then, if module receives data from this or another host, it is able to send data to it. Like command #SSEND, the device responds with ">" prompt and waits for the data to send.

Parameters:

Name	Type	Default	Description
<connId>	integer	1	socket connection identifier
Value: ..... 1÷10 : identifier number .....			
<remoteIP>	string	-	IP address of the remote host in dotted decimal notation, string type: "xxx.xxx.xxx.xxx"
<remotePort>	integer	1	remote host port
Value: ..... 1÷65535 : host port number .....			








<Rai>	integer	N/A	RAI (Release Assistance Indication) configuration
-------	---------	-----	---

Values:

- 1 : Set RAI to: "No further uplink or downlink data transmission subsequent to this transmission"
- 2 : Set RAI to: "Only a single downlink data transmission and no further uplink data transmissions subsequent to this transmission"

-  After SRING that indicates incoming UDP data and issuing #SRECV to receive data itself, through #SS is possible to check last remote host (IP/Port).
-  If successive resume of the socket to online mode is performed (#SO), connection with first remote host is restored as it was before.
-  RAI (Release Assistance Indication) is supported in NB-IoT only, otherwise is ignored.



AT#SENDUDP=?

Test command reports the supported range of values for parameters <connId>, <remoteIP> and <remotePort> and <Rai>.



- Starts listening on <LocPort> (previous setting of firewall through #FRWL has to be done)  
AT#SLUDP=1,1,<LocPort>  
OK



SRING: 1                    UDP data from a remote host available

AT#SA=1,1  
OK

SRING: 1

AT#SI=1  
#SI: 1,0,0,23,0        23 bytes to read  
OK

AT#SRECV=1,23  
#SRECV:1,23  
message from first host  
OK

AT#SS=1  
#SS: 1,2,<LocIP>,<LocPort>,<RemIP1>,<RemPort1>  
OK

AT#SENDUDP=1,<RemIP1>,<RemPort1>  
>response to first host  
OK

SRING: 1                    UDP data from a remote host available

AT#SI=1  
#SI: 1,22,23,24,0     24 bytes to read  
OK

AT#SRECV=1,24  
#SRECV:1,24  
message from second host  
OK

AT#SS=1  
#SS: 1,2,<LocIP>,<LocPort>,<RemIP2>,<RemPort2>  
OK



Remote host has changed, we want to send a response:

AT#SENDUDP=1,<RemIP2>,<RemPort2>

>response to second host

OK



## AT#SSENDUDPEXT - Send UDP Data to a Specific Remote Host EXTENDED

This command permits, while the module is in command mode, to send data over UDP to a specific remote host including all possible octets (from 0x00 to 0xFF)

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



AT#SSENDUDPEXT=<connId>,<bytestosend>,<remoteIP>,<remotePort>[,<Rai>]

Set command permits, while the module is in command mode, to send data over UDP to a specific remote host including all possible octets (from 0x00 to 0xFF).

As indicated about #SSENDUDP, UDP socket has to be previously opened through #SLUDP / #SA, then we are able to send data to different remote hosts.

Like #SSENDEXT, the device responds with the prompt '>' and waits for the data to send, operation is automatically completed when <bytestosend> have been sent.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
.....			
1÷10 : identifier number			
.....			
<bytestosend>	integer	N/A	bytes to be sent
Value:			
.....			
1÷1500 : number of bytes to be sent			
.....			



<remoteIP>	string	-	IP address of the remote host in dotted decimal notation ("xxx.xxx.xxx.xxx")
<remotePort>	integer	N/A	remote host port
Value: <div> 1÷65535 : host port number </div>			
<Rai>	integer	N/A	RAI (Release Assistance Indication) configuration
Values: <div> 1 : Set RAI to: "No further uplink or downlink data transmission subsequent to this transmission"   2 : Set RAI to: "Only a single downlink data transmission and no further uplink data transmissions subsequent to this transmission" </div>			



RAI (Release Assistance Indication) is supported in NB-IoT only, otherwise is ignored.



AT#SENDUDPEXT=?

Test command reports the supported range of values for parameters <connId>, <bytesosend>, <remoteIP>, <remotePort> and <Rai>.



## AT#SLASTCLOSURE - Detect the Cause of a Socket Disconnection

The command detects the cause of a socket disconnection.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#SLASTCLOSURE=<connId>**

Execution command reports the socket disconnection cause.

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
<p>Value:</p> <p>.....</p> <p>1÷conMax : socket connection identifier. conMax value is returned by test command</p> <p>.....</p>			

Additional info:

- ▶▶ The execution command reports the disconnection cause of the selected socket. The format of the returned message is:




#SLASTCLOSURE: <connId>,<cause>

Name	Type	Default	Description
<cause>	hex	0	socket disconnection cause.



#### Values:

- 
- 0 : not available (socket has not yet been closed)
  
  - 1 : remote host TCP connection close due to FIN/END:  
normal remote disconnection decided by the remote  
application
  
  - 2 : remote host TCP connection close due to RST, all other  
cases in which the socket is aborted without indication  
from peer (for instance because peer doesn't send ack  
after maximum number of retransmissions/peer is no  
more alive). All these cases include all the "FATAL"  
errors after recv or send on the TCP socket (named as  
different from EWOULDBLOCK)
  
  - 3 : socket inactivity timeout
  
  - 4 : network deactivation (PDP context deactivation from  
network)
  
  - 5 : DNS Error
- 

- 
-  Any time socket is re-opened, last disconnection cause is reset. Command report 0 (not available).
  
  -  User closure cause (#SH) is not considered and if a user closure is performed after remote disconnection, remote disconnection cause remains saved and is not overwritten.
  
  -  If more consecutive closure causes are received, the original disconnection cause is saved.  
(For instance: if a TCP FIN is received from remote and later a TCP RST because we continue to send data, FIN cause is saved and not overwritten)



- ✦ Also in case of <closureType> (#SD) set to 255, if the socket has not yet been closed by user after the escape sequence, #SLASTCLOSURE indicates remote disconnection cause if it has been received.
- ✦ In case of UDP, cause 2 indicates abnormal (local) disconnection. Cause 3 and 4 are still possible.  
(Cause 1 is obviously never possible)
- ✦ In case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data (#SRECV or SRING mode 2), it is indicated cause 1 for both possible FIN and RST from remote.



AT#SLASTCLOSURE=?

Test command reports the supported range for parameter <connId>





## AT#SS - Socket Status

Execution command reports the current sockets status.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#SS[=<connId>]

Execution command reports the current sockets status for the selected socket in the format:

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>

If no <connId> is given, it reports the status for all sockets in the format:

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>

[<connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>[...]]

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value: <div>             .....                           1÷conMax : socket connection identifier; conMax value                               is returned by test command                           .....           </div>			

Additional info:

►► Other parameters meaning.

Name	Type	Default	Description
------	------	---------	-------------



<state>	integer	0	actual state of the socket
<p>Values:</p> <p>.....</p> <p>0 : socket closed</p> <p>1 : socket with an active data transfer connection</p> <p>2 : socket suspended</p> <p>3 : socket suspended with pending data</p> <p>4 : socket listening</p> <p>5 : socket with an incoming connection. Waiting for the user accept or shutdown command</p> <p>6 : socket in opening process. The socket is not in Closed state but still not in Active or Suspended or Suspended with pending data state</p> <p>.....</p>			
<locIP>	string	-	IP address associated by the context activation to the socket
<locPort>	integer	-	<p>two meanings:</p> <p>the listening port if we put the socket in listen mode</p> <p>the local port for the connection if we use the socket to connect to a remote machine</p>
<remIP>	string	-	when we are connected to a remote machine this is the remote IP address
<remPort>	string	-	it is the port we are connected to on the remote machine



**AT#SS=?**

Test command reports the range for <connId> parameter.



- Get information about all sockets.

AT#SS

#SS: 1,3,91.80.90.162,61119,88.37.127.146,10510

#SS: 2,4,91.80.90.162,1000

#SS: 3,0

#SS: 4,0

#SS: 5,3,91.80.73.70,61120,88.37.127.146,10509

#SS: 6,0

OK

Socket 1: opened from local IP 91.80.90.162/local port 61119 to remote IP 88.37.127.146/remote port 10510 is suspended with pending data.

Socket 2: listening on local IP 91.80.90.162/local port 1000.

Socket 5: opened from local IP 91.80.73.70/local port 61120 to remote IP 88.37.127.146/remote port 10509 is suspended with pending data.



## AT#SI - Socket Info

This command is used to get socket information.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#SI[=<connId>]**

Execution command returns information about all sockets data traffic.

Parameter:

Name	Type	Default	Description
<connId>	integer	NA	socket connection identifier. Refer to Additional info sections to have information about the use of the <connId> parameter
Value:			
<div>1÷conMax : socket connection identifier. conMax value is returned by test command</div>			

Additional info:

- ▶▶ If the execution command is used with the <connId> socket identifier, it returns data traffic information on the selected socket. The format of the returned message is:

#SI: <connId>,<sent>,<received>,<buff\_in>,<ack\_waiting>

Name	Type	Default	Description
<sent>	integer	-	total amount (in bytes) of data sent since the last time the socket connection identified by <connId> has been opened



<received>	integer	-	total amount (in bytes) of received data since the last time the socket connection identified by <connId> has been opened
<buff_in>	integer	-	total amount (in bytes) of data just arrived through the socket connection identified by <connId> and currently buffered, not yet read
<ack_waiting>	integer	-	total amount (in bytes) of sent and "not yet acknowledged data" since the last time the socket connection identified by <connId> has been opened. The data "not yet acknowledged" are available only for TCP connections.  For UDP connections <ack_waiting> value is always 0.

- If the AT#SI command is used without the <connId> socket identifier, it returns data traffic information on all sockets. For each socket, the format of the returned message is:

#SI: <connId<sub>n</sub>>,<sent<sub>n</sub>>,<received<sub>n</sub>>,<buff\_in<sub>n</sub>>,<ack\_waiting<sub>n</sub>>



AT#SI=?

Test command reports the range of <connId> parameter.



- Get information about data traffic of all sockets.

AT#SI

#SI: 1,123,400,10,50

#SI: 2,0,100,0,0

#SI: 3,589,100,10,100

#SI: 4,0,0,0,0

#SI: 5,0,0,0,0

...

OK



- Assume that sockets 1,2,3 are opened and having some data traffic. To get traffic information only for the socket <connId>=1 enter the following command:

AT#SI=1

#SI: 1,123,400,10,50

OK

Socket <connId>=1 has 123 bytes sent, 400 bytes received, 10 bytes waiting to be read and 50 bytes waiting to be acknowledged from the remote side.



## AT#ST - Socket Type

Socket Type

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#ST[=<connId>]

Set command reports the current type of the socket (TCP/UDP) and its direction (Dialer/Listener)

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value: <div> 1÷conMAX : socket connection identifier. conMax value is returned by test command </div>			

Additional info:

►► The response format is:

#ST: <connId>,<type>,<direction>

Name	Type	Default	Description
<type>	integer	N/A	socket type



Values:

0	:	No socket
1	:	TCP socket
2	:	UDP socket

<direction>	integer	N/A	direction of the socket
-------------	---------	-----	-------------------------

Values:

0	:	None
1	:	Dialer
2	:	Listener

►► Issuing #ST command without <connId> socket identifier, it returns information about type of all sockets. For each socket, the format of the returned message is:

#ST: <connId<sub>n</sub>>,<type<sub>n</sub>>,<direction<sub>n</sub>><CR><LF>



AT#ST=?

Test command reports the range for parameter <connId>.







## Examples for single socket and for all sockets

- For single socket

```
AT#ST=3
```

```
#ST: 3,2,1
```

Socket 3 is an UDP dialer

- for all socket

```
AT#ST
```

```
#ST: 1,0,0
```

```
#ST: 2,0,0
```

```
#ST: 3,2,1
```

```
#ST: 4,2,2
```

```
#ST: 5,1,1
```

...

Socket 1 is closed.

Socket 2 is closed.

Socket 3 is an UDP dialer

Socket 4 is an UDP listener

Socket 5 is a TCP dialer



## AT#PADCMD - PAD Command Features

This command sets features of the pending data flush to socket, opened with #SD command.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#PADCMD=<mode>

Set command for features of the pending data flush to socket, opened with #SD command.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	enable/disable forwarding
Values: <div> <div>0 : Bit 1: disable forwarding</div> <div>1 : Bit 1: enable forwarding</div> </div>			



Forwarding depends on character defined by #PADFWD.



Other bits are reserved.



AT#PADCMD?

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

#PADCMD: mode



AT#PADCMD=?



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



## AT#PADFWD - PAD Forward Character

PAD forward character

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#PADFWD=<char>[,<mode>]**

Set command sets the char that immediately flushes pending data to socket opened by AT#SD command

Parameters:

Name	Type	Default	Description
<char>	integer	13	specifies the ascii code of the char used to flush data
Value:			
0÷255 : ascii code of the char used to flush data			
<mode>	integer	0	flush mode
Values:			
0 : normal mode			
1 : reserved			



Use AT#PADCMD to enable the socket char-flush activity



**AT#PADFWD?**

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

#PADFWD: <char>,<mode>





AT#PADFWD=?

Test command reports the supported range of values for parameters <char> and <mode>



## AT#BASE64 - Base64 Encoding/Decoding of Socket Sent/Received Data

This command is used to enable or disable base64 encoding and decoding data of a socket.



RFC 2045 - MIME  
RFC 3548

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#BASE64=<connId>,<enc>,<dec>[,<unused\_B>[,<unused\_C>]]

Set command enables base64 encoding and decoding of data sent/received to/from the socket in online or in command mode.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
<div>1÷max : socket connection identifier value (max value is returned by the Test command)</div>			
<enc>	integer	0	selects the encoding standard. The data received from serial port are base64 encoded according to the <enc> parameter and forwarded to the <connId> socket.
Values:			



<div> <div>0</div> <div>:</div> <div>no encoding of data received from serial port.</div> </div> <div> <div>1</div> <div>:</div> <div>base64 encoding compliant to RFC 2045 - MIME standard. As indicated from RFC2045 the encoded output stream is represented in lines of no more than 76 characters each. Lines are defined as sequences of octets separated by a CRLF sequence.</div> </div> <div> <div>2</div> <div>:</div> <div>base64 encoding compliant to RFC 3548 standard. As indicated from RFC3548 CRLF have not to be added.</div> </div>			
<dec>	integer	0	selects the decoding standard. The data received from the <connId> socket, are decoded according to the <dec> parameter and forwarded to the serial port.
<div>Values:</div> <div> <div>0</div> <div>:</div> <div>no decoding of data received from socket &lt;connId&gt;</div> </div> <div> <div>1</div> <div>:</div> <div>base64 decoding compliant to RFC 2045 - MIME standard. Decoding of data received from socket &lt;connId&gt; and sent to serial port. Same rule as for &lt;enc&gt; regarding line feeds in the received file that has to be decoded.</div> </div> <div> <div>2</div> <div>:</div> <div>base64 decoding compliant to RFC 3548 standard. Decoding of data received from socket &lt;connId&gt; and sent to serial port. Same rule as for &lt;enc&gt; regarding line feeds in the received file that has to be decoded.</div> </div>			
<unused_B>	integer	-	reserved for future use
<unused_C>	integer	-	reserved for future use



- ✦ It is possible to use command to change current <enc>/<dec> settings for a socket already opened in command mode or in online mode after suspending it. In this last case it is necessary to set AT#SKIPESC=1.
- ✦ To use #BASE64 in command mode, if data to send exceed maximum value for #SENDEXT command, they must be divided in multiple parts. These parts must be a multiple of 57 bytes, except for the last one, to distinguish EOF condition (Base64 encoding rules). For the same reason if #SRECV command is used by the application to receive data, a multiple of 78 bytes must be considered.
- ✦ To use #SRECV to receive data with <dec> enabled, it is necessary to consider that: reading <maxByte> bytes from socket, user will get less due to decoding that is performed.



#### AT#BASE64?

Read command returns the current <enc>/<dec> settings for all the six sockets. The format is:

```
#BASE64:<connId1>,<enc1>,<dec1>,0,0<CR><LF>
```

...

```
#BASE64:<connId6>,<enc6>,<dec6>,0,0<CR><LF>
```



#### AT#BASE64=?

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



- Skip the escape sequence, its transmission is not enabled  
AT#SKIPESC=1  
OK

Open a remote connection in online mode  
AT#SD=<connId>,<txProt>,<rPort>,<IPaddr>  
CONNECT  
data sent without modifications (default)

```
.....  
+++ (suspension)  
OK
```

Encode data coming from serial port.  
AT#BASE64=<connId>,1,0





OK

Resume suspended socket

AT#SO=<connId>

CONNECT

data received from serial port are base64 encoded and sent to the socket

.....

+++ (suspension)

OK

Decode data coming from socket.

AT#BASE64=<connId>,0,1

OK

Resume suspended socket

AT#SO=<connId>

CONNECT

data received from socket are base64 decoded and sent to the serial port

.....

+++ (suspension)

OK



## AT#FRWL - Firewall Setup

This command controls the internal firewall settings.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#FRWL=[<action>[,<ip\_addr>[,<net\_mask>]]]**

Set command controls the internal firewall settings

Parameters:

Name	Type	Default	Description
<action>	integer	0	command action
Values: ..... 0 : remove selected chain 1 : add an ACCEPT chain 2 : remove all chains (DROP everything); <ip_addr> and <net_mask> have no meaning in this case. .....			
<ip_addr>	string	-	remote address to be added into the ACCEPT chain; it can be any valid IP address in the format: xxx.xxx.xxx.xxx
<net_mask>	string	-	mask to be applied on the <ip_addr>; it can be any valid IP address mask in the format: xxx.xxx.xxx.xxx

Additional info:

### ►► Firewall criterion

The firewall applies for incoming (listening) connections only. Its general policy is DROP, therefore all packets that are not included into an ACCEPT chain rule will be silently discarded.



When a packet comes from the IP address `incoming_IP`, the firewall chain rules will be scanned for matching with the following criteria:

`incoming_IP & <net_mask> = <ip_addr> & <net_mask>`

If criterion is matched, then the packet is accepted and the rule scan is finished; if criteria are not matched for any chain the packet is silently dropped



AT#FRWL?

Read command reports the list of all ACCEPT chain rules registered in the Firewall settings in the format:

#FRWL: <ip\_addr>,<net\_mask>

#FRWL: <ip\_addr>,<net\_mask>

...

OK



AT#FRWL=?

Test command returns the allowed values for parameter <action>.



- Let assume we want to accept connections only from our devices which are on the IP addresses ranging from

197.158.1.1 to 197.158.255.255

We need to add the following chain to the firewall:

AT#FRWL=1,"197.158.1.1","255.255.0.0"

OK



## AT#E2SLRI - Socket Listen Ring Indicator

This command enables the Ring Indicator pin response to a Socket Listen connect.

SIM Presence	Setting saved	Can be aborted
Required	Common profile	No



**AT#E2SLRI=[<n>]**

Set command enables/disables the Ring Indicator pin response to a Socket Listen connect and, if enabled, the duration of the negative going pulse generated on receipt of connect.

Parameter:

Name	Type	Default	Description
<n>	integer	0	RI enabling
Values:			
0	:	RI disabled for Socket Listen connect	
50÷1150	:	RI enabled for Socket Listen connect; a negative going pulse is generated on receipt of connect and <n> is the duration in ms of this pulse	



**AT#E2SLRI?**

Read command reports whether the Ring Indicator pin response to a Socket Listen connect is currently enabled or not, in the format:

#E2SLRI: <n>



**AT#E2SLRI=?**

Test command returns the allowed values for parameter <n>.



## AT#ICMP - Ping Support

Set command enables/disables the ICMP Ping support.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#ICMP=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	1	ICMP mode selection.
Values:			
0 : disable ICMP Ping support			
1 : enable firewalled ICMP Ping support: the module is sending a proper ECHO_REPLY only to a subset of IP Addresses pinging it; this subset of IP Addresses has been previously specified through #FRWL command.			
2 : enable free ICMP Ping support; the module is sending ECHO_REPLY to every IP Address pinging it.			



AT#ICMP?

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

#ICMP: <mode>



AT#ICMP=?

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



## AT#PING - Send PING Request

This command is used to send Ping Echo Request.

SIM Presence	Setting saved	Can be aborted
Required	Other	No



**AT#PING=<IPAddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>[,<pdpId>]]]]]**

Execution command is used to send Ping Echo Request messages and to receive the corresponding Echo Reply. Before sending PING Request the PDP context must be activated by #SGACT command.

Once the single Echo Reply message is received, a string like that is displayed:

#PING: <replyId>,<Ip Address>,<replyTime>,<ttl>

Parameters:

Name	Type	Default	Description
<IPAddr>	string	-	address of the remote host, string type. This parameter can be either: <ul style="list-style-type: none"> <li>- any valid IP address in the format: "xxx.xxx.xxx.xxx"</li> <li>- any valid IPV6 address in the format: "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx"</li> <li>- any host name to be solved with a DNS query</li> </ul>
<retryNum>	integer	4	the number of Ping Echo Request to send
Value: <div> <div>1÷64</div> <div>:</div> <div>Ping Echo Request number</div> </div>			



<len>	integer	32	the length of Ping Echo Request message
Value:			
.....			
32÷1460 : Ping Echo Request length			
.....			
<timeout>	integer	50	the timeout, in 100 ms units, waiting a single Echo Reply
Value:			
.....			
1÷600 : timeout, in 100 ms units			
.....			
<ttl>	integer	128	time to live / Hop Limit (IPV6)
Value:			
.....			
1÷255 : time to live / Hop Limit			
.....			
<pdpld>	integer	-	specifies a PDP context definition. Use the AT+CGDCONT=? test command to get the range of the supported values. Refer to additional info section for default value.

Additional info:

►► <pdpld> default value.




The default value of this parameter depends on the software customization as shown in the following table.



Software customization	<pdpld> default value
Verizon	3
All other	1

Unsolicited fields:

Name	Type	Description
<replyId>	integer	Echo Reply number
<IpAddress>	string	IP address of the remote host
<replyTime>	integer	time, in 100 ms units, required to receive the response
<ttl>	integer	time to live / Hop Limit of the Echo Reply message

-  When the Echo Request timeout expires (no reply received on time) the response will contain <replyTime> set to 600 and <ttl> set to 255.
-  To receive the corresponding Echo Reply is not required to enable separately #ICMP
-  Echo Reply numbers <replyId> are not guaranteed to be in numerical sequence. Replies not in chronological order could happen due to network responses order.



AT#PING=?

Test command reports the supported range of values for the #PING command parameters.





```
</> AT#PING="www.telit.com"  
#PING: 01,"81.201.117.177",6,50  
#PING: 02,"81.201.117.177",5,50  
#PING: 03,"81.201.117.177",6,50  
#PING: 04,"81.201.117.177",5,50  
OK
```



## AT#QDNS - Query DNS

The command executes a DNS query

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#QDNS[=<host name>]**

Execution command executes a DNS query to solve the host name into an IP address. If the DNS query is successful, then the IP address will be reported in the result code as follows:

#QDNS: <host name>,<IP address>

Parameter:

Name	Type	Default	Description
<host name>	string	-	Host name string

Additional info:

►► IP address in the result code

Name	Type	Default	Description
<IP address>	string	-	IP address in format "xxx.xxx.xxx.xxx", or empty string if DNS query was unsuccessful.



The command activates the PDP context if it was not previously activated. In this case the context is deactivated after the DNS query.





This command requires that the authentication parameters are correctly set, and the PS network is present.



AT#QDNS=?

Test command returns the OK result code.



## AT#DNS - Manual DNS Selection

This command manually set primary and secondary DNS servers.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#DNS=<cid>,<primary>,<secondary>**

Set command allows to manually set primary and secondary DNS servers for a PDP context defined by +CGDCONT

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	context identifier
Value: <div> <div>1÷max</div> <div>: specifies a PDP context definition. The max value is returned by the test command</div> </div>			
<primary>	string	-	manual primary DNS server, in the format "xxx.xxx.xxx.xxx", used for the specified cid; we are using this value instead of the primary DNS server coming from the network (default is "0.0.0.0")
<secondary>	string	-	manual secondary DNS server, in the format "xxx.xxx.xxx.xxx", used for the specified cid; we are using this value instead of the secondary DNS server coming from the network (default is "0.0.0.0")



- ✦ If <primary> is "0.0.0.0" and <secondary> is not "0.0.0.0", then issuing AT#DNS=... returns an error.
- ✦ If <primary> is "0.0.0.0" we are using the primary DNS server coming from the network as consequence of a context activation.
- ✦ if <primary> is not "0.0.0.0" and <secondary> is "0.0.0.0", then we are using only the manual primary DNS server.
- ✦ The context identified by <cid> must be previously defined, otherwise issuing AT#DNS=... returns an error.
- ✦ Issuing AT#DNS=... returns an error if the context identified by <cid> has already been activated by AT commands.



#### AT#DNS?

Read command returns the manual DNS servers set for every defined PDP context and for the single GSM context (only if defined), in the format:

```
[#DNS: <cid>,<primary>,<secondary>[<CR><LF>
#DNS: <cid>,<primary>,<secondary>]]
```



#### AT#DNS=?

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



## AT#NWDNS - DNS from Network

The command allows to get the primary and secondary DNS addresses for selected GSM or PDP context identifiers

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#NWDNS=[<cid>[,...]]

Execution command returns either the primary and secondary DNS addresses for the GSM context (if specified) and/or a list of primary and secondary DNS addresses for the specified PDP context identifiers. The command returns a row of information for every specified <cid> whose context has been already defined. No row is returned for a <cid> whose context has not been defined yet. The response is in the form:

#NWDNS: <cid<sub>n</sub>>,<PDNSAddress<sub>n</sub>>,<SDNSAddress<sub>n</sub>><CR><LF>

#NWDNS: <cid<sub>p</sub>>,<PDNSAddress<sub>p</sub>>,<SDNSAddress<sub>p</sub>><CR><LF>

...

#NWDNS: <cid<sub>q</sub>>,<PDNSAddress<sub>q</sub>>,<SDNSAddress<sub>q</sub>><CR><LF>

Parameter:

Name	Type	Default	Description
<cid>	integer	N/A	Generic context identifier. The value of max is returned by the test command
Value:			
<div> <div>1÷max</div> <div>:</div> <div>specifies a particular PDP context definition (see +CGDCONT command)</div> </div>			

Additional info:

►► Parameters response description:



Name	Type	Default	Description
<PDNSAddress>	string	-	Generic primary DNS address or assigned during PDP (or GSM) context activation.
<SDNSAddress>	string	-	Generic secondary DNS address or assigned during PDP (or GSM) context activation.

- ✦ Entering AT#NWDNS= (no <cid> specified), the DNS addresses for all defined contexts are returned.
- ✦ Issuing the command with more than 6 input parameters raises an error.
- ✦ The command returns only one row of information for every specified <cid>, even if the same <cid> is present more than once.



AT#NWDNS=?

Test command returns a list of defined <cid>s.



## AT#NWMTUSIZE - MTU size from Network

This command returns IPv4 MTU used, one for each PDP context. This is equal to the MTU provided by the Network, if provided. If MTU is not provided by the Network, it is equal to the default MTU.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#NWMTUSIZE=[<cid>]**

Execution command returns IPv4 MTU used, one for each PDP context. This is equal to the MTU provided by the Network, if provided. If MTU is not provided by the Network, it is equal to the default MTU.

Parameter:

Name	Type	Default	Description
<cid>	integer	N/A	numeric parameter which specifies a particular PDP context definition
<p>Value:</p> <p>.....</p> <p>1÷max : specifies a particular PDP context definition (see +CGDCONT command)</p> <p>.....</p>			

Additional info:

►► Response format is:

#NWMTUSIZE: <cid>,<MTU>[<CR><LF>

#NWMTUSIZE: <cid>,<MTU> [...]





Name	Type	Default	Description
<cid>	integer	-	context identifier
<MTU>	integer	-	MTU provided by the Network, if provided. If MTU is not provided by the Network, it is equal to the default MTU



If no <cid> is specified, the MTUs for all defined contexts are returned.



AT#NWMTUSIZE=?

Test command returns the OK result code



## AT#NTP - Calculate and Update Date and Time with NTP

The command handles the date and time update using NTP protocol.



[1] Standard RFC2030

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#NTP=<NTPAddr>,<NTPPort>,<updModClock>,<timeout>[,<timeZone>]

Execution command permits to calculate and update date and time through NTP protocol sending a request to a NTP server, see standard [1]. The command returns an intermediate response having the following format:

#NTP: <time>

The <time> parameter is described in Additional info section.

Parameters:

Name	Type	Default	Description
<NTPAddr>	string	address of the NTP server. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" or "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" - any host name to be solved with a DNS query	
<NTPPort>	integer	N/A	NTP server port to contact



Value: <div> <div>1÷65535</div> <div>:</div> <div>port</div> </div>			
<updModClock>	integer	N/A	update mode
Values: <div> <div>0</div> <div>:</div> <div>no update module clock</div> </div> <div> <div>1</div> <div>:</div> <div>update module clock</div> </div>			
<timeout>	integer	N/A	waiting timeout for server response in seconds. Due to internal algorithm the total timeout will be up to 3* <timeout>.
Value: <div> <div>1÷10</div> <div>:</div> <div>waiting timeout for server response in seconds</div> </div>			
<timeZone>	string	0	Time Zone: indicates the difference, expressed in quarter of an hour, between the



local time  
and GMT.

Value:

47÷48 : Time Zone

Additional info:

►► Intermediate response parameter.

Name	Type	Default	Description
<time>	string	-	current time as quoted string in the format: "yy/MM/dd,hh:mm:ss±zz"

►► In case of error, the command returns the following error message:

+CME ERROR: <err>

Parameter <err> can be either numeric or verbose (see +CMEE). The available values are reported in the table:

Numeric Format	Verbose Format
30001	sntp - not enough resources
30002	sntp - net timeout
30003	sntp - socket error
30005	sntp - host name resolve error



30006	sntp - invalid parameter
30008	sntp - send timeout
30009	sntp - send error
30011	sntp - response timeout
30015	sntp - context not opened
30020	sntp - generic error
30030	sntp - server authentication fail
30031	sntp - server keys file missing
30200	sntp - cannot set time



The Time Zone is applied directly in the Date and Time received by the NTP Server, that is, by definition, GMT+0.



#SGACT must be called to activate the PDP context before calling #NTP command.



#### AT#NTP=?

Test command returns the maximum length for <NTPAddr> string, and supported range of values of parameters: <NTPPort>, <updModClock>, <timeout> and <timeZone>.



MAX timeout indicates the time within which the command must be executed. MAX timeout for this command is 10 s.





Execution command with NTP server.

```
AT#NTP="0.it.pool.ntp.org",123,1,2,4
```

```
#NTP: 19/03/13, 13:16:33+04
```

```
OK
```

```
AT+CCLK?
```

```
+CCLK: "19/03/13, 13:16:34+04"
```

```
OK
```



## AT#GDATAVOL - PS Data Volume

The command resets data counters or reports data counts of PS sessions

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#GDATAVOL=[<mode>]**

Execution command reports, for every active PDP context, the amount of data transmitted or received in the last PS session, or it will report the total amount of data transmitted and received during all past PS sessions, since last reset.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	resets or reads data counters
Values:			
<p>0 : resets the PS data counter for all available PDP contexts</p> <p>1 : reports the last PS session data counter for all set PDP contexts (i.e. all PDP contexts with APN parameter set using +CGDCONT). Refer to Additional info section to see the format.</p> <p>2 : reports the total PS data counter, since last reset, for all set PDP contexts (i.e. all PDP context with APN parameter set using +CGDCONT). Refer to Additional info section to see the format.</p>			

Additional info:



- When <mode>=1, the command returns the following last data counts:

The message format is:

#GDATAVOL: <cid<sub>n</sub>>,<tot<sub>n</sub>>,<sent<sub>n</sub>>,<received<sub>n</sub>>[<CR><LF>

..

#GDATAVOL: <cid<sub>m</sub>>,<tot<sub>m</sub>>,<sent<sub>m</sub>>,<received<sub>m</sub>>[ ... ]]

Each message line shows the data related to the n-th, m-th, and so on <cid>.

Name	Type	Default	Description
<cid>	integer	-	context identifier. Refer to +CGDCONT test command to know the values range supported
<totn>	integer	-	number of bytes either received or transmitted in the last PS session for <cid <sub>n</sub> > PDP context
<sentn>	integer	-	number of bytes transmitted in the last PS session for <cid <sub>n</sub> > PDP context
<receivedn>	integer	-	number of bytes received in the last PS session for <cid <sub>n</sub> > PDP context

- When <mode>=2, the command returns the following total data counts, since last reset executed by AT#GDATAVOL=0

The message format is:

#GDATAVOL: <cid<sub>n</sub>>,<tot<sub>n</sub>>,<sent<sub>n</sub>>,<received<sub>n</sub>>[<CR><LF>

..

#GDATAVOL: <cid<sub>m</sub>>,<tot<sub>m</sub>>,<sent<sub>m</sub>>,<received<sub>m</sub>>[ ... ]]

Each message line shows the data related to the n-th, m-th, and so on <cid>.





Name	Type	Default	Description
<totn>	integer	-	number of bytes either received or transmitted, in every PS session since last reset, for <cid <sub>n</sub> > PDP context
<sentn>	integer	-	number of bytes transmitted, in every PS session since last reset, for <cid <sub>n</sub> > PDP context
<receivedn>	integer	-	number of bytes received, in every PS session since last reset, for <cid <sub>n</sub> > PDP context

- ✚ Last PS session counters are not saved in NVM and are therefore lost at power off.
- ✚ Total PS session counters are saved in NVM.



AT#GDATAVOL=?

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



## AT#SCFGEXT3 - Socket Configuration Extended 3

This command sets the socket configuration extended parameters for features not included in #SCFGEXT command nor in #SCFGEXT2 command.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SCFGEXT3=

<connId>,<immRsp>[,<closureTypeCmdModeEnabling>[,<fastSRING>[,<ssendTimeout>[,<unusedD>]]]]

Parameters:


Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value: <div> 1÷max : socket connection identifier value (max value is returned by the test command) </div>			
<immRsp>	integer	0	enables #SD command mode immediate response
Values: <div> 0 : #SD in command mode (see #SD) returns after the socket is connected </div>			



		<p>1 : #SD in command mode returns immediately; then the state of the connection can be read by the AT command #SS</p> <p>.....</p>	
	<closureTypeCmdModeEnabling>	integer 0	it has no effect and is included only for backward compatibility
		Value:	
		0	: factory default
	<fastSRING>	integer 0	it has no effect and is included only for backward compatibility
		Value:	
		0	: factory default
	<ssendTimeout>	integer 0	timeout for #SSEND
		Values:	
		0	: no timeout
		1	: immediate exit(error) in case of stack temporary suspended internally
		100÷600	: timeout in 100 msec units
			.....




<unusedD>	mixed	0	unused parameter
Value: ..... 0 : factory default .....			



### AT#SCFGEXT3?

Read command returns the current socket extended configuration parameters values for all the max sockets, in the format:

#SCFGEXT3:  
<connId<sub>1</sub>>,<immRsp<sub>1</sub>>,<closureTypeCmdModeEnabling>,  
<fastsring>,<ssendTimeout>,0<CR><LF>  
...  
#SCFGEXT3:  
<connId<sub>max</sub>>,<immRsp<sub>max</sub>>,<closureTypeCmdModeEnabling>,  
<fastsring>,<ssendTimeout>,0<CR><LF>



### AT#SCFGEXT3=?

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



## AT#NTPCFG - Configure NTP Parameters

This set command allows to configure additional parameters to be used for NTP operations.



[1] Standard RFC5905

SIM Presence	Setting saved	Can be aborted
Required	Auto	No






AT#NTPCFG=<cid>[,<authType>,<KeyId>,<keysFilePath>]

Parameters:

Name	Type	Default	Description
<cid>	integer	-	context id used to perform NTP operations. Refer to test command to know the supported range of values.
<authType>	integer	0	authentication type to be used with NTP server
Values: <div>             0 : do not authenticate server                           1 : use symmetric key to authenticate server (see standard [1]), using &lt;KeyId&gt; and &lt;KeysFilePath&gt; to retrieve the required parameters           </div>			
<KeyId>	integer	-	if <authType> is 1, it provides the key Id to authenticate the server
<keysFilePath>	string	-	if <authType> is 1, it provides the absolute path of the file where the server keys can be found. Only MD5 keys are supported.



-  The file containing the keys can be loaded in the module filesystem using #M2MWRITE command.
-  The key content is loaded from the file only when #NTP is issued.
-  <cid> default value: 3 for Verizon, 1 otherwise.



AT#NTPCFG?

Read command reports the parameters current values in the format:

#NTPCFG:<cid>,<authType >



AT#NTPCFG=?

Test command reports the available range of <cid>, <authType> and <KeyId> parameters values.



Set <cid>=3

AT#NTPCFG=3

OK

Set <cid>=1, symmetric key mode, <keyId>=1 and load the keys from the provided file

AT#NTPCFG=1,1,1,"/mod/server\_keys.txt"

OK



## AT#TCPMAXWIN - Set maximum TCP window size

This command sets and configures the TCP window size.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#TCPMAXWIN=<TCPMaxWin>[,<TCPWinScale>]

This command permits to configure the TCP window size and scale.

Parameters:

Name	Type	Default	Description
<TCPMaxWin>	integer	0	TCP maximum window size; the value of max is returned by the Test Command

Values:

0 : TCP window size is decided internally by the TCP/IP stack

536÷max : TCP maximum window size value



<TCPWinScale>	integer	0	TCP window scale
---------------	---------	---	------------------

Values:

0 : TCP window scale is decided internally by the TCP/IP stack

1÷8 : TCP window scale value



- 
-  If <TCPMaxWin> and <TCPWinScale> are set to 0 then values are decided internally by the TCP/IP stack.
  -  TCP/IP stack could use a value of TCP window size smaller than the one set in AT command because of internal buffers memory limitations.
- 



#### AT#TCPMAXWIN?

Read command returns the current setting of <TCPMaxWin> and <TCPWinscale> parameters in the format:

#TCPMAXWIN: <TCPMaxWin>,<TCPWinscale>



#### AT#TCPMAXWIN=?

Test command returns the supported range of values for parameters <TCPMaxWin> and <TCPWinscale>.

---





# FTPEasy



## AT#FTPAPP - FTP Append

This command is used to append data to an already existing file via FTP during an FTP session.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#FTPAPP=<fileName>[,<connMode>]**

Set command, issued during an FTP connection, opens a data connection and append data to existing <fileName> file.

If the data connection succeeds, a **CONNECT** indication is sent, afterward a **NO CARRIER** indication is sent when the socket is closed.

Parameters:

Name	Type	Default	Description
<fileName>	string	-	the file name
<connMode>	integer	0	the connection mode
Values:			
.....			
0 : online mode			
1 : command mode			
.....			

- ✦ If <connMode> is set to 1, the data connection is opened, the device remains in command mode and the OK result code is displayed (instead of **CONNECT**).
- ✦ Use the escape sequence +++ to close the data connection.
- ✦ The command causes an **ERROR** result code if no FTP connection has been opened yet.



**AT#FTPAPP=?**

Test command reports the maximum length of <fileName> and the supported range of values of <connMode>. The format is:



#FTPAPP: <length>, (list of supported <connMode>s)

Additional info:

►► Parameter meaning.

Name	Type	Default	Description
<length>	integer	-	is the maximum length of <fileName>



## AT#FTPAPPEXT - FTP Append Extended

The command sends data on a FTP data port while the module is in command mode.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPAPPEXT=<bytesToSend>[,<eof>]**

Execution command sends data on a FTP data port while the module is in command mode.

FTP data port must be previously opened by #FTPPUT (or #FTPAPP) with <connMode> parameter set to command mode connection.

After command line is terminated with <CR>, the module responds sending a four characters sequence prompt, and waits for the specified number of bytes:

<CR><LF><greater\_than><space> (IRA 13, 10, 62, 32)

When <bytesToSend> bytes have been sent, operation is automatically completed. If (all or part of the) data are successfully sent, then the response is:

#FTPAPPEXT: <sentBytes>  
OK

If data sending fails for some reason, an error code is reported.

Parameters:

Name	Type	Default	Description
<bytesToSend>	integer	N/A	number of bytes to be sent
Value:			
<div> <div>1÷1500</div> <div>:</div> <div>number of bytes</div> </div>			



<eof>	integer	0	data port closure
Values:			
.....			
0	:	normal sending of data chunk	
.....			
1	:	close data port after sending data chunk	
.....			

Additional info:

▶▶ Parameters:

Name	Type	Default	Description
<sentBytes>	integer	N/A	the number of sent bytes
Value:			
.....			
1÷1500		:	number of bytes
.....			



<sentBytes> could be less than <bytesToSend>.



AT#FTPAPPEXT=?

Test command reports the supported values of parameters <bytesToSend> and <eof>.





```
AT#FTPOPEN="IP",username,password  
OK
```

```
AT#FTPPUT=<filename>,1  
OK
```

the second param (1) means that we open the connection in command mode  
Here data socket will stay opened, but interface will be available (command mode)

```
AT#FTPAPPEXT=Size  
>binary data  
#FTPAPPEXT: <sentBytes>  
OK
```

write here the binary data. As soon Size bytes are written, data are sent and OK is returned

Last #FTPAPPEXT will close the data socket, because second (optional) parameter has this meaning:

```
AT#FTPAPPEXT=Size,1  
>binary data  
#FTPAPPEXT: <sentBytes>  
OK
```

write here the binary data. As soon Size bytes are written, data are sent and OK is returned and the data socket is closed.

If the user has to reopen the data port to send another (or append to the same) file, they can restart with #FTPPUT (or #FTPAPP).

Then #FTPAPPEXT to send the data chunks on the reopened data port.

If, while sending the chunks, the data port is closed from remote, user will be aware of it because #FTPAPPEXT will indicate ERROR and cause (available if previously issued the command AT+CMEE=2) will indicate that socket has been closed.

Also in this case obviously, data port will have to be reopened with #FTPPUT and the related commands.



## AT#FTPCLOSE - FTP Close Command

The command purpose is to close the previously open FTP connection.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPCLOSE**

Execution command closes an FTP connection.



**AT#FTPCLOSE=?**

Test command returns the OK result code.



## AT#FTPCMD - FTP Send Commands

This command sends an FTP command or a combination of two commands to an FTP server.

SIM Presence	Setting saved	Can be aborted
Required	Other	No

AT#FTPCMD=<command1>,<respCode1>[,<command2>,<respCode2>]

Execution command, issued during an FTP connection, sends <command1> to an FTP server and expects <respCode1> reply. Optionally, after the execution of the first command, a second command can be sent (<command2> and <respCode2>).

Parameters:

Name	Type	Default	Description
<command1>	string	-	name of the 1 <sup>st</sup> command (maximum length 200 characters)
<respCode1>	integer	N/A	Expected response code from FTP server after <command1> execution
<div>Values:</div> <div><div>1</div><div>:</div><div>Expected code 1XY</div></div> <div><div>2</div><div>:</div><div>Expected code 2XY</div></div> <div><div>3</div><div>:</div><div>Expected code 3XY</div></div> <div><div>4</div><div>:</div><div>Expected code 4XY</div></div> <div><div>5</div><div>:</div><div>Expected code 5XY</div></div>			
<command2>	string	-	name of the 2 <sup>nd</sup> command (maximum length 200 characters)





<respCode2>	integer	N/A	Expected response code from FTP server after <command2> execution
-------------	---------	-----	---

Values:

1	:	Expected code 1XY
2	:	Expected code 2XY
3	:	Expected code 3XY
4	:	Expected code 4XY
5	:	Expected code 5XY



The command causes an ERROR result code to be returned if no FTP connection has been opened yet.



To read unexpected ERROR result codes returned from the FTP server, use AT#FTPMSG command.

## AT#FTPCMD=?

Test command reports the maximum length of <command1> and <command2> and the supported range of values of <respCode1> and <respCode2>.

Additional info:



The format is:

#FTPCMD: <length>, (list of supported <respCode1>s), <length>, (list of supported <respCode2>s)

Name	Type	Default	Description
------	------	---------	-------------



<length> integer - maximum length of <command1> or  
<command2>



#### Examples of command executions.

- Rename file on remote server:  
at#ftpcmd="RNFR test.txt",3,"RNT0 test2.txt",2  
350 File or directory exists, ready for destination name  
250 Rename successful  
OK  
...  
...  
Create directory on remote server:  
at#ftpcmd="MKD testDir",2  
257 "/testDir" - Directory successfully created  
OK  
...  
...  
Remove Directory on remote server:  
at#ftpcmd="RMD testDir",2  
250 RMD command successful  
OK  
...  
...



## AT#FTPCWD - FTP Change Working Directory

Command to change the working directory on FTP server.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPCWD=[<dirname>]**

Execution command, issued during an FTP connection, changes the working directory on FTP server.

Parameter:

Name	Type	Default	Description
<dirname>	string	-	Name of the new working directory.



The command causes an ERROR result code to be returned if no FTP connection has been opened yet.



**AT#FTPCWD=?**

Test command returns the OK result code.



## AT#FTPDELE - FTP Delete

This command, issued during a FTP connection, allows to delete a file from the remote working directory.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPDELE=[<filename>]**

Execution command, issued during a FTP connection, deletes a file from the remote working directory.

Parameter:

Name	Type	Default	Description
<filename>	string	-	Name of the file that must be deleted



This command returns an ERROR result code if no FTP connection has been opened yet.



This command returns an ERROR result code in case of delayed server response. If this is the case, the #FTPMSG response is temporarily empty; a later check of the #FTPMSG response will show the server response.



**AT#FTPDELE=?**

Test command returns OK result code.



## AT#FTPFSIZE - Get File Size from FTP Server

This command returns the size of a file located on a FTP server.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPFSIZE=<filename>**

Execution command, issued during an FTP connection, permits to get the size of a file located on a FTP server. The response format is:

#FTPFSIZE: <size>

Parameter:

Name	Type	Default	Description
<filename>	string	-	the name of the file that you want to know the size

Additional info:



Parameter:

Name	Type	Default	Description
<size>	integer	-	dimension in bytes of the file located on the FTP server



AT#FTPTYPE=0 command must be issued before #FTPFSIZE command, to set file transfer type to binary mode.



**AT#FTPFSIZE=?**

Test command returns OK result code.



## AT#FTPGET - FTP Get Command

This command executes the FTP Get function during an FTP connection.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#FTPGET=[<filename>]**

Execution command opens a data connection and starts getting a file from the FTP server. If the data connection succeeds a CONNECT indication is sent and the file is received on the serial port.

Parameter:

Name	Type	Default	Description
<filename>	string	-	file name to get from server.



The command causes an ERROR result code to be returned in case no FTP connection has been opened yet.



Command closure should always be handled by application. To avoid download stall situations a timeout should be implemented by the application.



**AT#FTPGET=?**

Test command returns the OK result code.



## AT#FTPGETF - Receive and Store FTP Server Data

This command downloads a file from a FTP server.

SIM Presence	Setting saved	Can be aborted
Required	No	Yes



**AT#FTPGETF=<src\_filename>,<dest\_filename>[,<verbose>[,<overwrite\_file>]]**




Execution command, issued during a FTP connection, opens a data connection and starts downloading a file from the FTP server.

The file is saved into module's file system.

Parameters:

Name	Type	Default	Description
<src_filename>	string	-	name of the file to be downloaded
<dest_filename>	string	-	name of the destination file to be written into the module file system
<verbose>	integer	0	enable/disable verbose mode
Values: <div> <div>0 : disable verbose mode</div> <div>1 : enable verbose mode</div> </div>			
<overwrite_file>	integer	0	file overwriting allowed/not allowed
Values: <div> <div>0 : overwrite NOT allowed (if file exists, the AT command returns ERROR)</div> <div>1 : overwrite allowed (if file exists, it will be overwritten)</div> </div>			



-  This command returns an ERROR result code if no FTP connection has been opened yet.
-  Command closure should always be handled by application. A timeout should be implemented by the application to avoid download stall situations.
-  When verbose mode is enabled, i.e. <verbose> is set to 1, the '#' character is printed on the AT command port for every 4096 bytes that were written in FS



#### AT#FTPGETF=?

Test command returns the maximum length of <src\_filename> and <dest\_filename> and the supported range of parameters <verbose> and <overwrite\_file>.





## AT#FTPGETPKT - FTP Get in Command Mode

FTP gets in command mode.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPGETPKT=<fileName>[,<viewMode>]**

Execution command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server while remaining in command mode.

The data port is opened, we remain in command mode and we see the result code OK. Retrieval from FTP server of <fileName> is started, but data are only buffered in the module.

It is possible to read data afterwards issuing #FTPRECV command.

Parameters:

Name	Type	Default	Description
<fileName>	string	-	file name. Maximum length: 200 characters.
<viewMode>	integer	0	choose the view mode
Values:			
.....			
0 : text format			
1 : hexadecimal format			
.....			



The command causes an ERROR result code to be returned in case no FTP connection has been opened yet.



Command closure should always be handled by application. To avoid download stall situations a timeout should be implemented by the application.



**AT#FTPGETPKT?**

Read command reports current download state for <fileName> with <viewMode> chosen, in the format:



#FTPGETPKT: <remoteFile>,<viewMode>,<eof>

Additional info:

►► The following parameter signals the state of the file transmission.

Name	Type	Default	Description
<eof>	integer	A	End of file
Values:			
.....			
0	:	file currently being transferred	
1	:	complete file has been transferred to FTP client	
.....			



AT#FTPGETPKT=?

Test command returns OK result code.



## AT#FTPLIST - FTP List

This command is used during a FTP connection.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#FTPLIST[=[<name>]]

Execution command, issued during an FTP connection, opens a data connection and starts getting from the server the list of contents of the specified directory or the properties of the specified file

Parameter:

Name	Type	Default	Description
<name>	string	-	is the name of the directory or file



The command causes an ERROR result code to be returned if no FTP connection has been opened yet.



Issuing AT#FTPLIST<CR> opens a data connection and starts getting from the server the list of contents of the working directory.



### AT#FTPLIST=?

Test command returns the OK result code.



## AT#FTPMSG - FTP Read Message

This command returns the last response received from the FTP server.

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#FTPMSG

Execution command returns the last response received from the server during an FTP connection.



### AT#FTPMSG=?

Test command returns the OK result code.



## AT#FTPOPEN - FTP Connection Opening

This execution command opens an FTP connection toward the FTP server.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#FTPOPEN=[<server:port>,<username>,<password>,<mode>[,<cid>]]

Parameters:

Name	Type	Default	Description
<server:port>	string	-	address and port of FTP server (factory default port 21), in the format: "ipv4" / "ipv4:port" "ipv6" / "[ipv6]" / "[ipv6]:port" "dynamic_name" / "dynamic_name:port"
<username>	string	-	authentication user identification for FTP
<password>	string	-	authentication password for FTP
<mode>	integer	0	active or passive mode
Values: ..... 0 : active mode ..... 1 : passive mode .....			
<cid>	string	-	PDP context identifier



In FTP Open case, the solution dependency limits the maximum time out to 1200 (120 seconds). The FTPTO value that exceed 1200 is considered as 1200.



Before opening FTP connection the PDP context must been activated with #SGACT.





AT#FTPOPEN=?

Test command returns the OK result code



## AT#FTPPUT - FTP Send File

This command sends a file to the FTP server.

SIM Presence	Setting saved	Can be aborted
Required	Other	No



**AT#FTPPUT=[<filename>[,<connMode>]]**

Execution command, issued during an FTP connection, opens a data connection and starts sending <filename> file to the FTP server.

Parameters:

Name	Type	Default	Description
<filename>	string	-	name of the file (maximum length 200 characters)
<connMode>	integer	0	<p>select online or command mode:</p> <p>If online mode is selected (default) and the data connection succeeds, a CONNECT indication is sent; afterward a NO CARRIER indication is sent when the socket is closed.</p> <p>If command mode is selected and the data connection succeeds, we remain in command mode and we see the result code OK (instead of CONNECT).</p>
<p>Values:</p> <p>0 : online mode</p> <p>1 : command mode</p>			



Use the escape sequence +++ to close the data connection.



The command causes an ERROR result code to be returned if no FTP connection has been opened yet.





## AT#FTPPUT=?

Test command reports the maximum length of <filename> and the supported range of values of <connMode>.

Additional info:



The format is:

#FTPPUT: <length>, (list of supported <connMode>s)

Name	Type	Default	Description
<length>	integer	-	maximum length of <filename>





## AT#FTPPWD - FTP Print Working Directory

This command, issued during an FTP connection, shows the current working directory on FTP server.

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#FTPPWD

Execution command, issued during an FTP connection, shows the current working directory on FTP server.



The command causes an ERROR result code to be returned if no FTP connection has been opened yet.



### AT#FTPPWD=?

Test command returns the OK result code.



## AT#FTP\_RECV - Receive Data in Command Mode

The command permits the user to read a given amount of data already transferred via FTP from a remote file.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#FTP\_RECV=<blockSize>**

Execution command permits the user to transfer at most <blocksize> bytes of remote file, provided that retrieving from the FTP server has been started with a previous #FTP\_GETPKT command, onto the serial port.

This number is limited to the current number of bytes of the remote file which have been transferred from the FTP server.

Parameter:

Name	Type	Default	Description
<blockSize>	integer	N/A	maximum number of bytes to read
Value:			
<div> <div>1÷3000</div> <div>:</div> <div>maximum number of bytes to read</div> </div>			

- ✦ It is necessary to have previously opened FTP data port and started download and buffering of remote file through #FTP\_GETPKT command.
- ✦ Issuing #FTP\_RECV when there is no FTP data port opened raises an error.
- ✦ Data port will stay opened if socket is temporary waiting to receive data (#FTP\_RECV returns 0 and #FTP\_GETPKT gives an EOF 0 indication).





## AT#FTP\_RECV?

Read command reports the number of bytes currently transferred from FTP server in the format:

#FTP\_RECV: <available>

Additional info:

▶▶ Parameter:

Name	Type	Default	Description
<available>	integer	-	number of transferred bytes and available for reading



## AT#FTP\_RECV=?

Test command returns the supported values for parameter <blocksize>.



## AT#FTP\_RECV?

#FTP\_RECV: 3000

OK

Read required part of the buffered data:

AT#FTP\_RECV=400

#FTP\_RECV:400

Text row number 1 \* 11111111111111111111111111111111 \*

Text row number 2 \* 22222222222222222222222222222222 \*

Text row number 3 \* 33333333333333333333333333333333 \*

Text row number 4 \* 44444444444444444444444444444444 \*

Text row number 5 \* 55555555555555555555555555555555 \*

Text row number 6 \* 66666666666666666666666666666666 \*

Text row number 7 \* 77777777777777777777777777777777 \*

Text row number 8 \* 88888888888888888888888888888888



OK

AT#FTPRECV=200

#FTPRECV:200

88888 \*

Text row number 9 \* 99999999999999999999999999999999 \*

Text row number 10 \* AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA \*

Text row number 11 \* BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB \*

Text row number 12 \* CCCCCCCCCCCCCCCC

OK

To check when you have received complete file it is possible to use #FTPGETPKT read command:

AT#FTPGETPKT?

```
#FTPGETPKT:sample.txt,0,1
```

OK

(you will get <eof> set to 1)

## AT#FTPREST - Set Restart Position for FTP GET

Set command sets the restart position for successive #FTPGET (or #FTPGETPKT) command. It permits to restart a previously interrupted FTP download from the selected position in byte.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#FTPREST=[<restartPosition>]

Parameter:

Name	Type	Default	Description
<restartPosition>	integer	-	position in byte of restarting for successive #FTPGET (or #FTPGETPKT)



It is necessary to issue #FTPType=0 before successive #FTPGET (or #FTPGETPKT command) to set binary file transfer type.



Setting <restartPosition> takes effect on successive FTP download. After successive successfully initiated #FTPGET (or #FTPGETPKT) command <restartPosition> is automatically reset.



Value set for <restartPosition> takes effect on next data transfer (data port opened by #FTPGET or #FTPGETPKT). Then <restartPosition> value is automatically assigned to 0 for next download.



AT#FTPREST?

Read command returns the current <restartPosition>:

#FTPREST:<restartPosition>



AT#FTPREST=?

Test command returns the OK result code.



## AT#FTPTO - FTP Time Out

Set the FTP time out.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#FTPTO=[<tout>]**

Set command sets the time out used when opening either the FTP control channel or the FTP traffic channel.

Parameter:

Name	Type	Default	Description
<tout>	integer	100	time out in 100 milliseconds units
Value:			
<div> <div>100÷5000</div> <div>:</div> <div>hundreds of milliseconds</div> </div>			



**AT#FTPTO?**

Read command returns the current FTP operations time out in the format:

#FTPTO: <tout>



**AT#FTPTO=?**

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



## AT#FTPTYPE - FTP Type

This command sets the FTP file transfer type.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#FTPTYPE=[<type>]**

Set command, issued during a FTP connection, sets the file transfer type.

Parameter:

Name	Type	Default	Description
<type>	integer	N/A	file transfer type
Values:			
.....			
0		:	binary
1		:	ASCII
.....			



The command causes an ERROR result code to be returned if no FTP connection has been opened yet.



**AT#FTPTYPE?**

Read command returns the current file transfer type, in the format:

#FTPTYPE: <type>



**AT#FTPTYPE=?**



Test command returns the range of available values for parameter <type>:

#FTPTYPE: (0,1)





## AT#FTPCFG - FTP Configuration

This command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#FTPCFG=<tout>,<IPPignoring>[,<FTPSEn>[,<FTPext>]]

Parameters:

Name	Type	Default	Description
<tout>	integer	100	time out in 100 milliseconds units
Value:  100÷5000 : hundreds of ms			
<IPPignoring>	integer	N/A	enable or disable IP private ignoring
Values:  0 : No IP Private ignoring. During a FTP passive mode connection client uses the IP address received from server, even if it is a private IPV4 address.  1 : IP Private ignoring enabled. During a FTP passive mode connection if the server sends a private IPV4 address the client doesn't consider this and connects with server using the IP address used in #FTPOPEN.			



<FTPSEn>	integer 0		disable FTPS security
	Values:  ..... 0 : disable FTPS security: all FTP commands will perform plain FTP connections.  1 : enable FTPS security  .....		
<FTPext>	integer 1	PORT/PASV and EPRT/EPSV commands.	Option added to pass-through firewall that is unaware of the extended FTP commands for #FTPPUT, #FTPLIST, #FTPAPP, #FTPGET.
	Values:  ..... 0 : always use EPRT and EPSV commands  1 : if both module and server ipv4 use PORT and PASV commands  .....		



If parameter <tout> is omitted the behavior of set command is the same as read command.



#### AT#FTPCFG?

Read command reports the currently selected parameters in the format:



#FTPCFG: <tout>,<IPPignoring>,<FTPSEn>,<FTPext>



AT#FTPCFG=?

Test command reports the supported range of values for parameter(s): <tout>,<IPPignoring>,<FTPSEn>, and <FTPext>.



# SMTP



## AT#ESMTP - E-mail SMTP Server

This command allows to set the SMTP server address for e-mail sending.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT#ESMTP=<smtp>

Set command sets the SMTP server address, used for sending e-mails. SMTP server can be specified as IP address or as nick name.

Parameter:

Name	Type	Default	Description
<smtp>	string	-	SMTP server address. This parameter can be either:  - any valid IP address in the format: "xxx.xxx.xxx.xxx"  - any host name to be solved with a DNS query in the format: <host name> (factory default is the empty string "").



The SMTP server used shall be inside the APN space (the SMTP server provided by the network operator) or it must allow the relay, otherwise the command will refuse to send the e-mail.



### AT#ESMTP?

Read Command reports the current SMTP server address, in the format:

#ESMTP: <smtp>



### AT#ESMTP=?



Test command returns the max length for the parameter <smtp>.



Example of SMTP server format name:

```
AT#ESMTP="smtp.mydomain.com"  
OK
```



## AT#EMAILMSG - SMTP Read Message

The command returns the last response from SMTP server.

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



### AT#EMAILMSG

Execution command returns the last response from SMTP server.



### AT#EMAILMSG=?

Test command returns the OK result code.



## AT#SMTPCFG - Configure SMTP Parameters

Configure SMTP parameters

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#SMTPCFG=<ssl\_enabled>[,<port>[,<mode>[,<unused1>[,<unused2>[,<cid>]]]]]

Sets the parameters needed to the SMTP connection

Parameters:

Name	Type	Default	Description
<ssl_enabled>	integer	0	Numeric parameter indicating if the SSL encryption is enabled
Value:			
0 : SSL encryption disabled			
<port>	string	25	SMTP port to contact
Value:			
1÷65535 : SMTP ports to contact			
<mode>	integer	0	SMTP start session command
Values:			
0 : SMTP start session command HELO			
1 : SMTP start session command EHLO			
<unused1>	integer	0	for future purposes





Value:		
.....		
0	:	use this value
.....		
<unused2>	integer 0	for future purposes
Value:		
.....		
0	:	use this value
.....		
<cid>	integer A	PDP context identifier. Refer to additional info section for default value.
Value:		
.....		
1÷6	:	available value
.....		

#### Additional info:

##### ►► <cid> default value.

The default value of this parameter depends on the software customization as shown in the following table.

Software customization	<cid> default value
Verizon	3
All other	1



#### AT#SMTPCFG?

Returns the current settings in the format:

#SMTPCFG:<ssl\_enabled>,<port>,<mode>,0,0,<cid><CR><LF>



**AT#SMTPCFG=?**

Returns the supported range of parameters <ssl\_enabled>, <port>, <mode> in the format:



#SMTPCFG:(list of supported<ssl\_enabled>s),(list of supported <port>s), (list of supported <mode>s), (0), (0), (0)



# AT#ERST - E-mail Parameters Reset

This execution command resets the e-mail parameters to the "factory default" configuration.

SIM Presence	Setting saved	Can be aborted
Not required	No	No

	<b>AT#ERST</b> The e-mail parameters to reset are: E-mail User Name E-mail Password E-mail Sender Address E-mail SMTP server
	<b>AT#ERST=?</b> Test command returns the OK result code.



## AT#ESAV - E-mail Parameters Save

This execution command stores the e-mail parameters in the NVM.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#ESAV

The e-mail parameters that are stored are:

E-mail User Name

E-mail Password

E-mail Sender Address

E-mail SMTP server



### AT#ESAV=?

Test command returns the OK result code.



If a parameter value has not been previously specified using the e-mail parameters setting commands, like #EADDR, then a default value will be taken.



## AT#EUSER - E-mail Authentication User Name

This command sets the user identification string to be used during the SMTP authentication step.

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



AT#EUSER=[<eUser>]

Parameter:

Name	Type	Default	Description
<eUser>	string	""	string containing the e-mail authentication User ID
Value:			
"" : factory default			



If no authentication is required then the <eUser> parameter must be the empty string "".



AT#EUSER?

Read command returns the value of the current user identification string <e-user>, in the format:

#EUSER: <eUser>



AT#EUSER=?

Test command returns the maximum allowed length of the string parameter <eUser>



```
</> AT#EUSER="myE-Name"  
OK  
  
AT#EUSER?  
#EUSER: "myE-Name"  
OK
```



## AT#EMAILD - E-mail Sending

This command sends an e-mail message.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



**AT#EMAILD=[<da>,<subj>]**

A PDP context shall have been activated through AT#SGACT=x,1. The context "x" is the one used by SMTP, as specified by #SMTPCFG command. After command line is terminated with <CR>, the device responds sending a four character sequence prompt:

<CR><LF><greater\_than><space> (see IRA character set: 13, 10, 62, 32)

To complete the operation, send Ctrl-Z char (0x1A hex). To exit without completing the operation send ESC char (0x1B hex).

If the e-mail message is successfully sent, then the response is OK. If message sending fails for some reason, an error code is reported.

Parameters:

Name	Type	Default	Description
<da>	string	-	destination address (maximum length 100 characters).
<subj>	string	-	subject of the message (maximum length 100 characters).

- ✦ If the length of one of the string type parameters exceeds the maximum length, then module returns an error indication.
- ✦ Care must be taken to ensure that during the command execution, no other commands are issued: to avoid malfunctions it is suggested to wait for the OK or ERROR / +CMS ERROR:<err> response before issuing further commands.
- ✦ Maximum length for message body is 1500: trying to send more data will cause the surplus to be discarded and lost.



**AT#EMAILD=?**

Test command returns OK result code.



```
</> AT#EMAILD="me@myaddress.com","subject of the mail"  
>message body... . This is the text of the mail message  
CTRL-Z  
... wait...  
OK  
Message has been sent.
```





## AT#EPASSW - E-mail Authentication Password

This command sets the password string to be used during the authentication step of the SMTP.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#EPASSW=[<ePwd>]

Parameter:

Name	Type	Default	Description
<ePwd>	string	""	e-mail authentication password that can have any string value up to max length reported by test command
Value:			
<div> <div>""</div> <div>:</div> <div>factory default</div> </div>			



If no authentication is required then the <ePwd> parameter shall be empty "".



AT#EPASSW=?

Test command returns the maximum allowed length of the string parameter <ePwd>.



AT#EPASSW="myPassword"  
OK



## AT#EADDR - E-mail Sender Address

This command sets the sender address string to be used for sending the e-mail.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT#EADDR=[<eAddr>]**

Parameter:

Name	Type	Default	Description
<eAddr>	string	""	sender address. This parameter can be set to any string with any length up to the one reported by the test command.
Value:			
<div> <div>""</div> <div>:</div> <div>default value</div> </div>			



**AT#EADDR?**

Read command reports the current sender address, in the format:

#EADDR: <eAddr>



**AT#EADDR=?**

Test command returns the maximum allowed length of the string parameter <eAddr>.



The examples describe how to set and get the sender e-mail address.

- Set the sender e-mail address.  
AT#EADDR="me@email.box.com"  
OK
- Get sender e-mail address.  
AT#EADDR?



```
#EADDR: "me@email.box.com"
```

```
OK
```



# HTTP



## AT#HTTPCFG - Configure HTTP Parameters

This command sets the parameters needed to the HTTP connection.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No

➡ AT#HTTPCFG=<prof\_id>[,<server\_address>[,<server\_port>[,<auth\_type>[,<username>[,<password>[,<ssl\_enabled>[,<timeout>[,<cid>[,<pkt\_size>[,<unused1>[,<unused2>]]]]]]]]]]]

Parameters:

Name	Type	Default	Description
<prof_id>	integer	N/A	select the profile identifier.
Value: <div> 0÷2 : Profile identifier </div>			
<server_address>	string	-	IP address of the HTTP server. This parameter can be either: <ul style="list-style-type: none"> <li>- any valid IP address in the format: "xxx.xxx.xxx.xxx"</li> <li>- any valid IPv6 address in one of the following format: "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" </li> <li>- any host name to be solved with a DNS query. Default: "" for first and second profile "m2mlocate.telit.com" for third profile </li> </ul>
<server_port>	integer	N/A	select TCP remote port.



			for first and second profile 80, by default for third profile 9978, by default	
		Value:		
		.....		
		1÷65535	: TCP remote port of the HTTP server to connect to	
		.....		
<auth_type>	integer	0	select HTTP authentication type.	
		Values:		
		.....		
		0	: no authentication	
		1	: basic authentication	
		.....		
<username>	string	-	configure authentication user identification string for HTTP.	
<password>	string	-	configure authentication password string for HTTP.	
<ssl_enabled>	integer	0	enable/disable SSL encryption.	
		Values:		
		.....		
		0	: SSL encryption disabled	
		1	: SSL encryption enabled	
		.....		
<timeout>	integer	120	timeout, data from HTTPS server.	
		Value:		



		1÷65535	:	time interval in seconds to wait for receiving data from HTTP server.
<hr/>				
<cid>	integer	-		PDP context identifier. See +CGDCONT command.
<pkt_size>	integer	1500		size for data sending (#HTTPSND) or receiving (#HTTPRCV).
<hr/>				
Values:				
<hr/>				
0				
:				
select automatically default value				
1÷1500				
:				
send or receive size in bytes				
<hr/>				
<unused1>	integer	-		parameter for future use. Must be set to 0.
<unused2>	integer	-		parameter for future use. Must be set to 0.

✦ A special form of the set command, AT#HTTPCFG=<prof\_id>, causes the values for profile number <prof\_id> to reset to default values.

✦ Only one profile can use the SSL encryption.

#### 🔍 AT#HTTPCFG?

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

```
#HTTPCFG:<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,<pkt_size>,0,0<CR><LF>[<CR><LF>
```

```
#HTTPCFG:<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,<pkt_size>,0,0<CR><LF>[...]]
```



## ? AT#HTTPCFG=?

Test command returns the supported range of parameters <prof\_id>, <server\_port>, <auth\_type>, <ssl\_enabled>, <timeout>, <cid>, <pkt\_size>, <unused1>, <unused2>, and the maximum length of <server\_address>, <username> and <password> parameters in the format:

#HTTPCFG:(list of supported <prof\_id>s),<s\_length>,(list of supported <server\_port>s), (list of supported <auth\_type>s),<u\_length>,<p\_length>,(list of supported <ssl\_enabled>s),(list of supported <timeout>s),(list of supported <cid>s),(list of supported <pkt\_size>s),(0),(0)

Additional info:

►► Meaning of the <...\_length> parameters:

Name	Type	Default	Description
<s_length>	integer	-	maximum length of parameter <server_address>
<u_length>	integer	-	maximum length of parameter <username>.
<p_length>	integer	-	maximum length of parameter <password>.





## AT#HTTPQRY - Send HTTP GET, HEAD or DELETE Request

This command performs a GET, HEAD or DELETE request to HTTP server.



Standard RFC 2616

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#HTTPQRY=<prof\_id>,<command>,<resource>[,<extra\_header\_line>]

Parameters:

Name	Type	Default	Description
<prof_id>	integer	N/A	profile identifier
Value:  0÷2 : identifier values			
<command>	integer	0	identifies command requested to HTTP server
Values:  0 : GET 1 : HEAD 2 : DELETE			



<resource>	string	-	is the HTTP resource (URI), object of the request. It must always start with "/" (slash character)
<extra_header_line>	string	-	is the optional HTTP header line

Additional info:

- When the HTTP server answer is received, then the following URC is put on the serial port:

#HTTPRING: <prof\_id>,<http\_status\_code>,<content\_type>,<data\_size>

If there are no data from server or the server does not answer within the time interval specified in <timeout> parameter of #HTTPCFG command, then the URC #HTTPRING <http\_status\_code> parameter has value 0.

Name	Type	Default	Description
<http_status_code>	string	-	is the status code, as received from the server, see RFC 2616
<content_type>	string	-	reports the "Content-Type" header line, as received from the server, see RFC 2616. This field is empty if <http_status_code> has a value out of range (200-206)
<data_size>	string	-	is the byte amount of data received from the server. If the server does not report the "Content-Length:" header line, or <http_status_code> has a value out of range (200-206), the parameter value is 0.

- To set more than one HTTP header line in parameter <extra\_header\_line>, they have to be separated by ">>"



Example:

```
AT#HTTPORY=0,0,"myURI","Content-Type: xyz">>Authorization: something"
```

Where:

"myURI" must always start with "/" (slash).

Here an example where #HTTPORY requests for the homepage of www.myhost.com:

```
AT#HTTPOCFG=0,"www.myhost.com",80
```

```
OK
```

```
AT#HTTPORY=0,0,"/"
```

```
OK
```



If sending ends successfully, the response is OK; otherwise an error code is reported.

The HTTP request header sent with #HTTPORY always contains the "Connection: close" line, and it cannot be removed.



#### AT#HTTPORY=?

Test command reports the supported range of values for the parameters <prof\_id> and <command> and the maximum length of <resource> parameter in the format:

```
#HTTPORY:(list of supported <prof_id>s),(list of supported <command>s),<r_length>,<m_length>
```

Additional info:



Meaning of <...\_length> parameters:



Name	Type	Default	Description
<r_length>	integer	-	maximum length of parameter <resource>.
<m_length>	integer	-	maximum length of parameter <extra_header_line>.



## AT#HTTPSND - Send HTTP POST or PUT request

This command performs a POST or PUT request to HTTP server and starts sending data to the server.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#HTTPSND=<profId>,<command>,<resource>,<dataLen>[,<postParam>[,<extraHeaderLine>]]

After entering AT#HTTPSND=... command, and terminated the command line with <CR>, the module returns the following three characters sequence prompt, and waits for data to send:

<greater\_than><greater\_than><greater\_than> (see IRA character set: 62, 62, 62)

Now, data can be entered from TE, sized <dataLen> bytes. If sending ends successfully the response will be OK, otherwise an error code will be reported.

When the HTTP server answer is received, the URC will be available on the serial port with the following format:

#HTTPRING: <profId>,<httpStatusCode>,<contentType>,<dataSize>

The URC parameters are described in Unsolicited Field section.

Parameters:

Name	Type	Default	Description
<profId>	integer	N/A	profile identifier
Value:			
.....			
0÷2 : profile identifier			
.....			
<command>	integer	N/A	command requested to HTTP server




<p>Values:</p> <p>.....</p> <p>0 : POST command</p> <p>1 : PUT command</p> <p>.....</p>			
<resource>	string	-	HTTP resource (uri), object of the request
<dataLen>	integer	-	data length to send in bytes
<postParam>	string	N/A	HTTP Content-type identifier, used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier
<p>Values:</p> <p>.....</p> <p>0[:extension] : "application/x-www-form-urlencoded " with optional extension</p> <p>1[:extension] : "text/plain" with optional extension</p> <p>2[:extension] : "application/octet-stream" with optional extension</p> <p>3[:extension] : "multipart/form-data" with optional extension</p> <p>other : free string corresponding to other content type and possible sub-types</p> <p>.....</p>			




<extraHeaderLine>	string	-	optional HTTP header line
-------------------	--------	---	---------------------------

Unsolicited fields:

Name	Type	Description
<httpStatusCode>	integer	status code, as received from the server (see RFC 2616)
<contentType>	string	"Content-Type" header line, as received from the server (see RFC 2616)). This field is empty if <httpStatusCode> has a value out of range (200-206)
<dataSize>	integer	byte amount of data received from the server. If the server does not report the "Content-Length:" header line or <httpStatusCode> has a value out of range (200-206), the parameter value is 0.

 The HTTP request header sent with #HTTPSND always contains the "Connection: close" line, and it cannot be removed.

 If there are no data from server or the server doesn't answer within the time interval specified in <timeout> parameter of #HTTPCFG command, then the URC #HTTPRING <httpStatusCode> parameter will have value 0.



#### AT#HTTPSND=?

Test command returns the supported range of parameters <profId>, <command> and <dataLen> and the maximum length of <resource>, <postParam> and <extraHeaderLine> string parameters in the format:

# HTTPSND: (list of supported <profId>s),(list of supported <command>s), <rLength>,  
(list of supported <dataLen>s),<pLength>,<mLength>

Additional info:

▶▶ <...Length> parameters meaning:



Name	Type	Default	Description
<rLength>	integer	-	maximum length of parameter <resource>
<pLength>	integer	-	maximum length of parameter <postParam>
<mLength>	integer	-	maximum length of parameter <extraHeaderLine>



POST commands examples.

- Post 100 byte without "Content-type" header  
AT#HTTPSND=0,0,"/",100  
>>>
- Post 100 byte with "application/x-www-form-urlencoded"  
AT#HTTPSND=0,0,"/",100,0  
>>>
- Post 100 byte with "multipart/form-data" and extension  
AT#HTTPSND=0,0,"/",100,"3:boundary=----FormBoundary"  
>>>





## AT#HTTPTCV - Receive HTTP Server Data

This command permits the user to read data from HTTP server in response to a previous HTTP module request.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#HTTPTCV=<profilId>[,<maxByte>]

The module is notified of these data by the #HTTPTCV URC.

The device shall prompt a three-character sequence followed by the data:

<less\_than><less\_than><less\_than> (see IRA character set: 60,60,60)

If reading ends successfully, the response is OK; otherwise an error code is reported.

Parameters:

Name	Type	Default	Description
<profilId>	integer	N/A	profile identifier
Value:			
.....			
0÷2 : profile identifier			
.....			
<maxByte>	integer	0	max number of bytes to read at a time
Value:			
.....			
0, 64÷1500 : 0 means infinite size.			
.....			



- ✦ If <maxByte> is unspecified, server data will be transferred all in once.
- ✦ If the data are not present or the #HTTTPRING <statusCode> parameter has value 0, an error code is reported.



#### AT#HTTTPRCV=?

Test command reports the supported range of values for <profId> and <maxByte> parameters in the format:

# HTTTPRCV: (list of supported <profId>s,<maxByte>)



## AT#HTTTPRCVOTA - Receive and Store HTTP Server Data in FOTA

This command read data from a HTTP server and save it into the FOTA partition.

SIM Presence	Setting saved	Can be aborted
Required	No	Yes



**AT#HTTTPRCVOTA=<prof\_id>[,<verbose>]**

Execution command allows to read data from a HTTP server, in response to a previous HTTP module request, and to save it into module FOTA partition.

The module is notified of these data by the #HTTTPRING URC.

Parameters:

Name	Type	Default	Description
<prof_id>	integer	N/A	numeric parameter indicating the profile identifier
Value: <div> <div>0÷2</div> <div>:</div> <div>profile identifier</div> </div>			
<verbose>	integer	0	enable/disable verbose mode
Value: <div> <div>0</div> <div>:</div> <div>disable</div> </div> <div> <div>1</div> <div>:</div> <div>enable</div> </div>			





When verbose mode is enabled, i.e. <verbose> is set to 1, the "#" character is printed on the AT command port for every 4096 bytes written into the FOTA partition



AT#HTTPRCVOTA=?

Test command reports the range of supported values for parameters in the format:

# HTTPRCVOTA:<prof\_id> (list of supported <prof\_id>s),<verbose> (list of supported <verbose>s)



# SSL



## AT#SSLCFG - Configure General Parameters of a SSL Socket

This command configures SSL connection parameters.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No

AT#SSLCFG=<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>[,<SSLSRingMode>[,<noCarrierMode>[,<skipHostMismatch>[,<equalizeTX>[,<connTo>[,<Unused1>]]]]]]

Set command allows configuring SSL connection parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
.....			
1÷10 : Secure Socket Identifier			
.....			
<cid>	integer	-	PDP context identifier, see +CGDCONT command.
<pktSz>	integer	0	packet size to be used by the SSL/TCP/IP stack for data sending
Values:			
.....			
0 : select automatically default value (300)			
1÷1500 : number of bytes			
.....			



<maxTo>	integer 90	exchange timeout or socket inactivity timeout. In online mode, if there is no data exchange within this timeout period, the connection is closed.
Values: ..... 0 : no timeout 1÷65535 : timeout in seconds .....		
<defTo>	integer 100	timeout that will be used by default whenever the corresponding parameter of each command is not set.
Value: ..... 10÷5000 : timeout in tenth of seconds .....		
<txTo>	integer 50	data sending timeout. In online mode, after this period data are sent also if they're less than max packet size.
Values: ..... 0 : no timeout 1÷255 : timeout value in hundreds of milliseconds .....		



<SSLSRingMode>	integer	0	SSLRING unsolicited mode
Values: ..... 0 : disable  1 : enable decoded data format, see Additional info section  2 : enable chunk of data format, see Additional info section .....			
<noCarrierMode>	integer	0	selects the NO CARRIER indication format when the secure socket is closed.
Values: ..... 0 : NO CARRIER without additional information  1 : NO CARRIER:SSL,<SSId> See Additional info section  2 : NO CARRIER:SSL,<SSId>,<cause> See Additional info section .....			
<skipHostMismatch>	integer	1	enables/disables Host Mismatch alert
Values: ..... 0 : do not ignore  1 : ignore .....			





<equalizeTX>	integer 0	enable/disable equalized data transmission
Values: ..... 0 : disable equalized data transmission  1 : enable equalized data transmission, i.e.: after successful data write for sending on SSL connection, next check for available <pktSz> data is triggered after <txTo> .....		
<connTo>	integer 0	Connection timeout in tenths of seconds.  If the SSL connection to the remote cannot be established within this timeout period, an error is raised.
Values: ..... 0 : the timeout is managed by TCP/IP and SSL stack  10÷1200 : timeout value .....		
<Unused1>	integer -	parameter for future use. Must be set to 0.

Additional info:

- When <SSLSRingMode>= 1 a new unsolicited is sent whenever the amount of data ready to be read changes, the unsolicited format is:



SSLSRING: <SSId>,<recData>

<recData> is described in the Unsolicited fields section.

►► When <SSLSRingMode>= 2 the unsolicited format is:

SSLSRING: <SSId>,<dataLen>,<data>

<dataLen> and <data> are described in the Unsolicited fields section.

►► The NO CARRIER indication can be followed by additional information:

NO CARRIER:SSL,<SSId>

NO CARRIER:SSL,<SSId>,<cause>

The fixed "SSL" string distinguishes secure sockets from TCP sockets.

Name	Type	Default	Description
<cause>	integer	N/A	cause of the secure socket closure
Values: <div> <div>0</div> <div>:</div> <div>not available (secure socket has not yet been closed)</div> </div> <div> <div>1</div> <div>:</div> <div>the remote TCP connection has been closed (RST, or any fatal error in send/rcv are all included within this case)</div> </div> <div> <div>2</div> <div>:</div> <div>socket inactivity timeout</div> </div>			



- 3 : network deactivation (PDP context deactivation from network)
- 4 : SSL "Close Notify Alert" message has been received
- 5 : the remote TCP connection has been closed (FIN) after all data have been retrieved from socket
- 6 : closure due to any other SSL alert different from the previous ones

#### Unsolicited fields:

Name	Type	Description
<recData>	integer	number of bytes available to be read from the TLS/SSL record that is currently being processed (obviously: already decoded from TLS/SSL record) plus the number of bytes available to be read in the TCP/IP stack.
<dataLen>	integer	length of the current chunk of data in bytes
<data>	hex	received data in ASCII format



If secure socket is not enabled using #SSLEN only test requests can be made.



This version of command reordered the parameters of the command, so this is not interchangeable with previous version

#### AT#SSLCFG?

Read command reports the parameters current values in the format:



#SSLCFG:<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>,<SSLSRingMode>,<noCarrierMode>,<skipHostMismatch>,<equalizeTX>,<connTo>,0
---

AT#SSLCFG=?
-------------

Test command reports the ranges of all parameters values.
---



## AT#SSLSECCFG - Configure Security Parameters of a SSL Socket

This command allows configuring SSL connection parameters.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SSLSECCFG=<SSId>,<CipherSuite>,<auth\_mode>[,<cert\_format>]

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value: <div> <div>1÷10</div> <div>:</div> <div>Secure Socket Identifier</div> </div>			
<CipherSuite>	integer	0	<p>identify the cipher suite. The &lt;CipherSuite&gt; parameter is expressed in decimal and hex format to identify different cipher suites.</p> <p>The cipher suites identified by &lt;CipherSuite&gt; parameters expressed in decimal format are listed in the Value section right below.</p> <p>The cipher suites identified by &lt;CipherSuite&gt; (RCF) values expressed in hex format are listed in the Additional info section.</p>



Values:

- 
- 0 : cipher suite by remote server; see additional info section
  - 1 : TLS\_RSA\_WITH\_RC4\_128\_MD5, not available because obsolete
  - 2 : TLS\_RSA\_WITH\_RC4\_128\_SHA, not available because obsolete
  - 3 : TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA
  - 4 : TLS\_RSA\_WITH\_NULL\_SHA, not available because obsolete
  - 5 : TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA
  - 6 : TLS\_RSA\_WITH\_3DES\_EDE\_CBC\_SHA, not available because obsolete
  - 7 : TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA
  - 8 : TLS\_DHE\_RSA\_WITH\_3DES\_EDE\_CBC\_SHA, not available because obsolete
  - 9 : TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA
  - 10 : TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256
  - 11 : TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256
  - 12 : TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256
  - 13 : TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA256
- 

<code>&lt;auth_mode&gt;</code>	integer	0	authentication mode
--------------------------------	---------	---	---------------------

Values:



0 : SSL Verify None  1 : manage server authentication  2 : manage server and client authentication if requested by the remote server		
<cert_format>	integer 1	Select the format of the certificate to be stored via #SSLSECDATA command.
Values:  0 : DER format  1 : PEM format		

#### Additional info:

- With <CipherSuite> =0 cipher suite is chosen by remote server among the following:

##### TLS 1.2:

TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_GCM\_SHA256,  
TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_GCM\_SHA384,  
TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_GCM\_SHA256,  
TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_GCM\_SHA384,  
TLS\_ECDHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256,  
TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384,  
TLS\_ECDH\_RSA\_WITH\_AES\_128\_GCM\_SHA256,  
TLS\_ECDH\_RSA\_WITH\_AES\_256\_GCM\_SHA384,  
TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA,



TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA,  
 TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA,  
 TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA,  
 TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256,  
 TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256,  
 TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256,  
 TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA256

#### TLS 1.3:

TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_GCM\_SHA256,  
 TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_GCM\_SHA384,  
 TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_GCM\_SHA256,  
 TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_GCM\_SHA384,  
 TLS\_ECDHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256,  
 TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384,  
 TLS\_ECDH\_RSA\_WITH\_AES\_128\_GCM\_SHA256,  
 TLS\_ECDH\_RSA\_WITH\_AES\_256\_GCM\_SHA384,  
 TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA,  
 TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA,  
 TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA,  
 TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA,  
 TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256,  
 TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256,  
 TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256,  
 TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA256,  
 TLS\_AES\_128\_GCM\_SHA256,  
 TLS\_AES\_256\_GCM\_SHA384,  
 TLS\_CHACHA20\_POLY1305\_SHA256

►► The first column shows the <CipherSuite> (RCF) values expressed in hex format,  
 the second column indicates the related cipher suite name.






0x002F	:	TLS_RSA_WITH_AES_128_CBC_SHA
0x0033	:	TLS_DHE_RSA_WITH_AES_128_CBC_SHA
0x0035	:	TLS_RSA_WITH_AES_256_CBC_SHA
0x0039	:	TLS_DHE_RSA_WITH_AES_256_CBC_SHA
0x003C	:	TLS_RSA_WITH_AES_128_CBC_SHA256
0x003D	:	TLS_RSA_WITH_AES_256_CBC_SHA256
0x0067	:	TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
0x006B	:	TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
0x008A	:	TLS_PSK_WITH_RC4_128_SHA
0x008B	:	TLS_PSK_WITH_3DES_EDE_CBC_SHA
0x008C	:	TLS_PSK_WITH_AES_128_CBC_SHA
0x008D	:	TLS_PSK_WITH_AES_256_CBC_SHA
0x009C	:	TLS_RSA_WITH_AES_128_GCM_SHA256
0x009D	:	TLS_RSA_WITH_AES_256_GCM_SHA384
0x009E	:	TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
0x009F	:	TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
0x00A8	:	TLS_PSK_WITH_AES_128_GCM_SHA256
0x00A9	:	TLS_PSK_WITH_AES_256_GCM_SHA384
0x00AE	:	TLS_PSK_WITH_AES_128_CBC_SHA256
0x00AF	:	TLS_PSK_WITH_AES_256_CBC_SHA384
0xC004	:	TLS_ECDH_ECDSA_WITH_AES_128_CBC_SHA
0xC005	:	TLS_ECDH_ECDSA_WITH_AES_256_CBC_SHA
0xC009	:	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
0xC00A	:	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
0xC00E	:	TLS_ECDH_RSA_WITH_AES_128_CBC_SHA
0xC00F	:	TLS_ECDH_RSA_WITH_AES_256_CBC_SHA
0xC013	:	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
0xC014	:	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
0xC023	:	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
0xC024	:	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384
0xC025	:	TLS_ECDH_ECDSA_WITH_AES_128_CBC_SHA256
0xC026	:	TLS_ECDH_ECDSA_WITH_AES_256_CBC_SHA384
0xC027	:	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
0xC028	:	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
0xC029	:	TLS_ECDH_RSA_WITH_AES_128_CBC_SHA256
0xC02A	:	TLS_ECDH_RSA_WITH_AES_256_CBC_SHA384
0xC02B	:	TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
0xC02C	:	TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
0xC02D	:	TLS_ECDH_ECDSA_WITH_AES_128_GCM_SHA256
0xC02E	:	TLS_ECDH_ECDSA_WITH_AES_256_GCM_SHA384
0xC02F	:	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
0xC030	:	TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
0xC031	:	TLS_ECDH_RSA_WITH_AES_128_GCM_SHA256
0xC032	:	TLS_ECDH_RSA_WITH_AES_256_GCM_SHA384
0xC0A0	:	TLS_RSA_WITH_AES_128_CCM_8
0xC0A1	:	TLS_RSA_WITH_AES_256_CCM_8
0xC0A2	:	TLS_DHE_RSA_WITH_AES_128_CCM_8
0xC0A3	:	TLS_DHE_RSA_WITH_AES_256_CCM_8




```

0xCCA8 : TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
0xCCA9 : TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
0xCCAA : TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256
0x1301 : TLS_AES_128_GCM_SHA256
0x1302 : TLS_AES_256_GCM_SHA384
0x1303 : TLS_CHACHA20_POLY1305_SHA256
0x1304 : TLS_AES_128_CCM_SHA256
0x1305 : TLS_AES_128_CCM_8_SHA256

```


 Server CA certificate must be stored through #SSLSECDATA.


 If the module is just powered on and the AT#SSLSECCFG command is entered without <cert\_format> parameter, then the default format is PEM.


In this case the AT#SSLSECCFG? read command does not return the setting of the format in order to meet backwards compatibility with other families.

Now, assuming that AT#SSLSECCFG command is entered again, but using the <cert\_format> parameter for the first time: if the read command is entered, it reports the parameter value just used.

If subsequently the <cert\_format> is omitted, then the AT#SSLSECCFG? read command reports the parameter value entered the last time.

 Setting an obsolete cipher suite have the same effect as setting it to 0.

 If secure socket is not enabled using #SSLEN command, only test command can be used.

 If <auth\_mode> is different from 0, the module uses its internal time and date to validate the certificate validity period.

If time and date are incorrectly set, the certificate validation may fail. For additional information refer to AT+CCLK, AT#NITZ or AT#NTP.



AT#SSLSECCFG?

Read command reports the currently selected parameters in the format:



#SSLSECCFG: <SSId>,<CipherSuite>,<auth\_mode>,<cert\_format>

Read command returns ERROR if secure socket has not been enabled using #SSLEN command.



AT#SSLSECCFG=?

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



# AT#SSLSECCA - Manage the Security Data

This command stores, reads, and deletes CA Certificates in / from NVM.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SSLSECCA=<CertId>,<action>,<dataType>[,<size>[,<Unused\_A>[,<Unused\_B>]]]

Parameters:

Name	Type	Default	Description
<CertId>	integer	1	Certificate Identifier
Values: <div> <div>1</div> <div>:</div> <div>Certificate Identifier 1</div> </div> <div> <div>2</div> <div>:</div> <div>Certificate Identifier 2</div> </div> <div> <div>3</div> <div>:</div> <div>Certificate Identifier 3</div> </div>			
<action>	integer	0	required action
Values: <div> <div>0</div> <div>:</div> <div>delete data from NVM</div> </div> <div> <div>1</div> <div>:</div> <div>store data in NVM</div> </div> <div> <div>2</div> <div>:</div> <div>read data from NVM</div> </div>			



<dataType>	integer	1	security data type
Value:			
.....			
1 : CA certificate			
.....			
<size>	integer	N/A	size of security data to be stored; the parameter is mandatory if write action is issued, it can be omitted for delete or read actions.
Value:			
.....			
1÷4095 : size of security data to be stored			
.....			

Additional info:

## ►► Store security data in NVM

<action>=1 specifies the storing in NVM, <size> parameter is mandatory. After command line is terminated with <CR>, the command returns the following four-characters sequence prompt:

<CR><LF><greater\_than><space> (see IRA 13, 10, 62, 32)

and waits for data to be stored. Security data must be in PEM format:

to end the secured data editing, enter Ctrl-Z char (0x1A hex)

to exit without writing the message, enter ESC char (0x1B hex)

If data are successfully stored, the command returns OK, otherwise an error code is reported.

## ►► Read security data from NVM

<action>=2 specifies the reading from NVM, the <size> parameter is not mandatory. The command returns the following message:



```
#SSLSECCA: <CertId>,<dataType>
<DATA>
OK
```

## ►► Select which CA certificate to use

With AT#SSLSECCFG2 it is possible to select which CA certificate of <CertId> to use for the next SSL connection.

Maximum 3 certificate between <preloadedCA> and <customCA> must be selected.

- ✦ If secure socket has not been enabled through #SSLEN command, only test command can be used
- ✦ If socket is connected an error code is reported
- ✦ Only "rsa\_sign" certificates are supported by the Telit Module in client authentication.
- ✦ CA certificate stored in NVM  
CA certificates stored in NVM are shared among all secure sockets <SSId>s



## AT#SSLSECCA?

Read command reports what security data are stored for each <CertId>. The returned message has the following format:

```
#SSLSECCA: <CertId>,0,<CACertIsSet>,0,,0
```

```
#SSLSECCA: <CertId>,0,<CACertIsSet>,0,,0
```

<CACertIsSet> is 1 if related data are stored into NVM, 0 otherwise.

Additional info:



►► This Additional info section describes the parameters, if not described in the previous sections, returned by the AT#SSLSECCA? read command

Name	Type	Default	Description
<CAcertIsSet>	integer	0	identifies the CA certificate presence in the NVM
Values:			
0 : not present			
1 : present			



AT#SSLSECCA=?

Test command returns the supported values for the parameters <CertId>, <action>, <dataType> and <size>.



Store CA certificate 1 for www.site1.com for <CertId> 1

#SSLSECCA=1,1,1,<len>

>...

Store CA certificate 2 for www.site2.com for <CertId> 2

#SSLSECCA=2,1,1,<len>

>...

Set to use <CertId> 1 and 2

#SSLSECCFG2=1,4,0,3,0



>...

Connect

#SSLD=1,443,"www.site1.com",...

CONNECT

+++

OK

AT#SSLH=1

OK

Connect

#SSLD=2,443,"www.site2.com",...

CONNECT

+++

OK





## AT#SSLEN - Enable a SSL Socket

This command activates/deactivates a socket secured by SSL.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SSLEN=<SSId>,<Enable>



Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
.....			
1÷10	:	Secure Socket Identifier	
.....			
<Enable>	integer	0	activate/deactivate secure socket
Values:			
.....			
0	:	deactivate	
.....			
1	:	activate	
.....			



If the unique available secure socket is not activated, all the commands - belonging to the SSL set (example: #SSLSECDATA, #SSL..., etc.) and different from test commands - return an error message. #SSLS command is an exception, it can be issued also if the socket is deactivated.



-  If the unique available secure socket is connected, it cannot be deactivated issuing AT#SSLEN=1,0.
-  <SSId> 1 is shared with #HTTP(S) and #FTP(S) and only one application can use the same instance at a given time.  
If one of these two applications has SSL enabled, AT#SSLEN=1,1 will return an Error



#### AT#SSLEN?

Read command reports the current status of secure socket in the format:

#SSLEN: <SSId>,<Enable>  
OK



#### AT#SSLEN=?

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

#SSLEN: (1-10),(0,1)



## AT#SSLD - Open a SSL Socket to a Remote Server

This command opens a remote connection via socket secured through SSL.

SIM Presence	Setting saved	Can be aborted
Required	Other	No



**AT#SSLD=<SSId>,<rPort>,<IPAddress>,<ClosureType>[,<connMode>[,<Timeout>]]**

Execution command opens a remote connection via socket secured through SSL.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
.....			
1÷10 : Secure Socket Identifier			
.....			
<rPort>	integer	1	Remote TCP port to contact
Value:			
.....			
1÷65535 : TCP port number			
.....			
<IPAddress>	string	-	address of SSL server.
<ClosureType>	integer	0	Closure type
Value:			
.....			
0 : Until now only closure type 0 is supported. SSL session id and keys are free.			
.....			
<connMode>	integer	1	connection mode



#### Values:

- .....
- 0 : online mode connection, see Additional info section.
- 1 : command mode connection, see Additional info section.
- .....

<Timeout>	integer	100	<p>It represents the maximum allowed TCP inter-packet delay. It means that, when more data is expected during the handshake, the module awaits &lt;Timeout&gt; * 100 msec for the next packet. If no more data can be read, the module gives up the handshake and raises an ERROR response.</p> <p>&lt;Timeout&gt; is the total handshake timeout or, in other words, it is not the absolute maximum time between the #SSLD issue and the CONNECT/OK/ERROR response. Though by changing this parameter you can limit the handshake duration (for example in case of congested network or busy server), there is no way to be sure to get the command response within a certain amount of time, because it depends on the TCP connection time, the handshake time and the computation time (which depends on the authentication mode and on the size of keys and certificates).</p>
-----------	---------	-----	--

#### Value:

.....

1÷5000 : hundreds of ms

.....

#### Additional info:

▶▶ <connMode>=0: online mode connection



If <connMode> is set to online mode connection and the command is successful, the module enters into online data mode and returns the intermediate result code CONNECT. After the CONNECT, you can suspend the direct interface to the socket connection (the socket stays open) using the escape sequence (+++): the module moves back to command mode and returns the final result code OK after the suspension.

After such a suspension, it is possible to resume it by using the #SSLO command with the corresponding <connId>.

#### ►► <connMode>=1: command mode connection

If <connMode> is set to command mode connection and the command is successful, the socket is opened, the module remains in command mode and returns result code OK.

- ✦ If secure socket is not enabled using #SSLEN only test requests can be made.
- ✦ If timeout is not set for SSL connection the default timeout value, set by #SSLCFG, is used.
- ✦ In online mode the socket is closed after an inactivity period (configurable with #SSLCFG, with a default value of 90 seconds), and the NO CARRIER message is printed.
- ✦ In online mode data are transmitted as soon as the data packet size is reached or as after a transmission timeout. Both these parameters are configurable by using #SSLCFG.
- ✦ Before opening a SSL connection, the PDP context must have been activated by #SGACT=x,1
- ✦ Before opening a SSL connection, make sure to have stored the needed secure data (CA certificate), using #SSLSECDATA, for the security level set through AT#SSLSECCFG.
- ✦ The PDP context definition that will be used, is set by AT#SSLCFG command



#### AT#SSLD=?

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

#SSLD: (1-10),(1-65535),,(0),(0,1),(1-5000)





See the following examples:

- Start online mode:  
AT#SSLD =1,8500,"84.94.194.21",0,1  
OK  
CONNECT
- Start command mode:  
AT#SSLD=1,8500,"84.94.194.21",1,1  
OK
- Configure correct PDP context with AT#SSLCFG command:  
AT#SGACT=3,1  
#SGACT: XX.XXX.XXX.XXX  
OK  
Note the second parameter of #SSLCFG  
AT#SSLCFG=1,3,300,90,100,50,0,0,0,0  
OK  
AT#SSLD=1,<port>,"IP or URL",0,1  
OK  
CONNECT



## AT#SSLO - Restore a SSL Socket after a +++

This command restores a SSL connection (online mode) suspended by an escape sequence (+++).

SIM Presence	Setting saved	Can be aborted
Not required	No	No






### AT#SSLO=<SSId>

This command restores a SSL connection (online mode) suspended by an escape sequence (+++). After the connection restore, the CONNECT message is printed. Please note that this is possible even if the connection has been started in command mode (#SSLD with <connMode>=1).

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
<div> <div>1÷10</div> <div>:</div> <div>Secure Socket Identifier</div> </div>			

-  If secure socket has not be enabled through #SSLEN command, only test command can be used.
-  Before opening a SSL connection, the PDP context must have been activated by AT#SGACT=X,1.
-  If an error occurs during reconnection the socket cannot be reconnected, then a new connection has to be done.



### AT#SSLO=?

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

#SSLO: (1-10)



## AT#SSLH - Close a SSL Socket

This command allows closing the SSL connection.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#SSLH=<SSId>[,<ClosureType>]**

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1÷10 : Secure Socket Identifier			
<ClosureType>	integer	0	type of socket closure.
Value:			
0 : only value 0 is supported			

If secure socket has not be enabled through #SSLEN command, only test command can be used.



**AT#SSLH=?**

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

#SSLH: (1-10),(0)





## AT#SSLSEND - Send Data through a SSL Socket

This command allows sending data through a secure socket.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#SSLSEND=<SSId>[,<Timeout>]**

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1÷10 : Secure Socket Identifier			
<Timeout>	integer	100	socket send timeout
Value:			
1÷5000 : timeout in 100 ms units			

Additional info:

- ▶▶ After command line is terminated with <CR>, the command returns the following four-character sequence prompt:  
 <CR><LF><greater\_than><space> (IRA 13, 10, 62, 32)  
 and waits for the data to be send.  
 to end the data editing and start the sending, enter Ctrl-Z char (0x1A hex). The maximum number of bytes to send is 1023, trying to send more data will cause the data excess to be discarded and lost.  
 to exit without sending the message, enter ESC char (0x1B hex).



If data are successfully sent, the command returns OK. If data sending fails, an error code is reported.

If secure socket has not be enabled through #SSLEN command, only test command can be used.

✦ If timeout is not set for SSL connection, is used the timeout value set by #SSLCFG.

✦ Before sending data through the SSL connection, it must be established using #SSLD.



AT#SSLSEND=?

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



# AT#SSLRCV - Read Data from a SSL Socket

This command reads data from a SSL socket.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#SSLRCV=<SSId>,<MaxNumByte>[,<Timeout>]

Set command allows to receive data, arrived through a connected secure socket. Data has been buffered and not read yet.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1÷10 : Secure Socket Identifier			
<MaxNumByte>	integer	N/A	maximum number of bytes to read
Value:			
1÷1000 : maximum number of bytes to read			
<Timeout>	integer	100	time-out in 100 ms units
Value:			



1÷5000 : hundreds of ms

Additional info:

▶▶ If data are received, the device responds:

```
#SSLRECV: NumByteRead
...(Data read)...
OK
```

▶▶ If no data are received, the device responds:

```
#SSLRECV: 0
TIMEOUT
OK
```

▶▶ If the remote host closes the connection, the device responds:

```
#SSLRECV: 0
DISCONNECTED
OK
```

✚ If secure socket is not enabled using AT#SSLEN, only test requests can be made.

✚ If timeout is not set for SSL connection, the default timeout value, set through AT#SSLCFG, is used.

✚ Before receiving data from the SSL connection, it has to be established using AT#SSLD.





AT#SSLRECV=?

The test command returns the ranges of the parameters values in the form:

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



# AT#SSLS - Report the Status of a SSL Socket

This command reports the status of secure sockets.

SIM Presence	Setting saved	Can be aborted
Required	No	No

AT#SSLS=<SSId>

The command reports the status of secure sockets. The response message of the command can have the following formats:

if secure socket is connected, the format is:  
 #SSLS: <SSId>,<ConnectionStatus>,<CipherSuite>

otherwise:  
 #SSLS: <SSId>,<ConnectionStatus>

The response messages parameters are described in the Additional info section.

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
<div> <div>1÷10</div> <div>:</div> <div>Secure Socket Identifier</div> </div>			

Additional info:

- » List of the meaning of the response message parameters.



Name	Type	Default	Description
<CipherSuite>	integer	N/A	<p>identify the cipher suite. The &lt;CipherSuite&gt; parameter is expressed in decimal and hex format to identify different cipher suites.</p> <p>The cipher suites identified by &lt;CipherSuite&gt; parameters expressed in decimal format are listed in the Value section right below.</p> <p>The cipher suites identified by RCF values expressed in hex format are listed in the #SSLSECCFG command.</p>
<p>Values:</p> <hr/> <p>1 : TLS_RSA_WITH_RC4_128_MD5, not available because obsolete</p> <p>2 : TLS_RSA_WITH_RC4_128_SHA, not available because obsolete</p> <p>3 : TLS_RSA_WITH_AES_256_CBC_SHA, not available because obsolete</p> <p>4 : TLS_RSA_WITH_AES_128_CBC_SHA, not available because obsolete</p> <p>5 : TLS_RSA_WITH_AES_256_CBC_SHA</p> <p>6 : TLS_RSA_WITH_3DES_EDE_CBC_SHA, not available because obsolete</p> <p>7 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA</p>			






- |    |   |  |
|----|---|--|
| 8  | : | TLS_DHE_RSA_WITH_3DES_EDE_CBC_SHA,<br>not available because obsolete |
| 9  | : | TLS_DHE_RSA_WITH_AES_256_CBC_SHA                                     |
| 10 | : | TLS_RSA_WITH_AES_128_CBC_SHA256                                      |
| 11 | : | TLS_DHE_RSA_WITH_AES_128_CBC_SHA256                                  |
| 12 | : | TLS_RSA_WITH_AES_256_CBC_SHA256                                      |
| 13 | : | TLS_DHE_RSA_WITH_AES_256_CBC_SHA256                                  |

<code>&lt;ConnectionStatus&gt;</code>	integer	N/A	Connection Status identifier
---------------------------------------	---------	-----	------------------------------

Values:

- |   |   |                   |
|---|---|-------------------|
| 0 | : | socket disabled   |
| 1 | : | connection closed |
| 2 | : | connection open   |

-  This command can be issued even if the `<SSId>` is not enabled.
-  For `<CipherSuite>` values expressed in hex format, refer to `#SSLSECCFG` command
-  In case of error when reading the `<CipherSuite>` 0xffff is returned





AT#SSLS=?

Test command returns the ranges of the parameters values in format:

#SSLS: (1-10)

</>

- AT#SSLS=1  
#SSLS: 1,1  
OK
- AT#SSLS=1  
#SSLS: 1,2,5  
OK



## AT#SSLI - Secure Socket Info

This command is used to get information about secure socket data traffic.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



**AT#SSLI=<SSId>**

Execution command is used to get information about secure socket data traffic.  
The response is in the format:

#SSLI: <SSId>,<DataSent>,<DataRecv>,<PendingData>,<TCPConnWaitingAck>

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
<div> <div>1÷10</div> <div>:</div> <div>Secure Socket Identifier</div> </div>			

Additional info:

- Parameters returned by the response message and not described in the previous sections.

Name	Type	Default	Description
<DataSent>	integer	-	total amount (in bytes) of data sent to the TLS/SSL connection since the beginning of the connection itself (obviously: not yet encoded into TLS/SSL record)



	<div> <div>&lt;DataRecv&gt;</div> <div>integer -</div> <div>total number of bytes received from the TLS/SSL connection since the beginning of the connection itself (obviously: already decoded from TLS/SSL record)</div> </div>
	<div> <div>&lt;PendingData&gt;</div> <div>integer -</div> <div>number of bytes available to be read from the TLS/SSL record that is currently being processed (obviously: already decoded from TLS/SSL record) plus the number of bytes available to be read in the TCP/IP stack.</div> </div>
	<div> <div>&lt;TCPConnWaitingAck&gt;</div> <div>integer A</div> <div>indication of the underlying TCP socket condition, if there are TCP/IP packets sent but not yet acknowledged or not</div> </div>
	<div> <div>Values:</div> <div> <div>0 : no TCP/IP packets sent waiting for ack</div> <div>1 : TCP/IP packets sent waiting for ack</div> </div> </div>
<div> <div>?</div> <div>AT#SSLI=?</div> <div>Test command returns the range of supported values for all the parameters.</div> <div>#SSLI: (1-10)</div> </div>	



## AT#SSLSENDEXT - Send Data through a SSL Socket in Command Mode

This command sends data through a secure socket.

SIM Presence	Setting saved	Can be aborted
Not required	No	No

AT#SSLSENDEXT=<SSId>,<bytestosend>[,<Timeout>]

Execution command sends data through a secure socket.

After command line is terminated with <CR>, the command returns the following four-character sequence prompt:

<CR><LF><greater\_than><space> (see IRA 13, 10, 62, 32)

and waits for the data to be send.

When <bytestosend> bytes have been sent, the sending is automatically completed. If data are successfully sent, the command returns OK. If data sending fails, an error code is reported.

Parameters:

Name	Type	Default	Description
<SSId>	integer	N/A	Secure Socket Identifier
Value: <div> 1÷10 : Secure Socket Identifier </div>			
<bytestosend>	string	-	number of bytes to be sent. Refer to test command for range
<Timeout>	integer	100	time-out in 100 ms units.



Value:

1 ÷ 1500 : hundreds of ms.

If secure socket has not be enabled through #SSLEN command, only test command can be used.

- ✦ If timeout is not set for SSL connection, is used the timeout value set by #SSLCFG.
- ✦ Before sending data through the SSL connection, it must be established using #SSLD.
- ✦ All special characters are sent like a generic byte. For instance: 0x08 BS (Backspace) is sent through the socket, it does not delete the previous character.

AT#SSLSENDEXT=?

Test command returns the range of supported values for parameters <SSId>, <bytertosend> and <Timeout>.



Open the socket in command mode:  
AT#SSLD=1,443,<port>,"IP address",0,1  
OK

Send data specifying total number of bytes:  
AT#SSLSENDEXT=1,256,100  
>...



# AT#SSLSECDATA - Manage the Security Data

The command stores, reads, and deletes security data (Certificate, CA certificate, private key) in / from NVM.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No

AT#SSLSECDATA=<CertId>,<action>,<dataType>[,<size>[,<Password>[,<md5WhenReading>]]]

Parameters:

Name	Type	Default	Description
<CertId>	integer	1	Certificate Identifier.
Values:			
.....			
1 : Certificate identifier number 1			
2 : Certificate Identifier 2 (Only for CA certificate)			
3 : Certificate Identifier 3 (Only for CA certificate)			
4 : Certificate Identifier 4 (Only for CA certificate)			
.....			
<action>	integer	0	required action
Values:			
.....			
0 : delete data from NVM			



	1	:	store data in NVM
	2	:	read data from NVM
	3	:	store data in RAM
.....			
<dataType>	integer	0	security data type
Values:			
.....			
	0	:	certificate
	1	:	CA certificate
	2	:	RSA Private key. Private keys with password are not supported
.....			
<size>	integer	N/A	size of security data to be stored. The parameter is mandatory if write action is issued, can be omitted for delete or read actions.
Value:			
.....			
	1÷4096	:	size
.....			
<Password>	string	-	it allows to read RSA key when it valids. The max length of this value is 10. Only 1~9/a~z/A~Z characters are allowed. Default is the empty string.
<md5WhenReading>	integer	0	handling of RSA Private key reading when <action> is 2.



Values:

- |   |
|---|
| .....                                     |
| 0 : RSA Private key is displayed in clear |
| 1 : only RSA Private key MD5 is displayed |
| .....                                     |

Additional info:

## ►► Store security data in NVM or in RAM

<action>=1 or 3 specifies the storing in NVM or in RAM, <size> parameter is mandatory.

If you save the certificate with <md5WhenReading> = 1, when reading you will get the md5 of the key.

If you save the certificate with <md5WhenReading> = 0, you will get the the key in clear.

After command line is terminated with <CR>, the command returns the following four-character sequence prompt:

<CR><LF><greater\_than><space> (see IRA 13, 10, 62, 32)

If data are successfully stored, the command returns OK, otherwise an error code is reported.

## ►► Read security data from NVM

<action>=2 specifies the reading from NVM, the <size> and <md5WhenReading> parameters are not mandatory. If <md5WhenReading> is given, it is ignored.

The command returns the following message:

```
#SSLSECDATA: <CertId>,<dataType>
<DATA>
OK
```





If the required security data has not been stored in NVM (or it has been deleted) the response has the following format:

```
#SSLSECDATA: <CertId>,<dataType>
No data stored
OK
```

## ▶▶ Select which CA certificate to use

With AT#SSLSECCFG2 it is possible to select which CA certificate of <CertId> use for the next SSL connection.

Maximum 3 certificates between <preloadedCA> and <customCA> must be selected.

## ▶▶ Select certificate format

Secured data have to be in PEM or in DER format, depending on <cert\_format> chosen with #SSLSECCFG.

If no <cert\_format> has been specified with #SSLSECCFG, then PEM format is assumed.

PEM format (see #SSLSECCFG command): to complete the operation send Ctrl-Z char (0x1A hex); to exit without writing the message send ESC char (0x1B hex).

DER format (see #SSLSECCFG command): when <size> bytes are entered, the certificate is automatically stored; ESC or Ctrl-Z do not have any effect, because they are considered as possible octets contained in the certificate.



If secure socket has not be enabled through #SSELEN command, only test command can be used.



<size> parameter is mandatory if the <write> action is issued.



If socket is connected an error code is reported.



Once the <Password> is saved, changing password is not allowed. To reset <Password> use AT#SSLSECDATA=<CertId>,0,2.



Only "rsa\_sign" certificates are supported by the Telit Module in client authentication. The remote server must support this certificate type, otherwise the handshake will fail.





#### CA certificate stored in RAM

CA certificate is stored in RAM until the related secure socket is not closed.

Assume that a secure socket, that was using a CA certificate stored in RAM, has been closed. If the secure socket must be reopened with the same CA certificate, the certificate must be stored again in RAM through the `#SSLSECDATA` command with `<action>=3`.

The CA certificate storing in RAM is also permitted when secure sockets are already connected. The new CA certificate will take effect on next `#SSLD=<SSId>...` connection.



#### CA certificate stored in NVM

CA certificates stored in NVM are shared among all secure sockets `<SSId>s`

### AT#SSLSECDATA?

Read command reports what security data are stored for each `<CertId>`. The returned message has the following format:

#SSLSECDATA:

`<CertId>,<CertIsSet>,<CACertIsSet>,<PrivKeyIsSet>[,<PasswordIsSet>,<md5WhenReading>]`

#SSLSECDATA: `<CertId>,0,<CACertIsSet>,0[,0,<md5WhenReading>]`

`<CertIsSet>`, `<CACertIsSet>`, `<PrivKeyIsSet>` are 1 if related data are stored into NVM otherwise 0.

`<PasswordIsSet>` is 1 if password has been used to store the key.

Additional info:



This Additional info section describes the parameters, if not described in the previous sections, returned by the AT#SSLSECDATA? read command.

Name	Type	Default	Description
<code>&lt;CertIsSet&gt;</code>	integer	0	identifies the certificate presence in the NVM
Values:			



		<div> 0 : not present </div> <div> 1 : present </div>
<CAcertIsSet>	integer 0	identifies the CA certificate presence in the NVM
	Values:	<div> 0 : not present </div> <div> 1 : present </div>
<PrivKeyIsSet>	integer 0	identifies the RSA Private key presence in the NVM
	Values:	<div> 0 : not present </div> <div> 1 : present </div>
<div> AT#SSLSECDATA=? </div> <div> Test command returns the supported values for the parameters &lt;CertId&gt;, &lt;action&gt;, &lt;dataType&gt;, &lt;size&gt;, &lt;Password&gt; and &lt;md5WhenReading&gt;. </div>		



## Examples



Store CA certificate 1 for www.site1.com in RAM  
#SSLSECDATA=1,3,1,<len>  
>...

Connect #SSLD=1,443,"www.site1.com",...  
CONNECT  
+++  
OK

Store CA certificate 2 for www.site2.com in RAM  
#SSLSECDATA=1,3,1,<len>  
>...

Connect  
#SSLD=2,443,"www.site2.com",...  
CONNECT  
+++  
OK

Now, the socket 1 is closed by the remote side, or by the user (with #SSLH command)

To reopen socket 1, enter again #SSLSECDATA command for www.site1.com  
#SSLSECDATA=1,3,1,<len>  
>...

Connect  
#SSLD=1,443,"www.site1.com",...  
CONNECT  
+++  
OK

Now, the socket 2 is closed by the remote side, or by the user (with #SH command)

To reopen socket 2, enter again #SSLSECDATA command for www.site2.com  
#SSLSECDATA=1,3,1,<len>  
>...

Connect  
#SSLD=2,443,"www.site2.com",...



## AT#SSLSECCFG2 - Configure Additional Parameters of a SSL Socket

This command allows configuring additional SSL security parameters.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SSLSECCFG2=<SSId>,<version>,  
[<SNI>[,<CustomCA>[,<PreloadedCA>[,<MinVersion>]]]]

Parameters:

Name	Type	Default	Description
<SSId>	integer	N/A	Secure Socket Identifier
Value:			
1÷10 : SSL socket ID			
<version>	integer	4	select SSL/TLS protocol version
Values:			
0÷3 : protocol version TLSv1.2			
4 : protocol version TLSv1.3			
<SNI>	integer	0	enable/disable Service Name Indication
Values:			



		<div> <div>0</div> <div>:</div> <div>SNI disabled</div> </div> <div> <div>1</div> <div>:</div> <div>SNI enabled</div> </div>	
<CustomCA>	integer 1	mask indicating which CA certificate is used from AT#SSLSECDATA	
		<div>Values:</div> <div> <div>0</div> <div>:</div> <div>No CA certificate</div> </div> <div> <div>1</div> <div>:</div> <div>Use the CA Certificate 1</div> </div> <div> <div>2</div> <div>:</div> <div>Use the CA Certificate 2</div> </div> <div> <div>4</div> <div>:</div> <div>Use the CA Certificate 3</div> </div> <div> <div>8</div> <div>:</div> <div>Use the CA Certificate 4</div> </div>	
<PreloadedCA>	integer 1	mask indicating which CA certificate is used from AT#SSLSECCA	
		<div>Values:</div> <div> <div>0</div> <div>:</div> <div>No CA certificate</div> </div> <div> <div>1</div> <div>:</div> <div>Use the CA Certificate 1</div> </div> <div> <div>2</div> <div>:</div> <div>Use the CA Certificate 2</div> </div> <div> <div>4</div> <div>:</div> <div>Use the CA Certificate 3</div> </div>	



<MinVersion>	integer	1	Set the Minimum acceptable TLS version
--------------	---------	---	--

Values:

- |   |   |                          |
|---|---|--------------------------|
| 1 | : | protocol version TLSv1.0 |
| 2 | : | protocol version TLSv1.1 |
| 3 | : | protocol version TLSv1.2 |
| 4 | : | protocol version TLSv1.3 |

Additional info:

- ▶▶ Select which CA certificate to use  
Maximum 3 certificate between <PreloadedCA> and <CustomCA> must be selected at the same time.
- ▶▶ <MinVersion> must be minor or equal to <version>.



AT#SSLSECCFG2?

Read command reports the currently selected parameters in the format:

#SSLSECCFG2: <SSId>,<version>,<SNI>,< CustomCA >,< PreloadedCA >,<MinVersion>



If <version> and <MinVersion> were set using a value inside a range, the read command will report the higher value of the range with the same meaning.



Example: setting <version> to 0 will result in the read value 3.



AT#SSLSECCFG2=?

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



See the following examples:

- Set 1st and 2nd certificates of AT#SSLSECDATA and 3rd certificate from AT#SSLSECCA

```
AT#SSLSECCFG2 =1,4,0,3,4
```

```
OK
```

- Set 2nd, 3rd and 4th certificates of AT#SSLSECDATA and NO certificate from AT#SSLSECCA

```
AT#SSLSECCFG2 =1,4,0,14,0
```

```
OK
```





# AT#SSLSECCS - Configure Cipher Suites List

This command configures a list of cipher suites, used for secure sockets.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#SSLSECCS=<ListId>[,<Action>[,<CipherSuite>]]

Parameters:

Name	Type	Default	Description
<ListId>	integer	1	Cipher Suites list Identifier
Value: <div> 1 : Cipher Suites list Identifier (currently limited to 1) </div>			
<Action>	integer	N/A	command action if this parameter is omitted, it prints the current content of the list.
Values: <div> 0 : Remove &lt;CipherSuite&gt; from &lt;ListId&gt;  1 : Add &lt;CipherSuite&gt; to &lt;ListId&gt;  2 : Remove all cipher suites from &lt;ListId&gt;  3 : Add all supported cipher suites to &lt;ListId&gt;  4 : Reset &lt;ListId&gt; to the default set of cipher suites </div>			



<CipherSuite>	integer	-	Cipher Suite identifier
---------------	---------	---	-------------------------

The <CipherSuite> is identified by its RCF value and it is expressed in hex format. The range of supported values is available in the Additional info section

#### Additional info:

- The first column shows the <CipherSuite> (RCF) values expressed in hex format, the second column indicates the related cipher suite name.

0x002F : TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA  
0x0033 : TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA  
0x0035 : TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0x0039 : TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0x003C : TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0x003D : TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256  
0x0067 : TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0x006B : TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA256  
0x008A : TLS\_PSK\_WITH\_RC4\_128\_SHA  
0x008B : TLS\_PSK\_WITH\_3DES\_EDE\_CBC\_SHA  
0x008C : TLS\_PSK\_WITH\_AES\_128\_CBC\_SHA  
0x008D : TLS\_PSK\_WITH\_AES\_256\_CBC\_SHA  
0x009C : TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
0x009D : TLS\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
0x009E : TLS\_DHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
0x009F : TLS\_DHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
0x00A8 : TLS\_PSK\_WITH\_AES\_128\_GCM\_SHA256  
0x00A9 : TLS\_PSK\_WITH\_AES\_256\_GCM\_SHA384  
0x00AE : TLS\_PSK\_WITH\_AES\_128\_CBC\_SHA256  
0x00AF : TLS\_PSK\_WITH\_AES\_256\_CBC\_SHA384  
0xC004 : TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_CBC\_SHA  
0xC005 : TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_CBC\_SHA



0xC009 : TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_CBC\_SHA  
0xC00A : TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_CBC\_SHA  
0xC00E : TLS\_ECDH\_RSA\_WITH\_AES\_128\_CBC\_SHA  
0xC00F : TLS\_ECDH\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0xC013 : TLS\_ECDHE\_RSA\_WITH\_AES\_128\_CBC\_SHA  
0xC014 : TLS\_ECDHE\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0xC023 : TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC024 : TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC025 : TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC026 : TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC027 : TLS\_ECDHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC028 : TLS\_ECDHE\_RSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC029 : TLS\_ECDH\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC02A : TLS\_ECDH\_RSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC02B : TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_GCM\_SHA256  
0xC02C : TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_GCM\_SHA384  
0xC02D : TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_GCM\_SHA256  
0xC02E : TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_GCM\_SHA384  
0xC02F : TLS\_ECDHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
0xC030 : TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
0xC031 : TLS\_ECDH\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
0xC032 : TLS\_ECDH\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
0xC0A0 : TLS\_RSA\_WITH\_AES\_128\_CCM\_8  
0xC0A1 : TLS\_RSA\_WITH\_AES\_256\_CCM\_8  
0xC0A2 : TLS\_DHE\_RSA\_WITH\_AES\_128\_CCM\_8  
0xC0A3 : TLS\_DHE\_RSA\_WITH\_AES\_256\_CCM\_8  
0xCCA8 : TLS\_ECDHE\_RSA\_WITH\_CHACHA20\_POLY1305\_SHA256  
0xCCA9 : TLS\_ECDHE\_ECDSA\_WITH\_CHACHA20\_POLY1305\_SHA256  
0xCCAA : TLS\_DHE\_RSA\_WITH\_CHACHA20\_POLY1305\_SHA256  
0x1301 : TLS\_AES\_128\_GCM\_SHA256  
0x1302 : TLS\_AES\_256\_GCM\_SHA384  
0x1303 : TLS\_CHACHA20\_POLY1305\_SHA256  
0x1304 : TLS\_AES\_128\_CCM\_SHA256



0x1305 : TLS\_AES\_128\_CCM\_8\_SHA256 .

- ✦ The Cipher Suites list (when configured) is used instead of the list of default ciphers, when parameter <CipherSuites> in AT#SSLSECCFG is set to 0 (cipher suite is chosen by remote server).
- ✦ The <CipherSuite>(s) are proposed to the server in the same order as they are added to the list.
- ✦ When <Action> is 3, all supported <CipherSuite>s are added to the list from strongest to weakest.  
PSK <CipherSuite>s are NOT included.
- ✦ If only <ListID> parameter is set, the command prints out the <CipherSuite>(s) currently configured on <ListID> in the following format:  
AT#SSLSECCS=<ListID>  
#SSLSECCS: LIST<ListID>: <01>: <CipherSuite\_#1>  
..  
<n>: <CipherSuite\_#n>  
OK



AT#SSLSECCS=?

Test command returns the supported values for all the parameters.



Add cipher suite 0x1302, 0x1301 and 0x003D to List 1 and display the new list content:

AT#SSLSECCS=1,1,0x1302

OK

AT#SSLSECCS=1,1,0x1301

OK

AT#SSLSECCS=1,1,0x003D

OK



```
AT#SSLSECCS=1
```

```
#SSLSECCS:
```

```
LIST1:
```

```
01: 0x1302
```

```
02: 0x1301
```

```
03: 0x003d
```

```
OK
```



# CloT Optimization



## AT+CCIOTOPT - Clot Optimization Configuration

This command controls Clot EPS (Cellular Internet of Things, Evolved Packet System) optimizations.



3GPP TS 27.007

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT+CCIOTOPT=[<n>[,<supportedUEopt>[,<preferredUEopt>]]]

The set command controls which Clot EPS optimizations the UE indicates as supported and preferred in the ATTACH REQUEST and TRACKING AREA UPDATE REQUEST messages. The command also allows reporting of the Clot EPS optimizations that are supported by the network; an unsolicited result code is used to indicate the supported Clot EPS optimizations by the network:

+CCIOTOPTI: <supportedNetworkopt>

For parameter meaning refer to Unsolicited code values.

Parameters:

Name	Type	Default	Description
<n>	integer	0	enables or disables reporting of unsolicited result code +CCIOTOPTI:
Values: <div>             .....             <div>               0 : Disable reporting             </div> <div>               1 : Enable reporting             </div> <div>               3 : Disable reporting and reset the parameters for Clot EPS optimization to the default values             </div> </div> .....			
<supportedUEopt>	integer	3	indicates the UE's support for Clot EPS optimizations.





<p>Values:</p> <p>.....</p> <p>0 : No support</p> <p>1 : Support for control plane CIoT EPS optimization</p> <p>2 : Support for user plane CIoT EPS optimization</p> <p>3 : Support for both control plane CIoT EPS optimization and user plane CIoT EPS optimization (default value for modules supporting NBIoT technology)</p> <p>.....</p>		
<preferredUEopt>	integer 0	indicates the UE's preference for CIoT EPS optimizations.
<p>Values:</p> <p>.....</p> <p>0 : No preference</p> <p>1 : Preference for control plane CIoT EPS optimization</p> <p>2 : Preference for user plane CIoT EPS optimization</p> <p>.....</p>		

Unsolicited field:

Name	Type	Description
<supportedNetworkopt>	integer	indicates the Network support for CIoT EPS optimizations.
Values:		





	<div> <div>0</div> <div>:</div> <div>No support.</div> </div> <div> <div>1</div> <div>:</div> <div>Support for control plane CIoT EPS optimization</div> </div> <div> <div>2</div> <div>:</div> <div>Support for user plane CIoT EPS optimization</div> </div> <div> <div>3</div> <div>:</div> <div>Support for both control plane CIoT EPS optimization and user plane CIoT EPS optimization</div> </div>
	<p><b>AT+CCIOTOPT?</b></p> <p>Read command returns the current parameter values in the format:</p> <p>+CCIOTOPT :&lt;n&gt;,&lt;supportedUEopt&gt;,&lt;preferredUEopt&gt;</p>
	<p><b>AT+CCIOTOPT=?</b></p> <p>Test command reports the range for the parameters in the format:</p> <p>+CCIOTOPT: (list of supported &lt;n&gt;s),(list of supported &lt;supportedUEopt&gt;s),(list of supported &lt;preferredUEopt&gt;s)</p>



## AT#CCIOTOPT - ClOT Optimization Configuration

This command controls ClOT EPS (Cellular Internet of Things, Evolved Packet System) optimizations.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#CCIOTOPT=<bitmask>

The set command controls which ClOT EPS optimizations the UE indicates as supported and preferred in the ATTACH REQUEST and TRACKING AREA UPDATE REQUEST messages.

Parameter:

Name	Type	Default	Description
<bitmask>	hex	-	<p>is used to store the mask in NVM for subsequent use by protocol stack.</p> <p>The &lt;bitmask&gt; value - formed by four hex digit - is contained in two bytes.</p> <p>The first nine bits, starting from the right, are associated to the nine functions described in the table shown in Additional info.</p> <p>The default &lt;bitmask&gt; value is 0537</p>

Additional info:

►► Bitmap description of the <bitmask> parameter

Last  
Significant  
Byte  
of <bitmask>

Bit 0	EMM_CP_CIOT	Control Plane ClOT optimizations
-------	-------------	----------------------------------



Bit 1	EMM_UP_CIoT	User Plane ClIoT optimizations
Bit 2	EMM_S1_U	S1-U data transfer
Bit 3	EMM_ER_WITHOUT_PDN	EMM registered o PDN connection
Bit 4	EMM_HC_CP_CIoT	RoHC
Bit 5	EMM_SMS_ONLY	
Bit 6	EMM_PNB_CP_CIoT	Preferred network behavior CP ClIoT
Bit 7	EMM_PNB_UP_CIoT	Preferred network behavior UP ClIoT
Most Significant Byte of <bitmask>		
Bit 0	EMM_EPCO_CIoT	Enable/disable extended protocol configuration options
Bit 1	Not used	
Bit 2	EMM_CP_BACKOFF	Support of T3448 timer
Bit 3 ... Bit 7	Not used	

See the example.



AT#CCIOTOPT?

Read command returns the current bitmask value in the format:



#CCIOTOPT :<bitmask>



AT#CCIOTOPT=?

Test command reports the range for the parameter in the format:

#CCIOTOPT: (list of supported <bitmask> values)



Example of setting a value for <bitmask>.

- AT#CCIOTOPT=0137  
OK

In this example, <bitmask>, expressed in four hex digit, is 0137= 0000 0001 0011 0111

The mapping is:

Last Significant Byte of <bitmask>		
1	EMM_CP_CIoT	Control Plane CIoT optimizations
1	EMM_UP_CIoT	User Plane CIoT optimizations
1	EMM_S1_U	S1-U data transfer
0	EMM_ER_WITHOUT_PDN	EMM registered o PDN connection
1	EMM_HC_CP_CIoT	RoHC



1	EMM_SMS_ONLY	
0	EMM_PNB_CP_CIoT	Preferred network behavior CP CIoT
0	EMM_PNB_UP_CIoT	Preferred network behavior UP CIoT
Most Significant Byte of <bitmask>		
1	EMM_EPCO_CIoT	Enable extended protocol configuration options
Bit 1 ... Bit 7	Not used	



## AT#CCIOTOPTEXT – Set Cat-M optimizations indication to network

Set command enables/disables the User Plane CIOT optimization supported indication to network in TAU and attach requests when in Cat-M.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#CCIOTOPTEXT=<en>

Parameter:

Name	Type	Default	Description
<en>	integer	1	Selects the values for User Plane CIOT optimization supported in Cat-M

Values:

0	:	optimization supported
1	:	optimization not supported



Reboot is required for this command to be effective.



AT#CCIOTOPTEXT works only EMM\_UP\_CIoT User Plane CIoT optimizations is set as 1 by AT#CCIOTOPT=<bitmask>; this is the starting condition.



AT#CCIOTOPTEXT has effect only on Cat-M; it controls the User Plane CIoT optimizations setting only on Cat-M



AT#CCIOTOPTEXT?



Read command reports the status (enable/disable):

#CCIOTOPTEXT: <en>



AT#CCIOTOPTEXT=?

Test command returns the supported range of value for parameter:

#CCIOTOPTEXT: (0,1)



# IoT Portal





## AT+ODIS - Command for Saving and Retrieving the Odis Parameters

This command allows the end-user to handle the Host Odis parameters. In case of AT&T LwM2M agent up and running, the command is executed internally to the LwM2M client, updating this client about the values change (i.e.: the server will be notified about this change if the observation on these items is active).

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT+ODIS=<odisInstance>,<hostUniqueDevId>,<hostManufacturer>,<hostModel>,<hostSwVersion>

Parameters:

Name	Type	Default	Description
<odisInstance>	string	N/A	contains the Odis instance where the parameters will be stored
Values: <div> <div>0</div> <div>:</div> <div>Odis instance 0</div> </div> <div> <div>1</div> <div>:</div> <div>Odis instance 1</div> </div>			
<hostUniqueDevId>	string	HUID0	contains a string, between double quotes, with the host unique device identifier.
Value: <div> <div>HUID0</div> <div>:</div> <div>default value</div> </div>			



<hostManufacturer>	string	HMAN0	contains a string, between double quotes, with the host manufacturer identifier.
Value:			
.....			
HMAN0 : default value			
.....			
<hostModel>	string	HMOD0	contains a string, between double quotes, with the host model identifier.
Value:			
.....			
HMOD0 : default value			
.....			
<hostSwVersion>	string	HSW0	contains a string, between double quotes, with the host software version identifier.
Value:			
.....			
HSW0 : default value			
.....			



The odis setting requires all the odis values to be set each time the command is issued, therefore, to change only one odis parameters it is recommended to read all the values first, and then compose the command input string accordingly.



Since the odis items are 4, it is quite unlikely but possible that some the storing of some of them fails. In this case, the new values, where succeeded,



are kept. An advice is that, in case of storing failure, the +ODIS? command is used to verify what are the odis items changed, if any.



Starting from AT&T Specification Reference: 13340 v20.3, <CDR-DVM-1600>, the Odis Instance should be added as a first parameter to the +ODIS AT command. This will result in having a +ODIS command no longer compatible with previous command versions (i.e.: until specification Reference 13340 v20.2).



#### AT+ODIS?

Read command reports the current Odis values in the format:

+ODIS: 0,<hostManufacturer0>,<hostModel0>,<hostSwVersion0>

+ODIS: 1,<hostManufacturer1>,<hostModel1>,<hostSwVersion1>



As per AT&T specification, the <hostUniqueDevId> Odis parameter could be set but it cannot be read by AT commands.



#### AT+ODIS=?

Test command reports the maximum length for all the parameters strings.



## AT#FOTAURC - Sets FOTA Extended URCs

This command allows the end-user to enable/disable the FOTA extended URCs, resulting in a verbosity FOTA operations. Those settings are generally neither related nor manageable with other LwM2M agent commands.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#FOTAURC=<enable>

The settings are stored in the module and are not affected by module power-cycle, TFI or FOTA flashing.

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enable/disable extended URCs
Values:			
.....			
0	:	disable extended URCs	
1	:	enable extended URCs	
.....			



This command affects LwM2M, FA1 and OTAUP operations.



The command should add the following URCs:

#OTAEV: "FOTA REQUEST INIT" at the FOTA startup beginning

#OTAEV: "DOWNLOAD STARTED" at the delta package download beginning

#OTAEV: "DOWNLOAD COMPLETED" at the delta package download end

#OTAEV: "DOWNLOAD FAILED" at the delta package download failure

#OTAEV: "INTEGRITY CHECK PASS" in case of valid delta package

#OTAEV: "INTEGRITY CHECK FAIL" in case of invalid delta package



Please notice that following error URCs are issued always, regardless the #FOTAURC





command setting:

#OTAEV: "DOWNLOAD FAILED"

#OTAEV: "INTEGRITY CHECK FAIL", <errorCode>

 Please notice that the time to issue the URCs is strictly related to the agent that is in charge of managing the FOTA operations and may strongly vary between them.

 Please notice that the #OTAEV: "INTEGRITY CHECK FAIL" URC may appear more than once, according to the retry policy of the delta validity check used by the FOTA entity, such as in LwM2M client.

 <errorCode> reported in #OTAEV: "INTEGRITY CHECK FAIL" URC may assume the following values:

10 in case of invalid delta file (i.e.: when the delta file has an invalid or corrupted tag)

21 in case of CRC calculated error (i.e.: when the delta file is not applicable to the current software version)



AT#FOTAURC?

Returns the <enable> value



AT#FOTAURC=?

Test command reports the supported range of values.



#FOTAURC command examples:

- LwM2M:  
After writing resource1 with a proper URI with a valid delta package link:  
#OTAEV: "FOTA REQUEST INIT"  
#OTAEV: "DOWNLOAD STARTED"  
#OTAEV: "DOWNLOAD COMPLETED"  
#OTAEV: "INTEGRITY CHECK PASS"  
#LWM2MINFO: "GEN", "FOTA REBOOT"  
#OTAEV: Module Upgraded To New Fw  
After writing resource1 with a proper URI with an invalid delta package link:  
#OTAEV: "FOTA REQUEST INIT"



#OTAEV: "DOWNLOAD STARTED"

#OTAEV: "DOWNLOAD COMPLETED"

#OTAEV: "INTEGRITY CHECK FAIL"

After writing resource1 with a proper URI, with a download failure:

#OTAEV: "FOTA REQUEST INIT"

#OTAEV: "DOWNLOAD STARTED"

#OTAEV: "DOWNLOAD FAILED"

- FA1:

After sending an FA1 message with a valid delta package link:

#OTAEV: "FOTA REQUEST INIT"

#OTAEV: "DOWNLOAD STARTED"

#OTAEV: "DOWNLOAD COMPLETED"

#OTAEV: "INTEGRITY CHECK PASS"

#OTAEV: "FOTA REBOOT"

#OTAEV: Module Upgraded To New Fw

- OTAUP:

Using a formerly loaded valid package:

AT#OTAUP=0,3

...

OTAEV: "INTEGRITY CHECK PASS"

...

#OTAEV: Module Upgraded To New Fw

Using a formerly loaded invalid package:

AT#OTAUP=0,3

...

OTAEV: "INTEGRITY CHECK FAIL"



## AT#LWM2MSKIP - LwM2M Client startup mode

The set command enables and disables the LwM2M Client initialization mode at module startup. This command allows to the user the possibility to change the LwM2M client agents initialization.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#LWM2MSKIP=<enable>[,<agentMask>][,<reboot>]

Parameters:




Name	Type	Default	Description
<enable>	integer	0	enables or disables the "skipping client startup" modality
<p>Values:</p> <p>0 : skip is disabled, thus the LwM2M clients selected in the &lt;agentMask&gt; parameter are configured to be started at module startup</p> <p>1 : skip is enabled, thus the LwM2M clients selected in the &lt;agentMask&gt; parameter are configured to be not started at module startup</p>			
<agentMask>	hex	0	<p>set of LwM2M clients affected by the &lt;enable&gt; parameter</p> <p>The command admits the parameter in hexadecimal format without the prefix 0x.</p> <p>The following values and combinations are accepted:</p>



<p>0x1: Telit client, bit mask 00000001</p> <p>0x2: Verizon client, bit mask 00000010</p> <p>0x4: AT&amp;T client, bit mask 00000100</p> <p>0x8: DOCOMO client, bit mask 00001000</p> <p>0x10: reserved for internal use, bit mask 00010000</p> <p>0x20: reserved for internal use, bit mask 00100000</p> <p>ERROR is returned if a bit of the mask has no LwM2M client mapped on.</p> <p>&lt;agentMask&gt;= 0 is not allowed since it is useless: it means that the skipping/not skipping required operation should not affect any clients.</p> <p>Giving the command without &lt;agentMask&gt; parameter will affect all LwM2M clients.</p>			
<p>Value:</p> <p>.....</p> <p>1÷FF : bit mask length</p> <p>.....</p>			
<reboot>	integer	1	enables or disables the automatic reboot possibility after the command setting
<p>Values:</p> <p>.....</p> <p>0 : Reboot is disabled</p> <p>1 : Reboot as part of issuing the command (Default)</p> <p>.....</p>			





-  If the command changes the current agents skip settings, in case of <reboot> parameter missing or set to 1, the module is rebooted. No reboots will be triggered if the command is not changing the current behavior.
-  The command affects only the clients indicated in the <agentMask>. If a client startup is already skipped, a successive skip setting involving another agent will not impact on the former one, see example.
-  There is no relation between the LwM2M in the <agentMask> and the module customization: it is possible to set the skip property for a Verizon client even on a module not customized for it; it simply returns OK but there will not be a real effect at the next startup.



AT#LWM2MSKIP?

Read command reports the current values of parameters in the format:

#LWM2MSKIP: <enable>,<maskStatus>



AT#LWM2MSKIP=?

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



Set the skip property for all agents available in the module: all the clients are stopped at startup (reboot is performed in particular cases, see additional notes) :

AT#LWM2MSKIP=1

OK

All LwM2M clients are skipped. The mask could vary according to the agents available in the module:

AT#LWM2MSKIP?

#LWM2MSKIP: 1,7

OK

Reset the skip property for Telit Client. Please note that the other LwM2M clients are not affected, since not indicated in the <agentMask>

AT#LWM2MSKIP=0,1

OK



AT#LWM2MSKIP?

#LWM2MSKIP: 1,6

OK

Set the skip property for all agents available in the module (reboot is not performed)

AT#LWM2MSKIP=1,,0

OK

Set the skip property for AT&T client. Reboot is not performed, it takes effect at next reboot

AT#LWM2MSKIP=1,4,0

OK

Reset the skip property for AT&T client. Reboot is not performed, it takes effect at next reboot:

AT#LWM2MSKIP=0,4,0

OK



## FOTA & OMA



## FOTA Legacy



## AT#OTAUPW - OTA Delta Write

Execution command starts injection of a delta file into the device.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#OTAUPW=[<verbose\_lev>[,<size>]]

Parameters:

Name	Type	Default	Description
<verbose_lev>	integer	0	Hash mark printing during injection
Values: <div> <div>0 : Hash mark printing disabled during injection</div> <div>1 : Hash mark printing enabled during injection every 8192 bytes</div> </div>			
<size>	integer	-	size in bytes of data to be injected



If the <size> parameter is added, #OTAUPW will finish with OK (or ERROR), otherwise must be closed with +++.



AT#OTAUPW<CR>  
has the same behavior of  
AT#OTAUPW=0



AT#OTAUPW=?

Test command returns OK result code.



## AT#OTAUP - OTA Check and Start Update

Execution command performs validation of delta and firmware update process.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#OTAUP=[<type>]

Parameter:

Name	Type	Default	Description
<type>	integer	0	delta validation and, if delta valid, start of firmware update
Value:			
<div> 0 : delta validation and, if delta valid, start of firmware update </div>			



AT#OTAUP=?

Test command returns OK result code.



## OMA-DM



# AT#HOSTODIS - Host ODIS Parameters Management

The command manages the Host Odis parameters related to AT&T OMA-DM Client.



[1] <CDR-DVM-4532> of AT&T, revision 16.3

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#HOSTODIS=<Param>,<Action>[,<Value>[,<Instance>]]

The set command allows the end-user to handle the Host Odis parameters for AT&T OMADM client

Parameters:

Name	Type	Default	Description
<Param>	integer	N/A	selects the specific item on which work.
<p>Values:</p> <p>.....</p> <p>0 : Host Manufacturer name</p> <p>1 : Host model Name</p> <p>2 : Host Software application version</p> <p>3 : Host Device Unique ID</p> <p>.....</p>			
<Action>	integer	N/A	selects the action to be performed on the item selected by <Param>






<p>Values:</p> <p>.....</p> <p>0 : "SET" action</p> <p>1 : "GET" action</p> <p>2 : "RESET" action</p> <p>.....</p>			
<Value>	string	-	contains a string, between double quotes, with data to be set. Maximum string length is 64 characters. It is valid only if <Action> = 0 ("SET" action)
<Instance>	integer	0	instance number
<p>Value:</p> <p>.....</p> <p>0,1 : allowed values</p> <p>.....</p>			

- ✦ Host Manufacturer, Host Model and Host Software application version do not change after an OTA firmware upgrade
- ✦ "GET" action is not allowed on Host Device Unique ID.
- ✦ There are currently at least two instances of Host Odis parameters. Without specifying the instance, a "GET" action of a parameter will return the instance "0".
- ✦ Default values for instance 0, according to specification [1], are:  
HMAN0 (for Host Manufacturer)  
HMOD0 (for Host Model)  
HSW0 (for Host Software version)  
HUID0 (for Host Device Unique ID)



 Default values for instance 1, according to specification [1], are:  
 HMAN1 (for Host Manufacturer)  
 HMOD1 (for Host Model)  
 HSW1 (for Host Software version)  
 HUID1 (for Host Device Unique ID)



AT#HOSTODIS=?

Test command returns the supported values ranges of the parameters.



Get the currently set values (i.e.: Host Model)

```
AT#HOSTODIS=1,1
#HOSTODIS:"HMOD0"
OK
```

Set a new Host Model value

```
AT#HOSTODIS=1,0,"Model #4 - 2nd version"
OK
```

Get the currently set value

```
AT#HOSTODIS=1,1
#HOSTODIS: "Model #4 - 2nd version"
OK
```

Reset the Model value

```
AT#HOSTODIS=1,2
OK
```

Get again the currently set value

```
AT#HOSTODIS=1,1
#HOSTODIS:"HMOD0"
OK
```

Get the currently set value of Host Manufacturer of instance 0

```
AT#HOSTODIS=0,1,,0
#HOSTODIS:"HMAN0"
OK
```

Get the currently set value of Host Manufacturer of instance 1

```
AT#HOSTODIS=0,1,,1
```



```
#HOSTODIS:"HMAN1"  
OK
```



# M2M



## AT#M2MCHDIR - M2M File System Change Current Directory

This command manages the M2M File System.

SIM Presence	Setting saved	Can be aborted
Not required	No	No









**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 "/mod".



**AT#M2MCHDIR?**

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

#M2MCHDIR: "<path>"

Additional info:



►► Parameter description is:

Name	Type	Default	Description
<path>	string	-	Absolute path name, quoted string type (max 128 chars, case sensitive)



AT#M2MCHDIR=?

Test command returns OK result code.



Check directory and move to dir1 directory.

- AT#M2MCHDIR?  
#M2MCHDIR: "/mod"  
OK  
AT#M2MCHDIR="dir1"  
OK  
AT#M2MCHDIR?  
#M2MCHDIR: "/mod/dir1"  
OK



## AT#M2MMKDIR - M2M File System Make Directory

This command manages the M2M File System.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#M2MMKDIR=<directory\_name>

Set command makes a new directory in current directory (see #M2MCHDIR) or on a specified path. The new directory must be created on existing path, only one directory at time can be created.

Parameter:

Name	Type	Default	Description
<directory_name>	string	-	can be: full directory path name starting with "/" (parent directory must exist) relative directory path name (parent directory must exist) directory name (in current directory)



Maximum full directory length is 128 chars, maximum folder name is 64 chars.



<directory\_name> is case sensitive.



<directory\_name> can be equivalently enclosed on quote or not.



AT#M2MMKDIR=?

Test command returns OK result code



AT#M2MMKDIR="dir1"

OK

AT#M2MMKDIRmyfolder

OK



```
AT#M2MMKDIR="/myfolder/mySubfolder"  
OK
```

```
AT#M2MCHDIR="/myfolder/mySubfolder"  
OK
```

```
AT#M2MMKDIR=newFolder  
OK
```

```
AT#M2MCHDIR="/myfolder/mySubfolder/newFolder"  
OK
```





## AT#M2MBACKUP - M2M Set Backup Feature

This command manages the M2M File System and backup partition.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No

➡ **AT#M2MBACKUP=<mode>[,<file\_bin>]**

Set command creates or removes backup image of the executable binary file if <file\_bin> is present.

Otherwise the command sets or resets backup mode. Files in FS that have their backed up image activated, are auto recovered in case of corruption or deletion

Parameters:

Name	Type	Default	Description
<mode>	integer	0	set/reset the BACKUP mode

Values:

- 0 : disable BACKUP mode; If <file\_bin> is provided removes specified binary file from backup area otherwise remove all binary files already under backup
- 1 : AUTOMATIC backup mode; If <file\_bin> is not provided below setting is applied to all backed up applications. If during application start there is a mismatch between its valid FS image and its valid backed up version, backed up version will be auto updated
- 2 : MANUAL backup mode; If <file\_bin> is not provided below setting is applied to all backed up applications. If during application start there is a mismatch between its valid FS image and its valid backed up version, backed up version will not be updated, it remains as an old backed up version



3 : DEFRAG backup mode; It defragments backup memory area. In optimal situation without memory fragmentation, available and contiguous memory have the same size. Memory fragmentation can occur for example when an application is cancelled from backup area, depending on its position and size in memory. It is recommended to execute memory defragmentation each time contiguous memory is not sufficient and different from available. The operation of defragmentation could take a while, depending on the current memory state. If <file\_bin> is provided, ERROR is returned

<p>&lt;file_bin&gt; string -</p>	<p>*.bin file, its format is a quoted or unquoted string (max 64 chars, case sensitive).</p> <p>File name extension must be .bin. It must be an executable, see #M2MRUN, that is already set as executable.</p> <p>If parameter &lt;file_bin&gt; is not present, the setting is applied to all backed up files.</p>
----------------------------------	---

#### Additional info:

►► The modes <mode>=0, <mode>=1 and <mode>=2 have immediate effect.

AT#M2MBACKUP=0  
Remove all binary files already under backup.

AT# M2MBACKUP=1  
Set AUTO mode to all binary files already under backup

AT# M2MBACKUP=2  
Set MANUAL mode to all binary files already under backup

AT# M2MBACKUP=0,"app1.bin"  
Remove ,"/mode/app1.bin" from backup area

AT# M2MBACKUP=1,"app1.bin"  
Store "/mod/app1.bin" app in backup area with AUTOMATIC mode



AT# M2MBACKUP=2,"app1.bin"  
Store "/mod/app1.bin" app in backup area with MANUAL mode

AT# M2MBACKUP=3  
Defrag all app in backup area

- ✦ Only an executable binary file can be included in backup system (see #M2MRUN)
- ✦ It is not possible to simply delete an application from FS if app is under backup, since it will be restored by the system. It is even not possible to remove application that is under backup from execution list using appzone APIs (see appMng).  
If instead application is removed from execution list by directly changing "/mod/appcfg.ini", it will be also removed from backup
- ✦ If FS image is corrupted\deleted and it is under backup, it will be auto recovered during application start or commands which refer to it (#M2MRUN=4, .. , #M2MRUN?)
- ✦ The backup defrag command does not require any other parameters; if <file\_bin> is provided, the command fails

#### 🔍 AT#M2MBACKUP?

Read command reports the BACKED UP files. The report has the following format:

#M2MBACKUP: <app.bin>, <mode>, <size>

#M2MBACKUP: <tot\_size>, <available>, <contiguous>

Additional info:

- ▶▶ Here are the parameters meanings



Name	Type	Default	Description
<app.bin>	string	-	Application backup name
<mode>	integer	N/A	Application backup mode
Values: <div> <div>0</div> <div>:</div> <div>disable BACKUP mode</div> </div> <div> <div>1</div> <div>:</div> <div>automatic BACKUP mode</div> </div> <div> <div>2</div> <div>:</div> <div>manual BACKUP mode</div> </div> <div> <div>3</div> <div>:</div> <div>defrag BACKUP</div> </div>			
<size>	integer	-	Size of app in bytes in backup area
<tot_size>	integer	-	Total size of backup area in bytes
<available>	integer	-	Available size of backup area in bytes
<contiguous>	integer	-	Max number of contiguous available bytes in backup area

#### AT#M2MBACKUP=?

Test command returns the values range of the <mode> parameter and the maximum number of characters of the <file\_bin> parameter. The format is:

#M2MBACKUP: (0-3), 64



---

**</>**      Set BACKUP mode and select application to backup  
AT#M2MBACKUP=1,app.bin  
OK

Check the BACKUP status value.

AT#M2MBACKUP?

#M2MBACKUP: <app.bin, 1, 51232>

#M2MBACKUP: <1048576, 997344, 997344>

OK

---



## AT#M2MRMDIR - M2M File System Remove Directory

This command removes a directory in the M2M file system.

SIM Presence	Setting saved	Can be aborted
Not required	No	No








AT#M2MRMDIR=<directory\_name>

Set command deletes a specified directory in current directory (see #M2MCHDIR) or a directory in a specified path.

Parameter:

Name	Type	Default	Description
<directory_name>	string	-	can be: full directory path name starting with "/" relative directory path name directory name (in current directory)

-  Maximum full directory length is 128 chars, maximum folder name is 64 chars
-  If <directory\_name> is not present an error code is reported
-  <directory\_name> is case sensitive
-  <directory\_name> can be equivalently enclosed on quote or not
-  To be removed, the <directory\_name> must be empty otherwise an error is returned.



AT#M2MRMDIR=?

Test command returns OK result code.



AT#M2MRMDIR=dir1  
OK



```
AT#M2MRMDIR="/myfolder/dir2"  
OK  
AT#M2MCHDIR="/myfolder"  
OK  
AT#M2MRMDIR="mySubfolder/dir3"  
OK
```



## AT+M2M - Enable/disable M2M Application execution

This command enable/disable the M2M Application execution start mode and port availability.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



**AT+M2M=<mode>[,<delay>[,<timeout>]]**

Set command sets the M2M Application start mode. After issuing the AT command, the module automatically restart, except for <mode> 5, where it depends on previous <mode> setting.

Parameters:

Name	Type	Default	Description
<mode>	integer	1	M2M application execution start mode
<p>Values:</p> <p>.....</p> <p>0 : AppZone engine does not start at the next reboot</p> <p>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.</p> <p>4 : AppZone engine starts at the next reboot using the delay set by &lt;delay&gt; parameter, if missing is used the default value 10.</p> <p>5 : activate or deactivate AT port on USB/UART channels. With this &lt;mode&gt;, the value &lt;delay&gt; assumes instead the meaning of &lt;ATport_availability&gt;. &lt;timeout&gt; has only effect with this &lt;mode&gt;.</p> <p>.....</p>			





<delay>	integer	-	<p>M2M application execution start time-out expressed in seconds. Parameter &lt;delay&gt; is used only if parameter &lt;mode&gt; is set to 4.</p> <p>If parameter &lt;mode&gt; is set to 5 then &lt;delay&gt; assumes the meaning of &lt;ATport_availability&gt;.</p> <p>See Additional info section. .</p>
<timeout>	integer	10	<p>Parameter &lt;timeout&gt; is used only if parameter &lt;mode&gt; is set to 5. Provided AT port will be auto-activated if ports are locked and any AppZone application does not request parser port control through dedicated API within a defined interval that is defined in this way: AT port will be activated immediately if there is no any auto-run app or after &lt;timeout&gt; seconds behind the max delay of configured auto-run app. AppZone can take control of ports using m2mb_atp_enablePortCtrl API.</p>
<p>Value:</p> <p>.....</p> <p>10÷60 : timeout in seconds</p> <p>.....</p>			

Additional info:

►► Values of <delay> when <mode> is 0,1,4:

Name	Type	Default	Description
<delay>	integer	0	M2M application execution start time-out expressed in seconds.
<p>Values:</p>			



- 0 : no delay for AppZone engine to start
- 10÷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.

►► Values of <delay> when <mode> is 5:

Name	Type	Default	Description
<delay>	integer	20	If parameter <mode> is set to 5 then <delay> assumes the meaning of <ATport_availability>.
Values:			
10 : exclude AT parser for all USB\UART ports			
11 : exclude AT parser for all USB ports			
12 : exclude AT parser for all UART ports			
20 : enable AT parser for all USB\UART ports (equivalent to <mode> 1 except for reboot functionality)			
21 : enable AT parser for all USB ports (equivalent of 12)			
22 : enable AT parser for all UART ports (equivalent of 11)			



- ▶▶ In <mode> 5, <delay> assumes the meaning of <ATport\_availability> selecting the way to block/unblock the AT ports, therefore AppZone engine starts with no delay.

✦ When command AT+M2M=5,<ATport\_availability>,<timeout> is issued with <mode> 5 already set, the setting will be activated without reboot; for all other previous <mode> reboot is instead executed.

✦ If <ATport\_availability> or <timeout> are out of range the command fails.

✦ Any invalid value found at reboot in <mode> 5 for <ATport\_availability> and <timeout> is replaced by its corresponding default setting (20 for <ATport\_availability> and 10 for <timeout>).



#### AT+M2M?

Read command reports the M2M application execution start mode, start time-out and start shell in the format:

+M2M:<mode>,<delay>

If current <mode> is 5, the read command reports also <timeout> in the format:

+M2M:<mode>,<ATport\_availability>,<timeout>



#### AT+M2M=?

Test command returns the range of available values for parameters <mode>, <delay> and <timeout>.

+M2M: (0,1,4,5),(0,10-60),(10-60)





This AT command causes a reboot



**AT+M2M=5,10,12**

AppZone engine starts without any delay with all AT ports disabled; the ports will be auto-activated again if AppZone engine does not receive any request from applications to control the AT ports within 12 seconds behind max application configured delay

**AT+M2M=5,10**

AppZone engine starts without any delay with all AT ports disabled; the ports will be auto-activated again if AppZone engine does not receive any request from applications to control the AT ports within 10 seconds (default) behind max application configured delay

**AT+M2M=5,11,20**

AppZone engine starts without any delay and all USB AT ports disabled; the ports will be auto-activated again if AppZone engine does not receive any request from applications to control the AT ports within 20 seconds behind max application configured delay

**AT+M2M=5,12,15**

AppZone engine starts without any delay and all UART AT ports disabled; the ports will be auto-activated again if AppZone engine does not receive any request from applications to control the AT ports within 15 seconds behind max application configured delay

**AT+M2M=5,20,10**

AppZone engine starts without any delay and all AT ports enabled. <timeout> to unblock the AT ports is set but never used, since all ports are already enabled

**AT+M2M=5,21,10**

AppZone engine starts without any delay and all USB AT ports enabled. Also UART AT ports will be auto-activated again if AppZone engine does not receive any request from



applications to control the AT ports within 10 seconds behind max application configured delay

AT+M2M=5,21

AppZone engine starts without any delay and all USB AT ports enabled. Also UART AT ports will be auto-activated again if AppZone engine does not receive any request from applications to control the AT ports within 10 seconds (default) behind max application configured delay

AT+M2M=5,22

AppZone engine starts without any delay and all UART AT ports enabled. Also USB AT ports will be auto-activated again if AppZone engine does not receive any request from applications to control the AT ports within 10 seconds (default) behind max application configured delay



## 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
Not required	Other	No



Set command sets/resets the RUN file permission and the delay start of the executable binary files with ".bin" extension, stored in the directory /mod. Please see note for the executable binary definition. It supports the multi-app feature.

AT#M2MRUN=<mode>[, [<file\_bin>], <delay>]]

Parameters:

Name	Type	Default	Description
<mode>	integer	N/A	set/reset the RUN file permission
Values: <div> <div>0÷2 : Boot mode: it takes effect after next reboot, see Additional info section</div> <div>3÷5 : Immediate mode: it immediately takes effect (start\stop), see Additional info section</div> </div>			
<file_bin>	string	-	*.bin file for which you RUN permission has to be set, its format is a quoted or unquoted string (max 64 chars, case sensitive). File name extension must be .bin. If parameter <file_bin> is not present, the setting is applied to all executable files.
<delay>	integer	0	is the <file_bin> delay parameter if the <file_bin> is present, otherwise it effects all the executables present in the /mod directory.



Delay is relative to AppZone engine start which is in turn delayed by +M2M command setting.

Depending on selected <mode> two different delays have effects, see Additional info section

Value:

.....  
0÷60 : range of the delay expressed in seconds  
.....

Additional info:

►► The boot modes <mode>=0, <mode>=1 and <mode>=2 have effect after next reboot.

AT#M2MRUN=0

NO RUN permission for all executables \*.bin files in "/mod ", the command does not set all binary file as executable

AT#M2MRUN=1

RUN permission for all executables \*.bin files in "/mod ", the command does not set all binary file as executable

AT#M2MRUN=2,"app2.bin"

Exclusive RUN permission: if file exist, set "/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: if it exists, set "/mod/app2.bin" as executable, current delay not changed or set to default 0 if not still an executable

AT#M2MRUN=1,"app3.bin",0

RUN permission: if it exists, set "/mod/app3.bin" as executable and delay set to 0

AT#M2MRUN=0,"app2.bin",0

NO RUN permission: if it exists, set "/mod/app2.bin" as executable, 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;
- <mode>=3 does not require any executable is running, having in mind the aim of the command.
- After exclusive load (<mode>= 5) the other executables than the selected one, are immediately stopped with 0 delay, but their own previous immediate delays are preserved.

AT#M2MRUN=3

in place stop of all apps in running with their last set immediate delay.

In case of error the command will try in any case to stop as many executables as possible

AT#M2MRUN=3,,20

in place stop of all apps after 20 seconds of delay

AT#M2MRUN=3,"app2.bin"

in place stop of app2.bin, after its own last volatile delay

AT#M2MRUN=3,"app2.bin",0

immediate stop of app2.bin

AT#M2MRUN=3,"app2.bin",10

in place stop of app2.bin after 10 seconds





AT#M2MRUN=4 in place start of all apps if not already in running. The current immediate delays are used. In case of error, will try to start in any case as many executables as possible

AT#M2MRUN=4,,20 in place start of all apps if not already in running after 20 seconds for all

AT#M2MRUN=4,"app2.bin" in place start of app2.bin if not already in running with the current immediate delay

AT#M2MRUN=4,"app2.bin",10 in place start of app2.bin if not already in running after 10 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 10 sec. delay

►► Depending on selected <mode> 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 <mode>=5 in additional info.

- ✦ Parameters setting provided with <mode> in boot mode range is saved on "/mod/appcfg.ini" file
- ✦ Executables are binary files with ".bin" extension saved in "/mod" directory which RUN permission has been set individually by #M2MRUN command (boot mode) including specific \*.bin file. The integrity check is performed internally.
- ✦ In order to allow any application to start, the AppZone engine must be running (see +M2M).



#### 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	N/A		executable run state
Values: <div> <div>0</div> <div>:</div> <div>ready</div> </div> <div> <div>1</div> <div>:</div> <div>starting (not yet in running)</div> </div> <div> <div>2</div> <div>:</div> <div>running</div> </div> <div> <div>3</div> <div>:</div> <div>stopping (still in running)</div> </div> <div> <div>4</div> <div>:</div> <div>stopped (has been stopped, can be restarted)</div> </div> <div> <div>5</div> <div>:</div> <div>signing warning state, signature mismatch has been revealed in "warning signing mode" and application was allowed to start anyway. Check #M2MSAPP command for more details about signing modes</div> </div> <div> <div>6</div> <div>:</div> <div>signing error state, wrong signature has been revealed in "signing mode" so app has been blocked and cannot start. Check #M2MSAPP command for more details about signing modes</div> </div>				
<vaN>	hex	-		load virtual address of executable
<ramN>	integer	-		ram usage of executable if running, or estimated ram needed, 20KB bounded, if not running



- In case CRC integrity error is detected for appN, AT#M2MRUN? command provides the following response

...

#M2MRUN: <appN,bin,ERROR\_INTEGRITY>

- In signing mode (refer to #M2MSAPP) for every not signed app an error of integrity is provided like in disabled signing mode in case of CRC error, whereas for wrong signed app a signing error state is provided

#M2MRUN: <app1.bin,0,0,6,0x48000000,0>

#M2MRUN: <app2.bin,0,0,2,0x44000000,312000>

...

#M2MRUN: <appN.bin,ERROR\_INTEGRITY>

app1 has been blocked for wrong signature

app2 is correctly signed and running

appN was blocked since not signed

- Same situation as above but with signing warning mode active (refer to #M2MSAPP)

#M2MRUN: <app1.bin,0,0,5,0x48000000,256825>

#M2MRUN: <app2.bin,0,0,2,0x44000000,312000>

...

#M2MRUN: <appN.bin,ERROR\_INTEGRITY>

app1 is in warning state, wrong signature has been detected but it was allowed to start

app2 is correctly signed and running

appN was blocked since not signed





AT#M2MRUN? will reflect executable removal from file system:

Immediately if not in running

After stop of the executable if in 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)



## AT#M2MSAPP - M2M Set App signing mode

The set command is used to set the applications signing mode based on the Elliptic Curve Cryptography (ECC). SECP256R1 curve is used.

SIM Presence	Setting saved	Can be aborted
Not required	Other	No

AT#M2MSAPP=[<mode>]

Parameters:

Name	Type	Default	Description
<mode>	integer	0	set the applications signing mode

Values:

- 0 : disabled signing mode (default); it allows applications to start without sign verification. Instead, a CRC based check is performed to ensure integrity of the applications
- 1 : warning signing mode; it has to be considered only as a temporarily mode where signatures are checked providing a warning in case of signature mismatching (refer to AT#M2MRUN? for warning) but letting only any signed application (correctly or not) to run. Binary integrity is not assured neither by signing nor by CRC
- 2 : signing mode; it enforces signature verification and blocks any application not correctly signed (full integrity check)

Additional info:

### ►► AT#M2MSAPP=0

This is the default value out of production. The command set to 0 is allowed only in 0 mode providing OK since it only confirms the current status. Provides always error in any other mode. In 0 mode all applications with valid CRC are allowed to start, regardless they have a valid or invalid signature: signature is simply not considered.



### AT#M2MSAPP =1

The command sets warning signing mode, (to be considered transitory) where application signatures are checked and only a warning is provided by AT#M2MRUN? command (refer to it for warning message) in case of signature mismatching. However, only any signed applications are allowed to start despite the warning. Binary integrity is not assured neither by signing nor by CRC. The transition to mode 1 is allowed only from 0 if at least a valid public key has been correctly injected by AT#M2MKEY command (refer to it).

### AT#M2MSAPP =2

The command sets signing mode which enforces signature verification and blocks any application that has a signature mismatch: in case of mismatch an error is provided by AT#M2MRUN command (refer to it). The transition to mode 2 is allowed from 0 provided a valid public key has been injected (refer to AT#M2MKEY command) or from 1.

- Signing mode is an OTP process: change is allowed from disabled signing mode (0) to everywhere (1 or 2) and from warning signing mode (1) only to signing mode (2); signing mode (2) cannot be changed.

The only viable transitions are:

0 -> 0 (no transition, but allowed as confirmation)

0 -> 1 (provided at least a valid public key has been injected. Refer to #M2MKEY command)

0 -> 2 (provided at least a valid public key has been injected. Refer to #M2MKEY command)

1 -> 2

- 
- ✦ Application are binary files with ".bin" extension saved in "/mod" directory which RUN permission has been set individually by #M2MRUN command (boot mode) including specific \*.bin file. The integrity check is performed internally.
  - ✦ In order to allow any application to start, the AppZone engine must be running (see +M2M).
  - ✦ An application with wrong signature is blocked to start when the mode is set to signing mode.
  - ✦ Refer to #M2MKEY command to see how a public key used to sign verification can be added and to #M2MRUN to see how warning can be revealed.
- 



## AT#M2MSAPP?

Read command reports the applications signing mode. The report has the following format:

#M2MSAPP: <mode>

Additional info:

►► Parameter meaning:

Name	Type	Default	Description
<mode>	integer	N/A	applications signing mode
Values:			
0 : disabled signing mode			
1 : warning signing mode			
2 : signing mode			

## AT#M2MSAPP=?

Test command returns the values range of the <mode> parameter. The format is:

#M2MSAPP: (0-2)





## AT#M2MKEY - M2M Set public keys for signed applications

AT command used to add the public key for signature verification of an application with ECDSA. The ECDSA (Elliptic Curve Digital Signature Algorithm) is a cryptographically secure digital signature scheme, based on the elliptic-curve cryptography (ECC). The application signature verification is performed by checking and verifying matching with provided public keys, up to 4. The used ECC curve is SECP256R1 .

SIM Presence	Setting saved	Can be aborted
Not required	Other	No

AT#M2MKEY=<slot>,<key>

Parameters:

Name	Type	Default	Description
<slot>	integer	N/A	Add a public key in the selected slot
Values: ..... 0÷3 : Slots available for the public keys .....			
<key>	string	-	Hexadecimal string with the public key. The public key in uncompressed form has 128 hex characters, whereas in compressed form has 66 hex characters, being always "02" or "03" prepended. Public keys is anyway saved in trusted mode

Additional info:

- ▶▶ The AT command AT#M2MKEY can be used only when AT#M2MSAPP is in state 0.
- ▶▶ Being an OTP process, injected key cannot be deleted or overwritten, nor it is allowed to add public keys if the signing mode is still disabled (refers to #M2MSAPP for signing mode).



- ▶▶ In order to be corrected added, a public key must adhere to defined ECC SECP256R1 curve, otherwise an error is provided and key rejected. In case of success public keys is anyway saved in trusted mode.
- ▶▶ Signature verification is performed by checking all the public keys provided in the slots against the application signature and hash of the binary, provided the key has not been revoked.
- ▶▶ A public key can be subsequently revoked in an OTP process, using dedicated API from a valid signed application and its slot invalidated. A key (or slot) can be revoked only if it is not the last available and not revoked key.

### AT#M2MKEY?

Read command reports the used slots, the keys revocation status and the hashing of valid and not revoked keys present

#M2MKEY: (slot0,slot1,slot2,slot3),(rev0,rev1,rev2,rev3),<hash>

Additional info:

- ▶▶ Here are the parameters meanings.

Name	Type	Default	Description
<(slot0,slot1,slot2,slot3)>	integer	N/A	Slot
Values:			
0 : Free slot			
1 : Slot written with a key			
<(rev0,rev1,rev2,rev3)>	integer	N/A	executable run state
Values:			



<div> <div>0 : The slot (so the key) has not been revoked</div> <div>1 : The slot has been revoked and the key cannot be used</div> </div>			
<hash>	hex	-	Hash of the valid and not revoked keys. In case all slots are empty <0..0> is provided
<div> <div>AT#M2MKEY=?</div> <div>Test command returns OK</div> </div>			

Add a public key in compressed form to the slot 2. Length is 66 characters and 02 is prepended in this example

AT#M2MKEY=2,02888C9139BC8215F3B9AD26D72F80BF33B7BB349534CE09036D53E45969926E18

Read command example:

AT#M2MKEY? #M2MKEY: (1,1,0,0),  
(0,0,0,0),<3CC9F65493AA2619DA76D7B92A76A77597CFB5D4F690B64B7F8A0A208BC69073>



## AT#M2MDEL - M2M Delete File

This command deletes specified file stored in the File System.

SIM Presence	Setting saved	Can be aborted
Not required	No	No







AT#M2MDEL=<file\_name>

Set command removes the <file\_name> in the file system.

Parameter:

Name	Type	Default	Description
<file_name>	string	-	can be: full file path name starting with "/" relative file path name file name (in current directory)

-  Maximum full path length is 128 chars, maximum folder or file name is 64 chars. Overall max full file path is 128 + 64 = 192 chars.
-  If the file <file\_name> or its path is not present an error code is reported.
-  <file\_name> and its path are case sensitive.
-  <file\_name> can be equivalently enclosed on quote or not.



AT#M2MDEL=?

Test command returns OK result code.



```
</> Remove M2MAPZ.bin file in "/mod" folder
AT#M2MDEL="/mod/M2MAPZ.bin"
OK
AT#M2MCHDIRmyFolder
OK
AT#M2MDEL=mySubfolder/myFile.txt
OK
```



## AT#M2MLIST - M2M File System List

This command lists the contents of a folder in the File System.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT#M2MLIST[=<path>]

Execution command reports the list of directories and files stored in current directory of the file system (see #M2MCHDIR for current path) or in path specified by <path>. The report is shown in Additional info section.

Parameter:

Name	Type	Default	Description
<path>	string	-	can be: full directory path if starting with "/" relative directory path name directory name (in current directory)

Additional info:









Here is the report format:

```
[<CR><LF>#M2MLIST: <.>
<CR><LF>#M2MLIST: <..>]
[<CR><LF>#M2MLIST: <<dir_name1>>...
<CR><LF>#M2MLIST: <<dir_name_n>>]
[<CR><LF>#M2MLIST: "<file_name1>",<size1>...
<CR><LF>#M2MLIST: "<file_name_n>",<size_n>]
```

Name	Type	Default	Description
<.>	string	-	current directory
<..>	string	-	upper directory



<dir_name>	string	-	directory name, string type delimited by characters '<' and '>' (max 64 characters, case sensitive).
<file_name>	string	-	file name, quoted sting type (max 64 characters, case sensitive).
<size>	string	-	size of file 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 "/mod".



AT#M2MLIST=?

Test command returns OK result code.



```

AT#M2MLIST
#M2MLIST: <.>
#M2MLIST: <..>
#M2MLIST: <dir1>
#M2MLIST: "file_load.bin",58044

AT#M2MLISTmypath/myfolder
#M2MLIST: <.>
#M2MLIST: <..>
#M2MLIST: <mysubfolder>
#M2MLIST: "myfile.txt",512
#M2MLIST: "readm.txt",140

```



```
AT#M2MCHDIRmypath  
OK
```

```
AT#M2MLIST=myfolder  
#M2MLIST: <.>  
#M2MLIST: <..>  
#M2MLIST: <mysubfolder>  
#M2MLIST: "myfile.txt",512  
#M2MLIST: "readm.txt",140
```





## AT#M2MREAD - M2M Read File

This command reports the content of a file stored in the File System.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



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.





```
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
```



## AT#M2MWRITE - M2M Write a File

This command stores a file in the file system.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



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>	integer	-	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.



✎ <file\_name> can be equivalently enclosed on quote or not.

✎ <file\_name> and its path are case sensitive.



AT#M2MWRITE=?

Test commands returns OK result code.



Store "M2MAPZ.bin" file in "/mod" folder.

AT#M2MWRITE="/mod/M2MAPZ.bin",58044

>>> here receives the prompt; then type or send the file, sized 58044 bytes

OK

AT#M2MCHDIRmyFolder

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 "/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



## 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
Not required	No	No



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	0	enable/disable verbose mode
Values:			
.....			
0 : text format			
.....			
1 : hexadecimal format			
.....			



<chunkPrint>	integer	0	chunk print mode
--------------	---------	---	------------------

Values:

- |   |   |  |
|---|---|--|
| 0 | : | print whole file content at once or one <maxByte> and exit |
| 1 | : | print one < maxByte > and wait for <CR> char to continue   |

-  <maxByte>=0 and <chunkPrint>=1 combination is not allowed.
-  Maximum full path length is 128 chars, maximum folder or file name is 64 chars. Overall max full file path is 128 + 64 = 192 chars.
-  If the file <file\_name> or its path is not present in the file system, an error code is reported.
-  <file\_name> and its path are case sensitive.
-  <file\_name> can be equivalently enclosed on quote or not.
-  When printing the file content in <maxByte> chunks, omit the <file\_name> on all subsequent AT command executions. Check code examples for further details.



AT#M2MREADEXT=?

Test command returns OK result code.



```
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

## AT#M2MRAM - AppZone RAM Info

The execution command returns information on RAM memory for AppZone applications.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### 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





## 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
Not required	Other	No




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.
<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:  AT#M2MARG=app.bin,arg1,arg2,...,argN set the arguments to "/mod/app.bin" if it exists  AT#M2MARG=,arg,arg2,...,argN set the arguments to all executables  AT#M2MARG=app.bin, delete the arguments of "/mod/app.bin" if it exists



AT#M2MARG=,  
delete the arguments of all executable  
AT#M2MARG=app.bin,arg1,,arg3  
if an empty arg is provided in between other  
args, an ERROR is returned being the current  
args remained unchanged

 The arguments entered by the command are saved on "/mod/appcfg.ini" file.



AT#M2MARG?

Read command reports the available executables and their current arguments. The report has the following format:

```
#M2MARG: <app1.bin,arg1,arg2,...,argN1>
#M2MARG: <app2.bin,arg1,arg2,...,argN2>
...
#M2MARG: <appQ.bin,arg1,arg2,...,argNQ>
```



AT#M2MARG=?

Test command returns the max characters number of <file\_bin> binary file name and of the <argn> parameters. The format is:

```
#M2MARG: 64,32,...,32
```



```
AT#M2MARG=app1.bin,one,two,12,34.5
OK
AT#M2MARG=app2.bin,first,"second and third"
OK
AT#M2MARG=?
#M2MARG: <app1.bin, one,two,12,34.5>
#M2MARG: <app2.bin, first,"second and third">
OK
```



# MQTT



## AT#MQEN - Enable MQTT Feature

This command initializes a MQTT client and allocates the necessary resources.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQEN=<instanceNumber>,<enable>

Set command enables/disables the MQTT client for further configuration and usage.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance to activate or deactivate
Value: <div> <div>1÷maxClients</div> <div>:</div> <div>client instance range. To know maxClients value use test command</div> </div>			
<enable>	integer	N/A	selects if client must be activated or deactivated
Values: <div> <div>0</div> <div>:</div> <div>disable</div> </div> <div> <div>1</div> <div>:</div> <div>enable</div> </div>			



**AT#MQEN?**

Read command returns the status of the MQTT stack in the format

#MQEN: &lt;instanceNumber&gt;,&lt;enabled&gt;

**AT#MQEN=?**

Test command reports the available range of values for parameters.



Read command

AT#MQEN?

#MQEN: 1,1

#MQEN: 2,0

OK

Test command

AT#MQEN=?

#MQEN: (1-maxClients),(0-1)

OK



## AT#MQCFG - Configure MQTT Parameters

This sets the connection parameters for the selected MQTT client.

SIM Presence	Setting saved	Can be aborted
Required	No	No




AT#MQCFG=<instanceNumber>,<hostname>,<port>,<cid>[,<sslEn>,<sslInstance>]


Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance. The list of available clients is obtained with AT#MQEN? or the read command
Value:  1÷maxClients : client instance range. To know maxClients value use test command  			
<hostname>	string	-	URL of the MQTT broker. Default value: 0. Maximum length of <hostname> is 512 characters.
<port>	integer	0	TCP port of the MQTT broker
Value:  1÷65535 : TCP port range  			
<cid>	integer	N/A	PDP Context ID to be used for the connection. PDP context should be



enabled before giving this command. Default value 0.		
Value: ..... 1÷6 : <cid> range .....		
<sslEn>	integer 0	enable/disable SSL
Values: ..... 0 : disable  1 : enable .....		
<sslInstance>	integer 1	selects the ssl instance configuration to be used for this MQTT client.  The list of available ssl instances is obtained with the read command
Value: ..... 1÷maxClients : ssl instance range.  To know ssl instance value use test command. If the value is not provided it will select ssl instance 1 by default .....		

 **AT#MQCFG?**  
Read command returns the configuration of all active MQTT clients in the format:  
#MQCFG: <instanceNumber>,<hostname>,<port>,<cid>[,<sslEn>,<sslInstance>]

 **AT#MQCFG=?**  
Test command reports the available range of values for parameters.





- SSL disabled (by default)  
Set command  
AT#MQCFG=1,api.mybroker.com,1883,3  
OK  
  
Read command  
AT#MQCFG?  
#MQCFG: 1,api.mybroker.com,1883,3,0  
#MQCFG: 2,,1883,1  
OK  
  
Test command  
AT#MQCFG=?  
#MQCFG: (1-maxClients),512,(1-65535),(1-6),(0-1),(1-maxSSLInstance)  
OK
- SSL enabled  
  
AT#MQCFG=1,api.mybroker.com,8883,3,1  
OK  
  
Read command  
AT#MQCFG?  
#MQCFG: 1,api.mybroker.com,8883,3,1  
#MQCFG: 2,,1883,1,0  
OK  
  
Test command  
AT#MQCFG=?  
#MQCFG: (1-maxClients),512,(1-65535),(1-6),(0-1),(1-maxSSLInstance)  
OK





## AT#MQDISC - Log Out and Disconnect from the MQTT Broker

This command performs the logout and disconnection from to the MQTT broker.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#MQDISC=<instanceNumber>**

Disconnects gracefully from the MQTT broker, then closes the network connection

Parameter:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance to activate or deactivate
Value:			
<div> <div>1÷maxClients</div> <div>:</div> <div>client instance range. To know maxClients value use test command</div> </div>			



**AT#MQDISC=?**

Test command reports the available range of values for parameters.



**AT#MQDISC=1**  
OK

Test command  
AT#MQDISC=?



#MQDISC: (1-maxClients)  
OK



## AT#MQCONN - Connect and Log in the MQTT Broker

This command performs the connection and login to the MQTT broker.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#MQCONN=<instanceNumber>,<clientId>,<userName>,<passWord>**

Set command performs network connection (using parameters set with #MQCFG) and sends the CONNECT packet to the MQTT broker.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance. The list of available clients is obtained with AT#MQEN? or the read command.
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<clientId>	string	-	identifies each MQTT client that connects to the MQTT broker. Maximum length of <clientId> is 512.
<userName>	string	-	authentication and authorization. Maximum length of <userName> is 512.
<passWord>	string	-	authentication and authorization.



Maximum length of <passWord> is 512.



If connection status is other than init state or connected, disconnect using #MQDISC before reconnecting using #MQCONN.



### AT#MQCONN?

Read command reports the configuration of active MQTT connections in the format:

#MQCONN=<instanceNumber>,<state>

Additional info:

►► The following tables shows the <state> values and meanings:

Client status: <state>	Normal/ Failure Events Values
0	client is initialized but not connected
1	client performed MQTT authentication with broker
2	connection closed or reset by the server
3	the answer to the ping request packet was not received
4	the CONNACK packet was not received
5	the CONNECT packet was not delivered
6	failure in the m2mb APIs
7	socket timeout or read error





AT#MQCONN=?

Test command reports the available range of values for parameters.



```
AT#MQCONN=1,myClientID,myUser,myPassword
OK
```

Scenario (1)

Read command

```
AT#MQCONN?
```

```
#MQCONN: 1,1
```

```
#MQCONN: 2,0
```

```
OK
```

Test command

```
AT#MQCONN=?
```

```
#MQCONN: (1-maxClient),512,512,512
```

```
OK
```

Scenario (2)

Read command

```
AT#MQCONN?
```

```
#MQCONN: 1,2
```

```
OK
```

Set command

```
AT#MQDISC=1
```

```
OK
```

Read command

```
AT#MQCONN?
```

```
#MQCONN: 1,0
```

```
OK
```



## AT#MQCFG2 - Configure Additional MQTT Parameters

This command sets the optional connection parameters for the selected MQTT client.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQCFG2=<instanceNumber>,<keepAlive>,<cleanSession>

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance. The list of available clients is obtained with AT#MQEN? or the read command.
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<keepAlive>	integer	60	timeout of periodic packet to keep connection open
Value: <div> 60÷3600 : timeout expressed in sec </div>			
<cleanSession>	integer	1	Indicates whether a persistent connection is required. Without a persistent connection, when the client is offline all information and



messages that are queued from a previous persistent session are lost.

Values:

1 : clean session

0 : persistent session



AT#MQCFG2?

Read command returns the configuration of all active MQTT clients in the format:

#MQCFG2: <instanceNumber>,<keepAlive>,<cleanSession>



AT#MQCFG2=?

Test command reports the available range of values for parameters.



Set command

AT# MQCFG2=1,60,1

OK

Read command

AT#MQCFG2?

#MQCFG2: 1,60,1

#MQCFG2: 2,70,1

OK

Test command

AT#MQCFG2=?

#MQCFG2: (1-maxClients),(60-3600),(0-1)



## AT#MQWCFG - Configure MQTT Last Will and Testament

This command sets Last Will and Testament for the selected MQTT client.

SIM Presence	Setting saved	Can be aborted
Required	No	No

AT#MQWCFG=<instanceNumber>,<willFlag>[,<willRetain>,<willQos>,<willTopic>,<willMsg>]

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance. The list of available clients is obtained with AT#MQEN? or the read command.
Value: <div> <div>1÷maxClients</div> <div>:</div> <div>client instance range. To know maxClients value use test command</div> </div>			
<willFlag>	integer	0	selects whether the client needs to specify a Last Will and Testament. If set to 0, this is the last parameter to be set.
Values: <div> <div>0</div> <div>:</div> <div>the client does not need to specify a Last Will and Testament</div> <div>1</div> <div>:</div> <div>the client needs to specify a Last Will and Testament</div> </div>			





	<willRetain>	integer 0	selects whether the Last Will message needs to be retained by the server
	Values: ..... 0 : the Last Will message does not need to be retained by the server ..... 1 : the Last Will message needs to be retained by the server .....		
	<willQos>	integer 0	Quality of Service of the Last Will message
	Value: ..... 0÷2 : Quality of Service range .....		
	<willTopic>	string -	Topic to publish the Last Will message to. Unused. Maximum length of <willTopic> is 256.
	<willMsg>	string -	Last Will message. Maximum length of <willMsg> is 1024.
AT#MQWCFG? Read command returns the Last Will and Testament (if any) of all active MQTT clients in the format: #MQWCFG:<instanceNumber>,<willFlag>[,<willRetain>,<willQos>,<willTopic>,<willMsg>]			
AT#MQWCFG=? Test command reports the available range of values for parameters.			





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

```
AT#MQWCFG=1,1,1,2,myLastWillTopic,myLastWillMessage  
OK
```

```
Read command  
AT#MQWCFG?  
#MQWCFG: 1,0  
#MQWCFG: 2,1,0,2,myTopic,myMessage  
OK
```

```
Test command  
AT#MQWCFG=?  
#MQWCFG: (1-maxClients),(0-1),(0-1),(0-2),256,1024  
OK
```



## AT#MQTCFG - Configure Timeout Parameters for MQTT Transmission

This command writes the timeout options for the specified client.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQTCFG=<instanceNumber>,<pktTimeout>

Parameters:

Name	Type	Default	Description
<instanceNumber>	string	N/A	selects the client instance. The list of available clients is obtained with AT#MQEN? or the read command.
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<pktTimeout>	integer	10	timeout of the packet delivery
Value: <div> 1÷60 : timeout range. Value expressed in seconds </div>			



AT#MQTCFG?

Read command returns the timeout configuration of all active MQTT clients in the format



#MQTCFG: <instanceNumber>,<pktTimeout>



AT#MQTCFG=?

Test command reports the available range of values for parameters



```
AT#MQTCFG=1,10
OK
```

```
Read command
AT#MQTCFG?
#MQTCFG: 1,5
#MQTCFG: 1,4
OK
```

```
Test command
AT#MQTCFG=?
#MQTCFG: (1-maxClients),(1-60)
OK
```



## AT#MQUNS - Unsubscribe from a Topic

This command revokes the subscription to a MQTT topic.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQUNS=<instanceNumber>,<topic>

Parameters:

Name	Type	Default	Description
<instanceNumber>	string	N/A	selects the client instance to activate or deactivate
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<topic>	string	-	name of the topic. Maximum length of <topic> is 256.



AT#MQUNS=?

Test command reports the available range of values for parameters.



AT#MQUNS=1,topicToUnsubscribe

OK

Test command

AT#MQUNS=?



#MQUNS: (1-maxClients),  
OK



## AT#MQSUB - Subscribe to a Topic

This command performs the subscription to a MQTT topic

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQSUB=<instanceNumber>,<topic>[,<qos>]

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance to activate or deactivate
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<topic>	string	-	name of the topic. Maximum length of <topic> is 256.
<qos>	integer	1	Configures qos for the subscription. This is an optional parameter. If qos is not specified, qos 1 is taken as default
Value: <div> 0÷2 : qos range </div>			





AT#MQSUB=?

Test command reports the available range of values for parameters.



```
AT#MQSUB=1,topicToSubscribe  
OK
```

```
AT#MQSUB=1,topicToSubscribe_2,0  
OK
```

```
Test command  
AT#MQSUB=?  
#MQSUB: (1-maxClients),256,(0-2)  
OK
```





## AT#MQPUBS - Publish ASCII String

This command publishes an ASCII string to the specified MQTT topic.

SIM Presence	Setting saved	Can be aborted
Required	No	No




AT#MQPUBS=<instanceNumber>,<topic>,<retain>,<qos>,<message>

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance to activate or deactivate
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<topic>	string	-	name of the topic. Maximum length of <topic> is 256.
<retain>	integer	N/A	specifies if the broker must retain this message or not
Values: <div> 0 : Not retained   1 : Retain </div>			



	<qos>	integer	N/A	specifies the Quality of Service of this message
	Value: ..... 0÷2 : Quality of Service range .....			
	<message>	string	-	message to publish on the topic. Maximum length of <message> can go up to 65536 depending on system memory available.
 <b>AT#MQPUBS=?</b> Test command reports the available range of values for parameters.				

</>

AT#MQPUBS=1,myTopic,0,0,myMessage  
 OK  
  
 Test command  
 AT#MQPUBS=?  
 #MQPUBS: (1-maxClients),256,(0-1),(0-2),65536  
 OK

## AT#MQREAD - Read Messages Received from the MQTT Broker

This command reads the message payload from the queue slot provided.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQREAD=<instanceNumber>,<mId>

After command line is terminated with <CR>, the module responds sending:

#MQREAD: <instanceNumber>,<topic>,<payload\_len>,

then the module prompts the following characters sequence:

<less\_than><less\_than><less\_than><carriage return><line feed> (IRA 60, 60, 60, 13, 10)

followed by the data

Parameters:

Name	Type	Default	Description
<instanceNumber>	string	N/A	selects the client instance to activate or deactivate
Value: <div> 1÷maxClients : client instance range. To know maxClients value use test command </div>			
<mId>	integer	N/A	message slot Id to be read. The read operation will free the slot resource.



Value:

1÷30 : message slot Id range

Additional info:

## ►► UNSOLICITED MESSAGE:

#MQRING - Received data on subscribed topic

When a message is received on the subscribed topic, an URC message is sent to all AT commands interfaces. There are 30 messages slots available for incoming messages, and it is responsibility of the user to keep them empty by reading them with #MQREAD.

If the message queue is full, and a new message arrives, the following URC #MQRING: 0 is received.

Otherwise, for normal messages, the URC format is:

#MQRING: <instanceNumber>,<mId>,<topic>,<len>

In the Unsolicited fields section are described the URC message parameters not described in the previous sections.

Unsolicited fields:

Name	Type	Description
<topic>	string	name of the topic from where the message was received
<len>	integer	length in bytes of the received payload



**AT#MQRD?**

Read command returns the unread messages count for each instance number for all active MQTT clients in the format:

#MQRD: <instanceNumber>,<unread>

**AT#MQRD=?**

Test command reports the available range of values for parameters.



```
AT#MQRD=1,2
#MQRD: 1,myTopic,10
<<<
0123456789
```

Read command  
AT#MQRD?  
#MQRD: 1,0  
#MQRD: 2,3  
OK

Test command  
AT#MQRD=?  
#MQRD: (1-maxClients),(1-30)  
OK



## AT#MQPUBSEXT - Publish Extension command

This command publishes data to the specified MQTT topic.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#MQPUBSEXT=<instanceNumber>,<topic>,<retain>,<qos>,<dataLen>

After entering AT#MQPUBSEXT=... command, and terminated the command line with <CR>, the module returns the following three characters sequence prompt, and waits for data to send:

<greater\_than><greater\_than><greater\_than> (see IRA character set: 62, 62, 62)

Now, data can be entered from TE, sized <dataLen> bytes. If user does not enters any input for 10 seconds, command is terminated with error.

If sending ends successfully and acknowledgment is received for QOS > 0, the response will be OK, otherwise an error will be reported.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance to activate or deactivate
Value:			
<div> <div>1÷maxClients</div> <div>:</div> <div>client instance range. To know maxClients value use test command</div> </div>			



<topic>	string	-	name of the topic. Maximum length of <topic> is 256
<retain>	integer	N/A	specifies if the broker must retain this message or not
Values: ..... 0 : Not retained ..... 1 : Retain .....			
<qos>	integer	N/A	specifies the Quality of Service of this message
Value: ..... 0÷2 : Quality of Service range .....			
<dataLen>	integer	-	Length of message to publish on the topic. Maximum length of <dataLen> can go up to 65536 depending on system memory available.



AT#MQPUBSEXT=?

Test command reports the available range of values for parameters.





Publish 100 byte message

```
AT#MQPUBSEXT=1,myTopic,0,0,100
```

>>>

OK

Test command

```
AT#MQPUBSEXT=?
```

```
#MQPUBSEXT: (1-maxClients),256,(0-1),(0-2),(0-65536)
```

OK





## MQTT-SN



## AT#MQSNEN - Enable MQTT-SN feature

This command initializes a MQTT-SN client and allocates the necessary resources.

SIM Presence	Setting saved	Can be aborted
Not required	No	No





AT#MQSNEN=<instanceNumber>,<enable>


Set command enables/disables the MQTT-SN client for further configuration and usage

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance to activate or deactivate. The list of available clients is obtained with the read command.  To know maxClients value use test command.
Value:			
<div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<enable>	integer	N/A	Sets if the selected client must be activated or deactivated
Values:			
<div> <div>1</div> <div>:</div> <div>Enable</div> </div>			
<div> <div>0</div> <div>:</div> <div>Disable</div> </div>			



	<p><b>AT#MQSNEN?</b></p> <p>Read command returns the status of the MQTT-SN stack in the format</p> <p>#MQSNEN: &lt;instanceNumber&gt;,&lt;enabled&gt;</p>	
	<p><b>AT#MQSNEN=?</b></p> <p>Test command reports the available range of values for parameters.</p>	

	<div data-bbox="300 943 1058 1727"> <ul style="list-style-type: none"> <li>Set example AT#MQSNEN=1,1  OK</li> <li>Read example AT#MQSNEN? #MQSNEN: 1,1 #MQSNEN: 2,0 #MQSNEN: 3,0 #MQSNEN: 4,0  OK</li> <li>Test example (refer to module output for real ranges) AT#MQSNEN=? #MQSNEN: (1-maxClients),(0-1)  OK</li> </ul> </div>
---	--



## AT#MQSNWCFG - Configure MQTT-SN last will and testament

This command sets Last Will and Testament for the selected MQTT-SN client

SIM Presence	Setting saved	Can be aborted
Not required	No	No

AT#MQSNWCFG=

<instanceNumber>,<will\_flag>[,<will\_retain>,<will\_qos>,<will\_topic>,<will\_msg>]

Set command writes the parameters for the specified client

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of available clients is obtained with AT#MQSNEN? or the read command.  To know maxClients value use test command.
Value: <div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<will_flag>	integer	0	Selects whether the client needs to specify a Last Will and Testament. If set to 0, this is the last parameter to be set.
Values:			



		0	:	The client does not need to specify a Last Will and Testament
		1	:	The client needs to specify a Last Will and Testament
<will_retain>	integer	0		Selects whether the Last Will message needs to be retained by the server.
	Values:			
		0	:	The Last Will message does not need to be retained by the server
		1	:	The Last Will message needs to be retained by the server
<will_qos>	integer	0		Quality of Service of the Last Will message
	Values:			
		0	:	Default value
		0÷2	:	Quality of Service
<will_topic>	string	-		Topic to publish the Last Will message to. Maximum size is 256.



<will_msg>	string	-	Last Will message. Maximum size is 1024.
------------	--------	---	--

#### AT#MQSNWCFG?

Read command returns the Last Will and Testament (if any) of all active MQTT-SN clients

in the format

#MQSNWCFG:

<instanceNumber>,<will\_flag>[,<will\_retain>,<will\_qos>,<will\_topic>,<will\_message>]

#### AT#MQSNWCFG=?

Test command reports the available range of values for parameters.



- Set example

```
AT#MQSNWCFG=1,0
```

```
OK
```

```
AT#MQSNWCFG=1,1,1,2,myLastWillTopic,myLastWillMessage
```

```
OK
```

- Read example

```
AT#MQSNWCFG?
```

```
#MQSNWCFG: 1,0
```

```
#MQSNWCFG: 1,1,1,2,myLastWillTopic,myLastWillMessage
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNWCFG=?
```

```
#MQSNWCFG: (1-maxClients),(0-1),(0-1),(0-2),256,1024
```



OK



# AT#MQSNSUB - Subscribe to a Topic

Performs the subscription to a MQTT-SN topic.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQSNSUB=<instanceNumber>,<qos>,<topic\_type>,<topic/topic\_id>

Subscribes to a topic.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of active clients is obtained with AT#MQSNCONN?  To know maxClients value use test command.
Value: <div> 1÷maxClients : client instance Number </div>			
<qos>	integer	N/A	Desired Quality of service for the topic to be subscribed.
Value: <div> 0÷2 : Quality of service </div>			
<topic_type>	integer	0	Type of topic to be subscribed





Values:

0 : Normal topic

1 : Pre-defined topic

2 : Short topic

<topic/topic_id>	string	-	Name of the topic or short topic or pre-defined topic id. Maximum length supported is 256.
------------------	--------	---	--

Additional info:

- ▶▶ In case of success, execution command returns qos granted and topic id received (in case of normal topic) in the format:  
#MQSNSUB: <qos>[,<topic\_id>]



AT#MQSNSUB=?

Test command reports the available range of values for parameters



- Set example  
AT#MQSNSUB=1,1,0,topicToSubscribe  
#MQSNSUB: 1,1  
  
OK  
  
AT#MQSNSUB=1,1,1,5  
#MQSNSUB: 1



OK

AT#MQSNSUB=1,1,2,ab  
#MQSNSUB: 1

OK

- Test example (refer to module output for real ranges)

AT#MQSNSUB=?  
#MQSNSUB: (1-maxClients),(0-2),(0-2),256

OK



## AT#MQSNCFG - Configure MQTT-SN parameters

This command sets the connection parameters for the selected MQTT-SN client

SIM Presence	Setting saved	Can be aborted
Not required	No	No





AT#MQSNCFG=<instanceNumber>,<hostname>,<port>,<cid>


Set command writes the MQTT-SN parameters for the specified client

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of available clients is obtained with AT#MQSNEN? or the read command.  To know maxClients value use test command
Value:  ..... 1÷maxClients : client instance Number .....			
<hostname>	string	-	URL of the MQTT-SN Gateway. Maximum length of URL is 512.
<port>	integer	N/A	UDP port of the MQTT-SN Gateway
Value:  ..... 1÷65535 : UDP port .....			



	<div> <div>&lt;cid&gt;</div> <div>integer</div> <div>N/A</div> <div>PDP Context ID to be used for the connection</div> </div> <div> <div>Value:</div> <div> <div>1÷6</div> <div>:</div> <div>PDP Context ID</div> </div> </div>
	<p><b>AT#MQSNCFG?</b></p> <p>Read command returns the configuration all active MQTT-SN clients in the format #MQSNCFG: &lt;instanceNumber&gt;,&lt;hostname&gt;,&lt;port&gt;,&lt;cid&gt;</p>
	<p><b>AT#MQSNCFG=?</b></p> <p>Test command reports the available range of values for parameters</p>

	<div> <div> <ul style="list-style-type: none"> <li>Set example</li> </ul> </div> <div> <pre>AT#MQSNCFG=1,api.myGateway.com,11000,3</pre> <pre>OK</pre> </div> <div> <ul style="list-style-type: none"> <li>Read example</li> </ul> </div> <div> <pre>AT#MQSNCFG?</pre> <pre>#MQSNCFG: 1,api.myGateway.com,11000,1</pre> <pre>#MQsNCFG: 2, Gateway.com,11000,1</pre> <pre>OK</pre> </div> <div> <ul style="list-style-type: none"> <li>Test example (refer to module output for real ranges)</li> </ul> </div> <div> <pre>AT#MQSNCFG=?</pre> <pre>#MQSNCFG: (1-maxClients),512,(1-65535),(1-6)</pre> </div> </div>
---	---



OK



## AT#MQSNTCFG - Configure timeout parameters for MQTT-SN transmission

This command sets the timeout options for the selected MQTT-SN client.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#MQSNTCFG=<instanceNumber>,<pkt\_timeout>

Set command writes the timeout options for the specified client.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of available clients is obtained with AT#MQSNEN? or the test command.  To know maxClients value use test command.
Value:			
1÷maxClients : client instance Number			
<pkt_timeout>	integer	10	Timeout of the packet delivery.
Values:			
10 : Default timeout 10 seconds			
1÷60 : Timeout in seconds			





### AT#MQSNTCFG?

Read command returns the timeout configuration of all active MQTT-SN clients in the format

#MQSNTCFG: <instanceNumber>,<pkt\_timeout>



### AT#MQSNTCFG=?

Test command reports the available range of values for parameters.



- Set example

```
AT#MQSNTCFG=1,10
```

```
OK
```

- Read example

```
AT#MQSNTCFG?
```

```
#MQSNTCFG: 1,5
```

```
#MQSNTCFG: 1,20
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNTCFG=?
```

```
#MQSNTCFG: (1-maxClients),(1-60)
```

```
OK
```



## AT#MQSNDISC - Log out and disconnect from the MQTT-SN Gateway

Performs the logout and disconnection from to the MQTT-SN Gateway.

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#MQSNDISC=<instanceNumber>**

Disconnects gracefully from the MQTT-SN Gateway, then closes the network connection and socket.

Parameter:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of active clients is obtained with AT#MQSNEN?  To know maxClients value use test command.
Value:			
<div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			



**AT#MQSNDISC=?**

Test command reports the available range of values for parameters.





&lt;/&gt;

- Set example

```
AT#MQSNDISC=1
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNDISC=?
```

```
#MQSNDISC: (1-maxClients)
```

```
OK
```



# AT#MQSNUNS - Unsubscribe from a Topic

Revokes the subscription to a MQTT-SN topic

SIM Presence	Setting saved	Can be aborted
Required	No	No




AT#MQSNUNS=<instanceNumber>,<topic\_type>,<topic/topic\_id>

Unsubscribes from a topic

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of active clients is obtained with AT#MQSNCONN?  To know maxClients value use test command.
Value: <div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<topic_type>	integer	0	Type of topic
Values: <div> <div>0</div> <div>:</div> <div>Normal topic</div> </div> <div> <div>1</div> <div>:</div> <div>Pre-defined topic</div> </div> <div> <div>2</div> <div>:</div> <div>Short topic</div> </div>			



	<div> <div>&lt;topic/topic_id&gt;</div> <div>string</div> <div>-</div> <div>Name of the topic or short topic or pre-defined topic id. Maximum size is 256.</div> </div>	
	<div> <div>AT#MQSNUNS=?</div> <div>Test command reports the available range of values for parameters</div> </div>	

<div> <div>&lt;/&gt;</div> </div>	<div> <div> <ul style="list-style-type: none"> <li>Set example</li> </ul> </div> <div> <div>AT#MQSNUNS=1,0,topicToUnsubscribe</div> <div>OK</div> </div> <div> <ul style="list-style-type: none"> <li>Test example (refer to module output for real ranges)</li> </ul> </div> <div> <div>AT#MQSNUNS=?</div> <div>#MQSNUNS: (1-maxClients),(0-2),256</div> <div>OK</div> </div> </div>
-----------------------------------	---



## AT#MQSNCFG2 - Configure additional MQTT-SN parameters

This command sets the optional connection parameters for the selected MQTT-SN client

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#MQSNCFG2=<instanceNumber>,<keepalive>,<clean\_session>

Set command writes the MQTT-SN parameters for the specified client

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of available clients is obtained with AT#MQSNEN? or the read command.  To know maxClients value use test command.
Value:  <div> 1÷maxClients : client instance Number </div>			
<keepalive>	integer	60	Timeout of periodic packet to keep connection open
Values:  <div> 60÷14400 : Timeout in seconds </div>			



<clean_session>	integer	1	Indicates whether or not a persistent connection is required. Without a persistent connection, when the client is offline all information and messages that are queued from a previous persistent session are lost.
-----------------	---------	---	---

Values:

1 : clean session

0 : persistent session



AT#MQSNCFG2?

Read command returns the configuration all active MQTT-SN clients in the format #MQSNCFG2: <instanceNumber>,<keepalive>,<clean\_session>



AT#MQSNCFG2=?

Test command reports the available range of values for parameters.



- Set example

```
AT#MQSNCFG2=1,120,1
```

```
OK
```

```
AT#MQSNCFG2=2,90,0
```

```
OK
```

- Read example



```
AT#MQSNCFG2?  
#MQSNCFG2: 1,120,1  
#MQSNCFG2: 2,90,0
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNCFG2=?  
#MQSNCFG2: (1-maxClients),(60-14400),(0-1)
```

```
OK
```



## AT#MQSNREG - Register to a Topic

Performs the registration to a MQTT-SN topic

SIM Presence	Setting saved	Can be aborted
Required	No	No



**AT#MQSNREG=<instanceNumber>,<topic>**

Client sends register message to the Gateway for requesting a topic id value for the included topic name. Command displays topic id received upon success.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of active clients is obtained with AT#MQSNCONN?  To know maxClients value use test command.
Value: ..... 1÷maxClients : client instance Number .....			
<topic>	string	-	Name of the topic. Maximum length supported is 256.

Additional info:

- ▶▶ In case of success, execution command returns topic id received for the specified topic in the format:  
#MQSNREG: <topic\_id>





AT#MQSNREG=?

Test command reports the available range of values for parameters



- Set example

```
AT#MQSNREG=1,topicToRegister
#MQSNREG: 1
```

OK

- Test example (refer to module output for real ranges)

```
AT#MQSNREG=?
#MQSNREG: (1-maxClients),256
```

OK





## AT#MQSNPUBS - Publish to the specific topic

Publishes an ASCII string to the specified MQTT-SN topic

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQSNPUBS=<instanceNumber>,<topic\_type>,<topic/ topicId>,<retain>,<qos>,<message>

Publishes a string to a topic

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of active clients is obtained with AT#MQSNEN?  To know maxClients value use test command.
Value:			
<div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<topic_type>	integer	N/A	Type of topic/topic id
Values:			
<div> <div>0</div> <div>:</div> <div>Normal topic id (received from AT#MQSNREG)</div> </div>			
<div> <div>1</div> <div>:</div> <div>Pre-defined topic id</div> </div>			



2 : Short topic .....			
<topic/topicId>	string	-	Normal topic id or short topic or pre-defined topic id. Maximum length is 2.
<retain>	integer	N/A	Specifies if the Gateway must retain this message or not
Values: ..... 0 : Do not retain  1 : Must retain .....			
<qos>	integer	N/A	Specifies the Quality of Service of this message
Values: ..... 0 : At most once delivery  1 : At least once delivery  2 : Exactly once delivery  3 : Publish with QoS -1 .....			
<message>	string	-	Message to publish on the topic. Maximum 1024 characters, printable ASCII.





In case QoS -1, only predefined topics and short topics are allowed



AT#MQSNPUBS=?

Test command reports the available range of values for parameters



- Set example

```
AT#MQSNPUBS=1,0,1,0,0,myMessage
```

```
OK
```

```
AT#MQSNPUBS=1,1,ab,0,1,myMessage
```

```
OK
```

```
AT#MQSNPUBS=1,2,1,0,1,myMessage
```

```
OK
```

```
AT#MQSNPUBS=1,1,ab,0,3,myMessage
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNPUBS=?
```

```
#MQSNPUBS: (1-maxClients),(0-2),2,(0-1),(0-3),1024
```

```
OK
```



## AT#MQSNREAD - Read messages received from the MQTT-SN Gateway

Read the message payload from the queue slot provided.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQSNREAD=<instanceNumber>,<mId>

Read the message from the slot and for the provided client. The command will respond with #MQSNREAD: <instanceNumber><topic\_type>,<topic\_id>,<payload\_len>

Then the device shall prompt a characters sequence

<less\_than><less\_than><less\_than><carriage return><line feed>

(IRA 60, 60, 60, 13, 10)

followed by the data

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	-	Select the client instance. The list of active clients is obtained with AT#MQSNEN?  Values: 1..<maxClients>  To know maxClients value use test command.
<mId>	integer	N/A	The message slot Id to be read. The read operation will free the slot resource
Value:			
<div> <div>1÷30</div> <div>:</div> <div>message slot Id to be read</div> </div>			



#### Additional info:

- When a message is received on the subscribed topic, an URC message is sent to all AT commands interfaces. There are 30 messages slots available for incoming messages, and it is responsibility of the user to keep them empty by reading them with #MQSNREAD. If the message queue is full, and a new message arrives, an URC

#MQSNRING: 0

is received.

Otherwise, for normal messages, the URC format is

#MQSNRING: <instanceNumber>,<mid>,<topic\_type>,<topic/topicId>,<len>


#### Unsolicited fields:

Name	Type	Description
<instanceNumber>	integer	Selects the client instance. The list of active clients is obtained with AT#MQSNEN? Value: 1..<maxClients> To know maxClients value use test command.
<mId>	integer	message slot id number, to be used to read the message content with AT#MQSNREAD command. Value: 1-30 : message slot id number
<topic_type>	integer	Type of topic/topic id. Values:




		<div>0 : Normal topic id (received from AT#MQSNREG)</div> <div>1 : Pre-defined topic id</div> <div>2 : Short topic</div>
	<topic/topicId>	string    Normal topic id or short topic or pre-defined topic id.
	<len>	integer    Length in bytes of the received payload

	<b>AT#MQSNREAD?</b> Read command returns the unread messages count for each instance number for all active MQTT-SN clients in the format #MQSNREAD: <instanceNumber>,<unread>
---	---

	<b>AT#MQSNREAD=?</b> Test command reports the available range of values for parameters.
---	--

</>

- Set example

```

AT#MQSNREAD=1,2
#MQSNREAD: 1,1,ab,10
<<<
0123456789

OK

```



- Read example

AT#MQSNREAD?

#MQSNREAD: 1,0

#MQSNREAD: 2,3

OK

- Test example (refer to module output for real ranges)

AT#MQSNREAD=?

#MQSNREAD: (1-maxClients),(1-30)

OK



## AT#MQSNWTUP - Update MQTT-SN last will and testament Topic

Set Last Will and Testament for the selected MQTT-SN client

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#MQSNWTUP=<instanceNumber><will\_flag>[,<will\_retain>,<will\_qos>,<will\_topic>]

Send will topic update packet to the Gateway

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The list of available clients is obtained with AT#MQSNEN? or the read command.  To know maxClients value use test command
Value:  <div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<will_retain>	integer	0	Selects whether the Last Will message needs to be retained by the server
Values:  <div> <div>0</div> <div>:</div> <div>The Last Will message does not need to be retained by the server</div> </div> <div> <div>1</div> <div>:</div> <div>The Last Will message needs to be retained by the server</div> </div>			
<will_qos>	integer	0	Quality of Service of the Last Will message





Value:

0÷2

:

Quality of Service

<will\_topic>

string

-

Topic to publish the Last Will message to



AT#MQSNWTUP=?

Test command reports the available range of values for parameters



- Set example

AT#MQSNWTUP=1,0

OK

AT#MQSNWTUP=1,1,1,2,myLastWillTopic

OK

- Test example (refer to module output for real ranges)

AT#MQSNWTUP=?

#MQSNWTUP: (1-maxClients),(0-1),(0-1),(0-2),

OK



## AT#MQSNWMUP - Update MQTT-SN last will and testament Message

Set Last Will and Testament for the selected MQTT-SN client

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#MQSNWMUP=<instanceNumber>,<will\_msg>

Send will message update packet to the Gateway

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	-	Selects the client instance. The list of available clients is obtained with AT#MQSNEN? or the read command.  Value: 1..<maxClients>  To know maxClients value use test command.
<will_msg>	string	-	Message of the Last Will message



AT#MQSNWMUP=?

Test command reports the available range of values for parameters



- Set example

```
AT#MQSNWMUP=1,myLastWillMessage
```

```
OK
```



- Test example (refer to module output for real ranges)

AT#MQSNWMUP=?

#MQSNWMUP: (1-maxClients),

OK



## AT#MQSNSTATE - Set MQTT-SN client state

This command initializes a MQTT-SN client and allocates the necessary resources.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#MQSNSTATE=<instanceNumber>,<state>[,<duration>]


Set command changes the MQTT-SN client state to "asleep", "awake" or "active" state.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	-	Selects the client instance to activate or deactivate. The list of available clients is obtained with the read command.  Value: 1..<maxClients>  To know maxClients value use test command.
<state>	integer	N/A	Desired state of the MQTT-SN client.
<p>Values:</p> <p>.....</p> <p>0 : Active state. This is the normal connected state in which all the MQTT-SN operations can be performed. This option is valid only if client is in asleep state</p> <p>1 : Asleep State: Client can enter asleep state whenever they are not active, and can become active whenever they have data to send or to receive. In this state, no MQTT-SN operation can be performed except sending keep-alive packets. User has to specify periodic duration of sleep state. Else, the</p>			




<p>command fails. This option is valid only if client is in active state.</p> <p>2 : Awake state: Required only to go to asleep state. Sleeping client will send a keep-alive packet to the gateway, receive all the buffered Publish packets sent by the gateway and will again go to asleep state. This option is valid only if client is in asleep state.</p> <p>.....</p>		
<p>&lt;duration&gt;</p>	<p>integer -</p>	<p>Sets the period of clients sleep in seconds. After expiry of this duration, the client sends a keep-alive packet to the gateway, receives all the buffered Publish packet sent by the gateway and again goes to asleep state. This parameter is mandatory if user is setting value of &lt;state&gt; parameter to 1.</p>



**AT#MQSNSTATE?**

Read command returns the state of all initialised MQTT-SN clients in the format #MQSNSTATE: <instanceNumber>,<state>[,<duration>]



**AT#MQSNSTATE=?**

Test command reports the available range of values for parameters.



- Set example

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



```
AT#MQSNSTATE=1,1,60
```

```
OK
```

```
AT#MQSNSTATE=1,2
```

```
#MQSNRING:1,5,2,ab,10
```

```
OK
```

- Read example

```
AT#MQSNSTATE?
```

```
#MQSNSTATE: 1,1,60
```

```
#MQSNSTATE: 2,0
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNSTATE=?
```

```
#MQSNSTATE: (1-maxClients),(0-2),(60-3600)
```

```
OK
```



## AT#MQSNSOCK - Enable/disable MQTT-SN client socket

Performs the connection and login to the MQTT-SN Gateway

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQSNSOCK=<instanceNumber>,<create>

Set command creates/closes UDP socket for MQTT-SN client. User can either directly Publish on QoS -1 after creating the socket or can connect to the gateway and then perform other MQTT-SN operations.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The number of available clients is obtained with the test command.  To know maxClients value use test command.
Value:  ..... 1÷maxClients : client instance Number .....			
<create>	integer	N/A	Sets if the selected client socket must be created or closed
Values:  ..... 1 : Create socket			



0 : Close socket. To be used when client is in socket connected state



AT#MQSNSOCK?

Read command reports the socket state of active MQTT-SN clients in the format:

#MQSNSOCK =<instanceNumber>,<socket\_created>



AT#MQSNSOCK=?

Test command reports the available range of values for parameters



- Set example

```
AT#MQSNSOCK=1,1
```

```
OK
```

- Read example

```
AT#MQSNSOCK?
```

```
#MQSNSOCK: 1,1
```

```
#MQSNSOCK: 2,0
```

```
OK
```

- Test example (refer to module output for real ranges)

```
AT#MQSNSOCK=?
```

```
#MQSNSOCK: (1-maxClients),(0-1)
```

```
OK
```







## AT#MQSNCONN - Connect and log in the MQTT-SN Gateway

Performs the connection and login to the MQTT-SN Gateway

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#MQSNCONN=<instanceNumber>,<clientID>

Set command performs network connection (using parameters set with #MQSNCFG) and sends the CONNECT packet to the MQTT-SN Gateway.

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The number of available clients is obtained with the test command.  To know maxClients value use test command.
Value: <div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<clientID>	string	-	Client identifier. Identifies each MQTT-SN client that connects to the MQTT-SN Gateway. Maximum length is 23.



A URC message in the following format is sent to notify user about asynchronous disconnect:

#MQSNCONN: <instanceNumber>,DISCONNECT



Where, <instanceNumber> is the client instance of the MQTT-SN client disconnected.



If #MQSNCONN URC is received, socket is closed internally and client moves to init state. User can establish the connection again with AT#MQSNSOCK and AT#MQSNCONN commands.



## AT#MQSNCONN?

Read command reports the configuration of active MQTT-SN connections in the format:  
#MQSNCONN=<instanceNumber>,<state>

Additional info:



Parameter:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	Selects the client instance. The number of available clients is obtained with the test command.  To know maxClients value use test command.
Value:			
<div> <div>1÷maxClients</div> <div>:</div> <div>client instance Number</div> </div>			
<state>	integer	N/A	Client status.
Values:			



- 
- 0 : client is in init state
  - 1 : socket is created
  - 2 : client is connected
  - 3 : connection closed by the gateway. Issue AT#MQSNSOCK and AT#MQSNCONN to open connection again
  - 4 : Ping request failed
  - 5 : Connect request timed out
  - 6 : Client is in "asleep" state
  - 7 : Client is in "awake" state
  - 8 : Client is in unknown state. Deinit client and open it again with AT#MQSNEN
- 



AT#MQSNCONN=?

Test command reports the available range of values for parameters



- Set example

AT#MQSNCONN=1,myClientID



- Read example

```
AT#MQSNCONN?  
#MQSNCONN: 1,2  
#MQSNCONN: 2,3
```

OK

- Test example (refer to module output for real ranges)

```
AT#MQSNCONN=?  
#MQSNCONN: (1-maxClients),23
```

OK



# GNSS



## GNSS Configuration



## AT\$GPSCFG - Set GNSS Configuration Parameters

This command sets the following GNSS parameters: WWAN/GNSS startup priority, TBF (Time Between Fix), constellation and WWAN/GNSS runtime priority and static pinning operation.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT\$GPSCFG=<parameter>,<value>

Parameters:

Name	Type	Default	Description
<parameter>	integer	N/A	selects the configuration parameter to be set
<p>Values:</p> <hr/> <p>0 : set WWAN/GNSS startup priority</p> <p>1 : set TBF</p> <p>2 : set constellation</p> <p>3 : set WWAN/GNSS runtime priority</p> <p>4 : set static pinning operation</p> <hr/>			
<value>	integer	-	value depends on the first parameter. See Additional info section.

Additional info:

- <parameter>=0, in this case the <value> assumes the meaning of <startup priority>.





Name	Type	Default	Description
<startup priority>	integer	1	it selects the priority, stored in NVM and effective from module startup
<div>Values:</div> <div><div>0</div><div>:</div><div>priority GNSS</div></div> <div><div>1</div><div>:</div><div>priority WWAN</div></div>			

►► <parameter>=1, in this case the <value> assumes the meaning of <TBF>.

Name	Type	Default	Description
<TBF>	integer	1	it defines the Time Between Fix
Value: <div><div>1÷4294967</div><div>:</div><div>expressed in seconds</div></div>			

►► <parameter>=2, in this case the <value> assumes the meaning of <constellation>.

Name	Type	Default	Description
<constellation>	integer	1	selects the constellation



#### Values:

- 0 : the constellation is selected automatically based on Mobile Country Code (MCC) of camped network
- 1 : GPS+GLO
- 2 : GPS+GAL
- 3 : GPS+BDS
- 4 : GPS+QZSS


►► <parameter>=3, in this case the <value> assumes the meaning of <runtime priority>.

Name	Type	Default	Description
<runtime priority>	integer	A	it selects the priority runtime
<h4>Values:</h4> <ul style="list-style-type: none"> <li>0 : priority GNSS</li> <li>1 : priority WWAN</li> </ul>			

►► <parameter>=4, in this case the <value> assumes the meaning of <static pinning>.




Name	Type	Default	Description
<static pinning>	integer	1	Sets the static pinning operation
Values:			
.....			
0 : Disable static pinning			
1 : Enable static pinning			
.....			

 WWAN/GNSS startup priority is stored in NVM. This is the priority setting used from the module startup.

It is possible to change priority runtime using third parameter WWAN/GNSS runtime priority.

At the startup, runtime priority is equal to startup priority (stored in NVM).

 For WWAN/GNSS startup priority, TBF (Time Between Fix), constellation and static pinning a reboot is needed to make effective the setting.



#### AT\$GPSCFG?

Read command returns current values of <startup priority>, <TBF>, <constellation>, <runtime priority> and <static pinning> in format:

\$GPSCFG: <startup priority>,<TBF>,<constellation>,<runtime priority>, <static pinning>



#### AT\$GPSCFG=?

Test command returns supported values range of <parameter>,<priority>, <TBF>, <constellation>, <runtime priority> and <static pinning>



&lt;/&gt;

- Set WWAN/GNSS Startup Priority, TBF (Time Between Fix) and constellation. A reboot is needed to make effective the setting.

Get the current values

AT\$GPSCFG?

\$GPSCFG: 1,1,1,1

OK

Set new WWAN/GNSS Startup Priority value

AT\$GPSCFG=0,0

OK

Set 4321s as new TBF value

AT\$GPSCFG=1,4321

OK

Set new constellations GPS+GAL

AT\$GPSCFG=2,2

OK

Until a reboot is done old values remain the current values

AT\$GPSCFG?

\$GPSCFG: 1,1,1,1

OK

A reboot is needed to make effective the setting

AT#REBOOT

OK

New values are the new current values

AT\$GPSCFG?

\$GPSCFG: 0,4321,2,0



OK

Enable GNSS with the new setting

AT\$GPSP=1

OK

- Set WWAN/GNSS runtime priority. It does not need a reboot to make effective the setting.

Get the current values

AT\$GPSCFG?

\$GPSCFG: 1,1,1,1

OK

Set new WWAN/GNSS runtime priority value

AT\$GPSCFG=3,0

OK

Get the current values

AT\$GPSCFG?

\$GPSCFG: 1,1,1,0

OK

Enable GNSS with the new setting

AT\$GPSP=1

OK



## GNSS Receiver



## AT\$GPSRST - Restore Default GPS Parameters

This command resets the GNSS parameters to "Factory Default" configuration

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT\$GPSRST

Set command resets the GNSS parameters to "Factory Default" configuration and stores them in the NVM of the cellular modules



### AT\$GPSRST=?

Test command returns the OK result code



The module must be restarted to use the new configuration

Only GNSS parameters relative to the following AT commands can be reset in NVM: \$GPSP, \$GPSNMUN and \$GPSNMUNEX.



## AT\$GPSSAV - Save GNSS Parameters Configuration

This command stores the current GNSS parameters in the NVM of the cellular module

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT\$GPSSAV

Execution command stores the current GNSS parameters in the NVM of the cellular module



### AT\$GPSSAV=?

Test command returns the OK result code



The module must be restarted to use the new configuration.



Only GNSS parameters relative to the following AT commands can be saved in NVM: \$GPSP, \$GNSSNMEA, \$GPSNMUN and \$GPSNMUNEX





## AT\$GPSP - GNSS Controller Power Management

This command powers on/off GNSS controller .

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



**AT\$GPSP=<status>**

The set command manages the power-up/power-down of the GNSS controller.

Parameter:

Name	Type	Default	Description
<status>	string	0	indicates the power status that has to be set.
<p>Values:</p> <p>.....</p> <p>0 : GNSS controller is powered down</p> <p>1 : GNSS controller is powered up</p> <p>.....</p>			



Power up clears GPS memory and then starts the GPS receiver. GPS data cleaning is performed on the base of the current value of the <reset\_type> parameter (see \$GPSR).



GPS operation mode is performed on the base of the current values of \$GPSSLR configuration (see \$GPSSLR).



**AT\$GPSP?**

The read command reports the current value of the <status> parameter, in the format:

\$GPSP: <status>



**AT\$GPSP=?**

The test command reports the supported values range for parameter <status>.





<status> value is stored through \$GPSSAV command.



GNSS controller is powered down

```
AT$GPSP=0
```

```
OK
```



## GNSS General Management



## AT\$GPSSW - GNSS Software Version

This command provides the GNSS module software version.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT\$GPSSW

Execution command returns the GNSS module software version in the format:

\$GPSSW: <swVersion>



### AT\$GPSSW?

Read command has the same behavior as the execution command.



### AT\$GPSSW=?

Test command returns the OK result code



## AT\$GPSR - Reset the GPS Controller

This command resets the GNSS controller.

SIM Presence	Setting saved	Can be aborted
Not required	Other	No



**AT\$GPSR=<resetType>**

Execution command allows to reset the GNSS controller.

Parameter:

Name	Type	Default	Description
<resetType>	integer	N/A	set the type of GNSS controller reset.

Values:

- 0 : Factory Reset: this option clears all the GNSS memory including Clock Drift and Extended Ephemeris files stored into flash memory.
- 1 : Coldstart (No Almanac, No Ephemeris): this option clears all data that is currently stored in the internal memory of the GNSS receiver, including Last Position, Almanac, Ephemeris and Time. All assistance data including XTRA Ephemeris, almanac, SV health etc will be deleted. However, the stored Clock Drift and Extended Ephemeris are retained.
- 2 : Warmstart (No ephemeris): this option clears Ephemeris and Last Position only. Almanac and Extended Ephemeris are retained.
- 3 : Hotstart (with stored Almanac and Ephemeris): the GNSS receiver restarts by using all data that is currently stored in the internal memory: valid



Almanac, Ephemeris and Extended Ephemeris are therefore retained and used.



At the moment a Cold Start is performed when Factory Reset is selected.



AT\$GPSR=?

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



```
Factory reset
AT$GPSR=0
OK
```



## AT\$GPSDPO - GNSS Set DPO

Set command sets the Dynamic Power Optimization (DPO) Control value in NV item 05596.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT\$GPSDPO=<DPO>

Parameter:

Name	Type	Default	Description
<DPO>	integer	2	enable/disable DPO
Values: <div> <div>0 : DPO shall be disabled</div> <div>1 : DPO shall be enabled with dynamic duty cycle</div> <div>2 : DPO shall be enabled only if module is not connected to an external power source (not running on battery)</div> </div>			



Only GPS and GLONASS support DPO mode.



<DPO> = 2 is equivalent to <DPO> = 1 (DPO enabled) due to External Power Source implementation.



AT\$GPSDPO?

Read command returns the current setting for DPO, in the format:

\$GPSDPO: <DPO>





AT\$GPSDPO=?

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



DPO is enabled, GNSS 1PPS signal output is disabled.



New setting is applicable across device cycles.





---

## GNSS Positioning Information



## AT\$GPSNMUN - Unsolicited NMEA Data Configuration

Set command activates 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.



[1] NMEA 0183 Standard

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT\$GPSNMUN=<enable>[,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>]

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 second GNSS data stream format, and reserve the AT interface port only for the GNSS data stream .....	
	<GGA> integer 0	enables/disables the presence of the Global Positioning System Fix Data NMEA sentence (GGA) in the GNSS data stream.	
	Values:	..... 0 : disable 1 : enable .....	
	<GLL> integer 0	enable/disable the presence of the Geographic Position - Latitude/Longitude NMEA sentence (GLL) in the GNSS data stream.	
	Values:	..... 0 : disable 1 : enable .....	
	<GSA> integer 0	enable/disable the presence of the GNSS DOP and Active Satellites NMEA sentence (GSA) in the GNSS data stream.	
	Values:	..... 0 : disable	



	1	:	enable	
.....				
<GSV>	integer	0	enable/disable the presence of the Satellites in View NMEA sentence (GSV) in the GNSS data stream.	
Values:				
.....				
	0	:	disable	
	1	:	enable	
.....				
<RMC>	integer	0	enable/disable the presence of the Recommended Minimum Specific GNSS Data NMEA sentence (RMC) in the GNSS data stream.	
Values:				
.....				
	0	:	disable	
	1	:	enable	
.....				
<VTG>	integer	0	enable/disable the presence of the GNSS Course Over Ground and Ground Speed NMEA sentence (VTG) in the GNSS data stream.	
Values:				
.....				
	0	:	disable	
	1	:	enable	
.....				



Additional info:

- ▶▶ <enable>=1, GNSS data stream format:  
\$GPSNMUN: <NMEA SENTENCE 1><CR><LF>  
...  
\$GPSNMUN: <NMEA SENTENCE N><CR><LF>  
...
- ▶▶ <enable>=2, GNSS data stream format:  
<NMEA SENTENCE 1><CR><LF>  
...  
<NMEA SENTENCE N><CR><LF>  
...
- ▶▶ <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>  
...  
The NMEA data stream format is the same as the one selected by <enable>=2.

 GLL NMEA sentence is not supported.



#### AT\$GPSNMUN?

Read command returns whether the unsolicited GNSS data stream is currently enabled or not, along with the current NMEA mask configuration, in the format:

\$GPSNMUN:<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG >





AT\$GPSNMUN=?

Test command returns the supported range of values for parameters:

<enable>, <GGA>, <GLL>, <GSA>, <GSV>, <RMC>, <VTG>.



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
```



Parameters are stored through \$GPSSAV command.



## AT\$GPSACP - Get Acquired Position

This command returns information about the last GPS position.



[1] NMEA 0183 Standard

SIM Presence	Setting saved	Can be aborted
Not required	No	No



### AT\$GPSACP

Execution command returns information about the last GPS position in the format:

\$GPSACP:

<UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>,<date>,<nsat>

Additional info:

►► Meanings of the parameters returned by the command.

Name	Type	Default	Description
<UTC>	string	-	UTC time (hhmmss.sss) referred to GGA sentence
<latitude>	string	-	latitude in the format ddmm.mmmm S (referred to GGA sentence) where: dd: 00..90, degrees mm.mmmm: 00.0000..59.9999, minutes S: North/South
<longitude>	string	-	longitude in the format dddmm.mmmm W (referred to GGA sentence) where: ddd: 000..180, degrees mm.mmmm: 00.0000..59.9999, minutes



			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	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 RMC sentence)
<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	A	total number of satellites in use (referred to GGA sentence)





Value:

0÷12 : total number of satellites in use



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 the module is down there is no acquired position:

AT\$GPSACP

\$GPSACP: ,,,,0, ,,,,

OK

AT\$GPSP=1

OK

Until first fix is received the command will display this:

AT\$GPSACP

\$GPSACP: ,,,,1, ,,,,

Once fix has been received the command will display actual GPS time and position:

OK

AT\$GPSACP

\$GPSACP: 091635.000,3913.6952N,00904.1505E,0.7,17.9,3,0.0,0.0,0.0,290920,10

OK



## AT\$GNSSACP - Get Acquired Position

This command returns information about the last GNSS position.



- NMEA 0183 Standard

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



### AT\$GNSSACP

Execution command returns information about the last GNSS position in the format:

\$GNSSACP:

<UTC>,<date>,<latitude>,<longitude>,<altitude>,<hdop>,<vdop>,<fix>,<cog>,<spkm>,<spkn>,<mode>,<nsat>

Additional info:

#### ▶▶ Meaning of the parameters returned by the command

Name	Type	Default	Description
<UTC>	string	-	UTC time (hhmmss.sss) referred to GGA 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
<latitude>	string	-	latitude in the format ddmm.mmmm S (referred to GGA sentence) where:



			dd: 00..90, degrees mm.mmmm: 00.0000..59.9999, minutes S: North/South
<longitude>	string	-	longitude in the format dddmm.mmmm W (referred to GGA sentence) where: ddd: 000..180, degrees mm.mmmm: 00.0000..59.9999, minutes W: East/West
<altitude>	string	-	altitude - mean-sea-level (geoid) in meters (referred to GGA sentence)
<hdop>	string	-	Horizontal Dilution of Precision (referred to GGA sentence)
<vdop>	string	-	Vertical Dilution of Precision (referred to GGA sentence)
<fix>	integer	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 RMC sentence)
<spkm>	string	-	speed over ground (km/h) (referred to VTG sentence)



<spkn>	string	-	speed over ground (knots) (referred to VTG sentence)
<mode>	string	-	<p>Mode Indicator: six characters that indicate the operating mode of the six constellations GPS, GLONASS, Galileo, BDS, QZSS, NavIC (Not supported).</p> <p>The characters shall take one of the following values:</p> <p>A = Autonomous.  D = Differential.  E = Estimated (dead reckoning) Mode.  F = Float RTK.  M = Manual Input Mode.  N = No fix.  P = Precise.  R = Real Time Kinematic.  S = Simulator Mode.  (referred to GNGNS sentence)</p>
<nsat>	integer	-	total number of satellites in use (referred to GNS sentence)



AT\$GNSSACP?

Read command has the same behavior as the Execution command.



AT\$GNSSACP=?

Test command returns the OK result code.



AT\$GPSP?

\$GPSP: 0

When the module is down there is no acquired position:

AT\$GNSSACP

\$GNSSACP: ,,,,,,0,,,,

OK



AT\$GPSP=1

OK

Until first fix is received the command will display this:

AT\$GNSSACP

\$GNSSACP: .....,1,....

Once fix has been received the command will display actual GNSS time and position:

OK

AT\$GNSSACP

\$GNSSACP:

132807.000,130521,3913.6929N,00904.1545E,8.2,0.8,0.8,3,0.0,0.0,0.0,AANNNN,14

OK



## AT\$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration

Set command activates specific GNSS NMEA sentences (related to GALILEO, GLONASS, BEIDOU and QZSS constellation) in the GNSS data stream and defines which NMEA extended sentences will be available.

GNSS data stream must be activated with AT\$GPSNMUN command.

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No

```
AT$GPSNMUNEX=[,<GNGNS>[,<GNGSA>[,<GLGSV>[,<GPGRS>[,<GAGSV>[,<GAGSA>
[,<GAVTG>[,<GPQGA>[,<PQGSV>[,<GNVTG>[,<GNRMC>[,<GNGGA>]]]]]]]]]]]
```

Parameters:

Name	Type	Default	Description
<GNGNS>	integer	0	Fix data of GNSS (or GLONASS) receivers.
Values:			
.....			
0		:	disable
1		:	enable
.....			
<GNGSA>	integer	0	DOP and active satellites of GNSS (or GLONASS).
Values:			
.....			
0		:	disable
1		:	enable
.....			
<GLGSV>	integer	0	GLONASS satellites in view
Values:			



		0	:	disable	
		1	:	enable	
<GPGRS>	string	0		GPS Range Residuals	
		Values:			
		0	:	disable	
		1	:	enable	
<GAGSV>	integer	0		Galileo satellites in view	
		Values:			
		0	:	disable	
		1	:	enable	
<GAGSA>	integer	0		Galileo DOP and active satellites	
		Values:			
		0	:	disable	
		1	:	enable	
<GAVTG>	integer	0		Galileo track made good and ground speed	
		Values:			
		0	:	disable	



	1	:	enable	
	.....			
<GPGGA>	integer	0	GPS fix data	
	Values:			
	.....			
	0	:	disable	
	1	:	enable	
	.....			
<PQGSA>	integer	0	Proprietary string for fix data regarding BeiDou and QZSS	
	Values:			
	.....			
	0	:	disable	
	1	:	enable	
	.....			
<PQGSV>	integer	0	Proprietary string for satellites in view regarding BeiDou and QZSS	
	Values:			
	.....			
	0	:	disable	
	1	:	enable	
	.....			
<GNVTG>	integer	0	Track made good and ground speed	
	Values:			
	.....			
	0	:	disable	





	1	:	enable
<GNRMC>	integer 0		Recommended Minimum Specific GNSS Data
Values:			
	0	:	disable
	1	:	enable
<GNGGA>	integer 0		GNSS fix data
Values:			
	0	:	disable
	1	:	enable



NMEA extended data is displayed on NMEA port depending on \$GPSNMUN <enable> parameter setting.



GNGGA and GPGRS NMEA sentences are not supported

#### AT\$GPSNMUNEX?

Read command returns the NMEA extended sentences availability status, in the format:

\$GPSNMUNEX:<GNGNS>,<GNGSA>,<GLGSV>,<GPGRS>,<GAGSV>,<GAGSA>,<GAVTG>,<GPGGA>,<PQGSV>,<GNVTG>,<GNRMC>,<GNGGA>

#### AT\$GPSNMUNEX=?

Test command returns the supported range of values for parameters:



```
<GNGNS>,<GNGSA>,<GLGSV>,<GPGRS>,<GAGSV>,<GAGSA>,<GAVTG>,<GPGGA>,  
<PQGS A>,<PQGSV>,<GNVTG>,<GNRMC>,<GNGGA>
```



```
AT$GPSP=1  
OK
```

```
Enable only the GNRMC sentence  
AT$GPSNMUNEX=0,0,0,0,0,0,0,0,0,0,1,0  
OK
```

```
AT$GPSNMUN=1,0,0,0,0,0,0  
OK
```

```
$GPSNMUN: $GNRMC,133511.00,A,3917.27051,N,00900.13895,E,0.0,,120520,  
0.1,W,A,V*6E  
$GPSNMUN: $GNRMC,133512.00,A,3917.27052,N,00900.13897,E,0.0,,120520,  
0.1,W,A,V*6C  
$GPSNMUN: $GNRMC,133513.00,A,3917.27052,N,00900.13898,E,0.0,,120520,  
0.1,W,A,V*62
```



Parameters are stored through \$GPSSAV command.



## AT\$GNSSNMEA - Unsolicited NMEA Data Configuration

Set command activates an unsolicited GNSS data stream, in the form of 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.



[1] NMEA 0183 Standard

SIM Presence	Setting saved	Can be aborted
Not required	Specific profile	No



AT\$GNSSNMEA=<enable>[,<nmea\_mask>]

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.  See Additional info section to have information on GNSS data stream formats.

Values:

- 0 : disable GNSS data stream
- 1 : enable the GNSS data stream format



2	:	enable the GNSS data stream format and reserve the AT interface port only for the GNSS data stream
<hr/>		
<nmea_mask>	hex	-
The <nmea_mask> value defines which NMEA sentences will be available (see Additional info). The default <nmea_mask> value is 0 (No sentences available). The hexadecimal format of the bit mask does not require the prefix 0x; example : 0, 1F, 3F		

Additional info:

▶▶ Bitmap description of the <nmea\_mask> parameter

<nmea_mask>	Sentences
Bit 0	RMC
Bit 1	GGA
Bit 2	GSA
Bit 3	GSV
Bit 4	GLL
Bit 5	VTG
Bit 6	ZDA
Bit 7	GNS
Bit 8	GRS



Bit 9 - 31

Not Used

►► <enable>=1, GNSS data stream format:

<NMEA SENTENCE 1><CR><LF>

...

<NMEA SENTENCE N><CR><LF>

...

►► <enable>=2, 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>

...

The NMEA data stream format is the same as the one selected by <enable>=1.


**AT\$GNSSNMEA?**

Read command returns whether the unsolicited GNSS data stream is currently enabled or not, along with the current NMEA mask configuration, in the format:

\$GNSSNMEA:<enable>,<nmea\_mask>


**AT\$GNSSNMEA=?**

Test command returns the supported range of values for parameters:

<enable>, (list of supported <nmea\_mask> values).





Set the GSA as available sentence in the unsolicited message

```
AT$GNSSNMEA=1,4
```

```
OK
```

Read the current NMEA mask configuration:

```
AT$GNSSNMEA?
```

```
$GNSSNMEA: 1,4
```

```
OK
```

The unsolicited message will be:

```
$GNSSNMEA:
```

```
$GNGSA,A,3,23,20,24,07,13,04,02,,,,,2.4,1.6,1.8°3C
```

Turn-off the unsolicited mode

```
AT$GNSSNMEA=0
```

```
OK
```



Parameters are stored through \$GPSSAV command.



## AT#GTP - Get Position from GTP WWAN Service

Execute command returns a position based on cellular database from GTP (Global Terrestrial Positioning) WWAN service.

SIM Presence	Setting saved	Can be aborted
Required	No	No



### AT#GTP

Execute command returns immediately OK.

As soon as the coordinates are obtained, the following URC is printed in the AT interface:

#GTP: <latitude>,<longitude>,<altitude>,<accuracy>

If the coordinates are not received within the expected maximum time or there is some problem, the following URC is printed:

#GTP: ERROR

If AT#GTP is immediately executed again and neither the coordinates nor the error message is printed yet on the console, it will return an error. The following URC is printed:

+CME ERROR: operation not allowed

Additional info:

►► Meanings of the parameters returned by the command.

Name	Type	Default	Description
<latitude>	integer	N/A	latitude specified in WGS84 datum
Value:			
90÷90.0 : expressed in degrees, (+/-: North / South)			



<longitude>	integer	N/A	longitude specified in WGS84 datum
-------------	---------	-----	------------------------------------

Value:

180÷180.0 : expressed in degrees, (+/-: East / West)

<altitude>	integer	N/A	altitude with respect to the WGS84 ellipsoid
------------	---------	-----	--

Value:

500÷15883 : expressed in meters

<accuracy>	integer	-	horizontal position uncertainty (circular) expressed in meters
------------	---------	---	---



Define the PDP context via +CGDCONT command before using #GTP command



AT#GTP=?

Test command returns the OK result code.



- AT#GTP  
OK





#GTP: 12.905499, 77.648928,0, 5082.77

- Consider the scenario where a client invokes GTP service to fetch the coordinates. Below is the sequence of commands to be followed

Enable the GTP. Device will reboot

AT#GTPENA=1

OK

AT+CGDCONT=<cid>,<pdp\_type>,<APN>

OK

AT#GTP

OK

#GTP: 12.905499, 77.648928,0, 5082.77



## AT#GTPEN - Enable the GTP WWAN Service

This command enables the Global Terrestrial Positioning feature and reboots the device.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#GTPEN=<enable>

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enables/disables GTP
Values:			
.....			
0	:	disable	
1	:	enable	
.....			



The command performs the module reboot.



AT#GTPEN?

Read command returns current value of the parameter <enable>



AT#GTPEN=?

Test command returns range for the parameter <enable>





This AT command causes a reboot



Enable  
AT#GTPEN=1  
OK

Disable  
AT#GTPEN=0  
OK

Read  
AT#GTPEN?  
#GTPEN: 0  
OK

Test  
AT#GTPEN=?  
#GTPEN: (0-1)  
OK



## AT#GTPENA - Enable the GTP WWAN Service

This command enables/disables GTP (Global Terrestrial Positioning) feature.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#GTPENA=<enable>

Parameter:

Name	Type	Default	Description
<enable>	integer	0	enables/disables GTP
Values:			
.....			
0	:	disable	
1	:	enable	
.....			



The command performs the module reboot.



AT#GTPENA=?

Test command returns the OK result code.



This AT command causes a reboot





```
Enable
AT#GTPENA=1
OK
```

```
Disable
AT#GTPENA=0
OK
```

```
Test
AT#GTPENA=?
#GTPENA: (0-1)
OK
```



## AT#GTPCFG - Configure the GTP Parameters

This command sets the type of Global Terrestrial Positioning (GTP) WWAN service requested with the AT#GTP command.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#GTPCFG=<power>,<accuracy>

Parameters:

Name	Type	Default	Description
<power>	integer	1	Select the requested power level. The list of available values is obtained with the test command
Value:			
<div> <div>1</div> <div>:</div> <div>Low</div> </div>			
<accuracy>	integer	1	Accuracy requested for the GTP command
Values:			
<div> <div>1</div> <div>:</div> <div>Low</div> </div>			
<div> <div>2</div> <div>:</div> <div>Medium</div> </div>			
<div> <div>3</div> <div>:</div> <div>High</div> </div>			





<power> Low and <accuracy> Low (default configuration) will trigger GTP1.0 service.

<power> Low and <accuracy> Medium or High will trigger GTP2.0 service.



AT#GTPCFG?

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

#GTP:<power>,<accuracy>



AT#GTPCFG=?

Test command returns range for the parameters <power> and <accuracy>



Enable

AT#GTPEN=1

OK

Read

AT#GTPCFG?

#GTP:1,1

OK

Set

AT#GTPCFG=1,2

OK

AT#GTP

OK

#GTP: 12.926971, 77.632763, 809.00, 513.32



## Assisted GNSS





## AT\$AGNSS - Set AGNSS Enable

This command set the AGNSS providers enable or disable. It needs a reboot to make effective the setting.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT\$AGNSS=<provider>,<status>

Parameters:

Name	Type	Default	Description
<provider>	integer	N/A	selects the AGNSS provider to be set
Value:			
<div> <div>0</div> <div>:</div> <div>use XTRA AGNSS provider</div> </div>			
<status>	integer	N/A	set the AGNSS provider enable status
Values:			
<div> <div>0</div> <div>:</div> <div>set selected AGNSS provider disabled</div> </div>			
<div> <div>1</div> <div>:</div> <div>set selected AGNSS provider enabled</div> </div>			



AT\$AGNSS?

Read command returns the requested and the active status for each AGNSS provider.

\$GPSAGNSS: <provider>,<active>,<requested>



Additional info:

►► Here are the meanings of <active> and <requested> parameters.

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



AT\$AGNSS=?

Test command returns supported values range of < provider >, <status >.



Get the active value and requested value

AT\$AGNSS?

\$AGNSS: 0,0,0

OK

Set AGNSS enable status

AT\$AGNSS=0,1

OK

Until a reboot is done active value remain and requested value change

AT\$AGNSS?

\$AGNSS: 0,0,1

OK

It needs a reboot to make effective the setting

AT#REBOOT

OK



Active value is now the requested value  
AT\$AGNSS?  
\$AGNSS: 0,1,1  
OK



## AT\$AGNSSCFG - AGNSS Configuration

This command handles Assisted GNSS configuration. Some settings may require a reboot for the change to take effect.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT\$AGNSSCFG=<provider>,<parameter>,<value>

Parameters:

Name	Type	Default	Description
<provider>	integer	N/A	select the AGNSS provider to be set
Value:			
.....			
0 : use XTRA AGNSS provider			
.....			
<parameter>	integer	N/A	set the parameter to configure
Values:			
.....			
0 : XTRA duration hours			
1 : Enable or disable URCs for XTRA download			
.....			
<value>	integer	-	value depends on the previous <parameter>. See Additional info section

Additional info:



- <parameter>=0: in this case, <value> handles the configuration of XTRA duration hours

Name	Type	Default	Description
<duration>	integer	1	select the time validity of XTRA data. It is effective only after a module reboot
<div>Values:</div> <div><div>0</div><div>:</div><div>24 hours (one day)</div></div> <div><div>1</div><div>:</div><div>72 hours (three days)</div></div> <div><div>2</div><div>:</div><div>168 hours (one week)</div></div>			

- <parameter>=1, in this case <value> permits to configure URCs for XTRA download

Name	Type	Default	Description
<URCs>	integer	0	enable or disable URCs for XTRA download. The effect of the command is immediate.
<div>Values:</div> <div><div>0</div><div>:</div><div>Disable</div></div> <div><div>1</div><div>:</div><div>Enable</div></div>			





### AT\$AGNSSCFG?

Read command returns configurations for AGNSSCFG.

Two rows will be printed.

The first row has <parameter>=0. It has the following form:

\$AGNSSCFG: <provider>,<parameter>,<active>,<requested>

In the second row, with <parameter>=1, <requested> has no meaning (because the configuration is applied instantly), so it is not printed:

\$AGNSSCFG: <provider>,<parameter>,<active>

Additional info:

►► Below the meanings of <active> and <requested> parameters.

Name	Type	Default	Description
<active>	integer	-	value showing the active status currently used by the system.
<requested>	integer	-	value showing the requested status that will be activated on the next power ON.



### AT\$AGNSSCFG=?

Test command returns the supported value range for <provider>,<parameter>,<value>.



Get active and requested values for XTRA duration, and the availability for XTRA download status URCs:

AT\$AGNSSCFG?

\$AGNSSCFG: 0,0,1,1



```
$AGNSSCFG: 0,1,0
```

```
OK
```

In the above example, active and requested XTRA duration values are set to 72 hours, and URCs are not enabled.

Set XTRA duration hours = 168 hours

```
AT$AGNSSCFG=0,0,2
```

```
OK
```

Until a reboot is done, the active value remains the same but the requested value changes:

```
AT$AGNSSCFG?
```

```
$AGNSSCFG: 0,0,1,2
```

```
$AGNSSCFG: 0,1,0
```

```
OK
```

A reboot is needed for the change to take effect (requested value will become the active value)

```
AT#REBOOT
```

```
OK
```

Active value is now the previously requested value

```
AT$AGNSSCFG?
```

```
$AGNSSCFG: 0,0,2,2
```

```
$AGNSSCFG: 0,1,0
```

```
OK
```

Conversely, the effect of applying URCs availability is immediate

```
AT$AGNSSCFG=0,1,1
```

```
OK
```

The above command enables URCs, and a reboot is not required for the change to take effect

```
AT$AGNSSCFG?
```

```
$AGNSSCFG: 0,0,2,2
```

```
$AGNSSCFG: 0,1,1
```



OK





## AT\$AGNSSFINJ - AGNSS File Injection

This command handles Assisted GNSS file injection. XTRA file should be downloaded in the host and sent to MDM through AT#M2MWRITE. Also, XTRA must be enabled before the injection.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT\$AGNSSFINJ=<provider>

Parameter:

Name	Type	Default	Description
<provider>	integer	N/A	select the AGNSS provider to be set
Value:			
<div> <div>0</div> <div>:</div> <div>use XTRA AGNSS provider</div> </div>			



AT\$AGNSSFINJ=?

Test command returns the supported value range for <provider>



Send XTRA file to MDM card. It is required to use the destination path GNSS/xtra.bin:

AT#M2MWRITE="/GNSS/xtra.bin",22748

>>> here receives the prompt; then send the file, sized (in this example) 22748 bytes

OK

XTRA must be enabled and the system must be rebooted for the change to take effect:

AT\$AGNSS=0,1



OK  
AT#REBOOT  
OK

After the module is rebooted, XTRA can be injected into the GNSS engine:

AT\$AGNSSFINJ=0  
OK

Eventually, NMEA session using XTRA data can be launched:

AT\$GNSSNMEA=1,FF  
OK  
AT\$GPSP=1  
OK



## AT\$AGNSSFDL - AGNSS File Download

This command handles Assisted GNSS file download. Currently, only FTP protocol is supported. After the download, the file can be injected using AT\$AGNSSFINJ, so AT#M2MWRITE step could be skipped

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT\$AGNSSFDL=<url>

Parameters:

Name	Type	Description
<url>	string	Insert the FTP url that points to the XTRA file. Port is not mandatory, if not present, the default value is 21.



AT\$AGNSSFDL=?

Test command returns OK



Perform SGACT command:

AT#SGACT=1,1

#SGACT: 2.194.96.78

Download the XTRA file (it will be placed in the local destination GNSS/xtra.bin):

AT\$AGNSSFDL=ftp://ftpuser:ftppassword@hostname:21/path/to/xtra3gr.bin

OK

>>> wait for the confirmation message that the download is completed

FTP download successful



XTRA must be enabled, priority should be changed to GNSS and the system must be rebooted for the changes to take effect:

```
AT$AGNSS=0,1
```

```
OK
```

```
AT$GPSCFG=0,0
```

```
OK
```

```
AT#REBOOT
```

```
OK
```

After the card is rebooted, XTRA can be injected into the GNSS engine:

```
AT$AGNSSFINJ=0
```

```
OK
```

Eventually, NMEA session using XTRA data can be launched:

```
AT$GNSSNMEA=1,FF
```

```
OK
```

```
AT$GPSP=1
```

```
OK
```



## Mobile Broadband



---

## Ethernet Control Mode (ECM)



## AT#ECM - Ethernet Control Model Setup

This command sets up an Ethernet Control Model (ECM) session.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#ECM=<Cid>,<Did>

Parameters:

Name	Type	Default	Description
<Cid>	integer	-	context id that will be used by ECM. Refer to test command to know the supported range of values.
<Did>	integer	-	device id, currently limited to 0 (only one device)



To enable the ECM session configuration the module must be rebooted.



To activate an ECM session a compatible USB configuration has to be set; for details refer to the description of #USBCFG.



AT#ECM?

Read command returns the session state in the following format:

# ECM: <Did>,<State>

OK

Additional info:



Here are the parameters meaning returned by the read command and not described in the previous sections.



Name	Type	Default	Description
<State>	integer	0	ECM session status.
Values:			
.....			
0 : disabled			
1 : enabled			
.....			



AT#ECM=?

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





## AT#ECMCFG - ECM Configuration

This command is used to configure additional parameters for ECM.

SIM Presence	Setting saved	Can be aborted
Not required	Auto	No



AT#ECMCFG=<roaming>[,<nat\_timeout>]

Parameters:

Name	Type	Default	Description
<roaming>	integer	1	Roaming allowed during ECM
Values: <div> <div>0 : Disabled</div> <div>1 : Enabled</div> </div>			
<nat_timeout>	integer	300	NAT table entries expiration timeout
Value: <div> <div>300÷3600 : timeout (sec)</div> </div>			



The configuration will be applied after a reboot.



 This feature involves only the ECM behavior.

 <nat\_timeout> has meaning only if ECM is configured to use the private IP (see #IPPASSTH for details).



AT#ECMCFG?

Read command reports the current configuration in the format:

#ECMCFG: <roaming>,<nat\_timeout>



AT#ECMCFG=?

Test command returns the supported values of the parameters.



## AT#ECMD - ECM Shutdown

This command is used to shutdown an Ethernet Control Model (ECM) session.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#ECMD=<Did>

Parameter:

Name	Type	Default	Description
<Did>	integer	N/A	Device id, currently limited to 0 (only one device)
Value:			
<div> <div>0</div> <div>:</div> <div>Device id (currently limited to only one device)</div> </div>			



To make active the command the module must be rebooted.



AT#ECMD?

Read command returns the session state in the following format:

#ECM: <Did>,<State>

OK

Additional info:



Parameter returned by the read command and not described in the previous sections.



Name	Type	Default	Description
<State>	integer	0	State of Ethernet Control Model (ECM) session
Values:			
.....			
0	:	disabled	
1	:	enable	
.....			



AT#ECMD=?

Test command returns the range of supported values for <Did>.



## AT#IPPASSTH - ECM IP pass through

This command is used to enable/disable the IP pass through functionality for ECM.

Usually, to use the ECM a small private local network is created between the module and the PC (IP private mode); enabling the IP pass through the user can configure the ECM interface to use the IP address assigned to the module by the network operator avoiding the creation of the local private network (IP Public mode).

When the IP Public mode is used, the firmware needs to reserve at least 20 TCP ports for internal services; these ports cannot be used by the host. The reserved ports range can be set using the optional parameters of the AT command

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#IPPASSTH=<enabled>[,<res\_port>[,<res\_range>]]

Set command enables/disables the IP pass through functionality.

Parameters:





Name	Type	Default	Description
<enabled>	integer	0	enable/disable the IP pass through functionality
Values: <div> <div>0 : Disabled, ECM works as usual</div> <div>1 : Enabled</div> </div>			
<res_port>	integer	60000	the first reserved port
Value: <div> <div>5000÷65515 : TCP port</div> </div>			



<res_range>	integer	20	the number of reserved ports starting from <res_port>
-------------	---------	----	---

Value:

20÷100	:	Number of reserved ports
--------	---	--------------------------

-  The configuration will be applied after a reboot.
-  This feature involves only the ECM behavior.
-  Enabling this feature could require configuring manually the network interface on the host.
-  <res\_port> + <res\_range> cannot be greater than 65535.



AT#IPPASSTH?

Read command presents the current configuration in the format:

IPPASSTH: &lt;status&gt;,&lt;res\_port&gt;,&lt;res\_range&gt;



AT#IPPASSTH=?

Test command returns the supported values of the parameters.



## Non-IP Data Delivery (NIDD)



## AT#NIPDCFG - Define NIDD Parameters

This set command allows the TE to specify the parameters for a NIDD connection. It is supported by modules with NBIoT technology.

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT#NIPDCFG=<type>,<cid>[,<userName>[,<passWord>[,<ringDuration>[,<unused1>]]]]


Parameters:

Name	Type	Default	Description
<type>	integer	0	Non-IP outgoing data type
Values: <div> <div>0 : MO Non-IP data type</div> <div>1 : MO Exception Non-IP data type</div> </div>			
<cid>	integer	-	specifies a PDP context definition, see +CGDCONT command
<userName>	string	-	user name for NIDD connection
<passWord>	string	-	password for NIDD connection
<ringDuration>	integer	0	disable, enable/set duration of the generated pulse
Value:			






<div>0 : disable RI pin response for URC message (#NIPDSRING)</div> <div>50 ÷ : enable RI pin response for URC message (#NIPDSRING) with a duration specified in ms</div> <div>1150</div>			
<unused1>	integer	0	unused parameter
<div>Value:</div> <div>0 : dummy value</div>			



AT#NIPDCFG?

Read command returns the NIDD parameters, excluding <password>, for every defined PDP context, in the format:

#NIPDCFG: <type>,<cid>,<userName>,<ringDuration>,0



AT#NIPDCFG=?

Test command reports the supported range of values for parameters <type>, <cid>, <ringDuration> and <unused1> and the maximum length for parameters <userName> and <passWord>.



## AT#NIPDCONN - Open and Close a NIDD Connection

This command allows the TE to open and close a NIDD connection. It is supported by modules with NBIoT technology.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#NIPDCONN=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	open/close the NIDD connection
Values:			
.....			
0	:	close the NIDD connection	
1	:	open the NIDD connection	
.....			



AT#NIPDCONN?

Read command reports the status of the NIDD connection, in the format:

#NIPDCONN: <status>

<status> has the same meaning and values of <mode> parameter.



AT#NIPDCONN=?

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



## AT#NIPDSEND - Send MO Non-IP Data

This command allows the TE to send MO Non-IP data. It is supported by modules with NBIoT technology.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#NIPDSEND=<mode>,<data>[,<rai>]

Parameters:

Name	Type	Default	Description
<mode>	integer	0	data format
Values: <div> <div>0 : ASCII format string</div> <div>1 : HEX format string</div> </div>			
<data>	string	-	data to be sent
<rai>	integer	0	RAI (release assistance indication) setting
Values: <div> <div>0 : No info available</div> <div>1 : No further uplink or downlink data transmission subsequent to this transmission</div> </div>			



2 : Only a single downlink data transmission and no further uplink data transmissions subsequent to this transmission



#### AT#NIPDSEND?

Test command reports the supported range of values for parameter <mode>, the maximum length of the string for parameter <data> and the supported range of values for parameter <rai>



## AT#NIPDRECV - Retrieve Non-IP Data

This command allows the TE to retrieve the received MT Non-IP data. It is supported by modules with NBloT technology.

When MT Non-IP data are received, an unsolicited message is reported in the format:

#NIPDSRING: <recvdLen>

To get the data use #NIPDRECV command.

SIM Presence	Setting saved	Can be aborted
Required	No	No



AT#NIPDRECV=<readLen>[,<mode>]

Parameters:

Name	Type	Default	Description
<readLen>	integer	-	data length to be retrieved, see test command to get the available data length range.  If <readLen>=0 the information about received data are queried, see Additional info section.
<mode>	integer	0	data format
Values:			
.....			
0	:	ASCII format string	
1	:	HEX format string	
.....			

Additional info:

►► <read\_len>=0

The response reports the length of received data, read data and unread data, in the format:

#NIPDRECV: <totalRecvdLen>,<totalReadLen>,<unreadLen>



Name	Type	Default	Description
<totalRecvdLen>	integer	-	total length of received data
<totalReadLen>	integer	-	length of read data
<unreadLen>	integer	-	length of unread data

Unsolicited field:

Name	Type	Description
<recvdLen>	integer	length of received data



AT#NIPDRECV=?

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



# IMS



# AT+CIREG - IMS registration state

The command controls the presentation of an unsolicited result code when there is a change in the MT's IMS registration information.



3GPP TS 24.229  
3GPP TS 24.173  
3GPP TS 24.341

SIM Presence	Setting saved	Can be aborted
Not required	No	No



AT+CIREG=<mode>  
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:			
<div>0 : disable reporting</div> <div>1 : enable reporting (parameter &lt;reg_info&gt;).</div> <div>2 : enable extended reporting (parameters &lt;reg_info&gt; and &lt;ext_info&gt;).</div>			


Unsolicited fields:

Name	Type	Description
------	------	-------------






<div>&lt;reg_info&gt;</div> <div>integer</div>	<div>Indicates the IMS registration status. The UE is seen as registered if one or more of its public user identities are registered with any of its contact addresses.</div> <div>Values:</div> <div><div>0</div><div>:</div><div>not registered.</div></div> <div><div>1</div><div>:</div><div>registered.</div></div>
<div>&lt;ext_info&gt;</div> <div>integer</div>	<div>the value could be either 1 or 5. It is a sum of values, each representing an IMS capability of the MT. This parameter is not present if the IMS registration status is "not registered".</div> <div>Values:</div> <div><div>1</div><div>:</div><div>RTP-based transfer of voice according to MMTEL.</div></div> <div><div>4</div><div>:</div><div>SMS using IMS functionality.</div></div>



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>.



## PSM (Power Saving Mode)



## AT+CPSMS - Power Saving Mode Setting

This command enables/disables Power Saving Mode (PSM) mode.



[1] 3GPP TS 27 007  
[2] 3GPP TS 24.008

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT+CPSMS=[<mode>[,<ReqPeriodicRAU>[,<ReqGPRSreadyTimer>[,<ReqPeriodicTAU>[,<ReqActiveTime>]]]]]

The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disables or enables the use of PSM in the UE.
Values:			
<div>0 : Disable</div> <div>1 : Enable</div>			
<ReqPeriodicRAU>	string	-	one byte in an 8 bit format. Requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN. The requested extended



			periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer3 IE in 3GPP TS 24.008
<ReqGPRSreadyTimer>	string	-	one byte in an 8 bit format. Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN. The requested GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008.
<ReqPeriodicTAU>	string	-	one byte in an 8 bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008.
<ReqActiveTime>	string	-	one byte in an 8 bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008.





A special form of the command can be given as AT+CPSMS= (with all parameters omitted). In this form, the parameter <mode> will be set to 0, the use of PSM will be disabled and data for all parameters in command +CPSMS will be removed or, if available, set to the manufacturer specific default values.



CPSMS configuration is saved in the file system



AT+CPSMS?

Read command returns the current CPSMS configuration, in the format:

+CPSMS:

<mode>,[<ReqPeriodicRAU>],[<ReqGPRSreadyTimer>],[<ReqPeriodicTAU>],  
[<ReqActiveTime>]



AT+CPSMS=?

Test command reports the range for the parameters in the format:

+CPSMS:

(list of supported <mode>s),(list of supported <ReqPeriodicRAU>s), (list of supported  
<ReqGPRSreadyTimer>s),(list of supported <ReqPeriodicTAU>s), (list of supported  
<ReqActiveTime>s)



How to manage timer values octet.

T3412ext value:

Bits 5 to 1 represent the binary coded timer value.

Bits 6 to 8 defines the timer value unit as follows:

Bits

8 7 6

0 0 0 value is incremented in multiples of 10 minutes

0 0 1 value is incremented in multiples of 1 hour

0 1 0 value is incremented in multiples of 10 hours

0 1 1 value is incremented in multiples of 2 seconds

1 0 0 value is incremented in multiples of 30 seconds

1 0 1 value is incremented in multiples of 1 minute



1 1 0 value is incremented in multiples of 320 hours

1 1 1 value indicates that the timer is deactivated.

Example: 10101100 -> 101 means values is incremented in multiples of 1

minute, 01100 means 12 -> the obtained value is 12 minutes

T3324 value:

Bits 5 to 1 represent the binary coded timer value.

Bits 6 to 8 defines the timer value unit for the GPRS timer as follows:

Bits

8 7 6

0 0 0 value is incremented in multiples of 2 seconds

0 0 1 value is incremented in multiples of 1 minute

0 1 0 value is incremented in multiples of decihours

1 1 1 value indicates that the timer is deactivated.



```
AT+CPSMS=1,,,"10101100","00100010"
```

```
OK
```

```
AT+CPSMS?
```

```
+CPSMS: 1,,,"10101100","00100010"
```

```
OK
```

It means that module requires to adopt the PSM for reducing its power consumption. If the network supports PSM and accepts that the UE uses PSM with requested timers value, module enters in PSM when the active timer expires (T3324=2 minutes) and stay in this mode for ten minutes (T3412=12 minutes).

```
AT+CPSMS=0
```

```
OK
```

It means that PSM is set to disable, the module does not go to Power Saving Mode in any case.



## AT#CPSMS - Power Saving Mode Setting

This command enables/disables Power Saving Mode (PSM) mode.

SIM Presence	Setting saved	Can be aborted
Required	Auto	No



AT#CPSMS=[<mode>[,<ReqPeriodicRAU>[,<ReqGPRSreadyTimer>[,<ReqPeriodicTAU>[,<ReqActiveTime>[,<psmVersion>[,<psmThreshold>]]]]]]]

The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value.

This command, unlike the +CPSMS command, accepts the parameters in integer format.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disables or enables the use of PSM in the UE.
<div>Values:</div> <div><div>.....</div><div>0 : disable</div><div>1 : enable</div><div>.....</div></div>			
<ReqPeriodicRAU>	integer	-	requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN. Parameter expressed in sec.
<ReqGPRSreadyTimer>	integer	-	requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN. Parameter expressed in sec.



<ReqPeriodicTAU>	integer	-	requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. Parameter expressed in sec.
<ReqActiveTime>	integer	-	requested Active Time value (T3324) to be allocated to the UE. Parameter expressed in sec.
<psmVersion>	integer	4	bitmask to indicate PSM modes. Each bit is configured independently. Default value: <psmVersion>=4
<p>Values:</p> <p>.....</p> <p>1 : (bit 0) PSM without network coordination</p> <p>2 : (bit 1) Rel 12 PSM without context retention</p> <p>4 : (bit 2) Rel 12 PSM with context retention</p> <p>8 : (bit 3) PSM in between eDRX cycles</p> <p>.....</p>			
<psmThreshold>	integer	60	Minimum duration threshold (in sec) to enter PSM. Minimum value is 60 seconds.
<p>Value:</p> <p>.....</p> <p>60 : Minimum value of duration threshold</p> <p>.....</p>			



A special form of the command can be given as AT#CPSMS= (with all parameters omitted). In this form, the parameter <mode> will be set to 0, the use of PSM will





be disabled and data for all parameters in command #CPSMS will be removed or, if available, set to the manufacturer specific default values.



CPSMS configuration is saved in the file system.



## AT#CPSMS?

Read command presents the current CPSMS configuration returned by the network, in the format:

#CPSMS: <status>,[<T3324>],[<T3412 or T3412EXT>],<psmVersion>,<psmThreshold>,<mode>

Additional info:



Meaning of the returned parameters.

Name	Type	Default	Description
<status>	integer	0	PSM status in the network (response from the network)
Values: <div> <div>0 : PSM active</div> <div>1 : PSM not active</div> </div>			
<T3324>	integer	-	T3324 timer value in the network, in seconds (could be different from the requested one)
<T3412/ T3412EXT>	integer	-	T3412 or T3412Ext timer value in the network, in seconds (could be different from the requested one).





AT#CPSMS=?

Test command returns OK result code.



## AT#PSMURC - Power Saving Mode URC

Set command enables/disables the URC that informs when modem entering in power saving mode.

SIM Presence	Setting saved	Can be aborted
Required	Common profile	No



AT#PSMURC=<en>

The URC format is:

#PSMURC=<ActiveTime>,<PSMTime>

Parameter:

Name	Type	Default	Description
<en>	integer	0	enable/disable URC message
Values:			
0	:	disable URC message	
1	:	enable URC message	

Unsolicited fields:

Name	Type	Description
<ActiveTime>	integer	requested Active Time value, in seconds (T3324)
<PSMTime>	integer	low power phase duration in seconds (difference between T3412 and T3324 including boot time).



AT#PSMURC?

Read command reports the status (enable/disable):

#PSMURC: <en>



AT#PSMURC=?



Test command reports the supported range of value for parameter:  
#PSMURC: (0,1)



The setting is saved using the &W command.



## Debugging



## 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
Not required	No	No



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, <configurationString> 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	<p>trace class name available to the user to select the trace output.</p> <p>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.</p>
<p>Values:</p> <hr/>			
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
httpc	:	TC_HTTPC
ati	:	TC_ATI
backup	:	TC_BACKUP
nipd	:	TC_NIPD
sys	:	TC_SYS
psm	:	TC_PSM
ssl	:	TC_SSL
tm	:	TC_TM
ico	:	TC_ICO





	<div>csurv : TC_CSURV</div> <div></div>
	<div>&lt;umode&gt; integer N/A enable/disable the trace output selected</div>
	<div>Values:</div> <div></div> <div>0 : disable</div> <div>1 : enable</div> <div></div>
	<div>AT#TRACE?</div> <div>Read command reports the currently selected parameter values in the format:</div> <div>#TRACE: "&lt;unit&gt;=&lt;umode&gt;,...,&lt;unit&gt;=&lt;umode&gt;"</div>
	<div>AT#TRACE=?</div> <div>Test command returns OK.</div>

	<div>Here are some examples:</div> <div></div> <div> <ul style="list-style-type: none"> <li>Set all trace outputs OFF AT#TRACE=0 OK</li> <li>Set all trace outputs ON AT#TRACE=1 OK</li> </ul> </div>
---	---



- Enable/disable trace outputs selected  
AT#TRACE=,"generic=1,clock=0,lwm2m=1,pdp=0,gnss=0,ati=0"  
OK



# Acronyms and Abbreviations

Table 8: Acronyms and Abbreviations



Acronym	Definition
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
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
VDOP	Vertical dilution of precision
VTG	Course over ground and ground speed
WAAS	Wide Area Augmentation System



## Related Documents

Refer to

<https://dz.telit.com/>

for current documentation and downloads.



## Document History

Table 9: Document History

Revision	Date	Changes
15	2024-05-28	Modified Front Cover Updated Commands: AT#SETHXSTR, AT+CGDCONT, AT+COPS New Commands: AT#PINCFG, AT#UPLMNSEL
14	2024-04-18	New document template Updated Applicability Table Added clause: ME Error Result Code for MQTT - +CME ERROR: <err> Updated Commands: AT#ATUNERSEL, AT#BND, AT#CPSMS, AT#CSURV, AT#ENCALG, AT#FW SWITCH, AT#HTTPCFG, AT#HWREV, AT#M2MBACKUP, AT#M2MRUN, AT#MQCFG, AT#MQCFG2, AT#MQPUBSEXT, AT#MQSNCFG2, AT#MQSNEN, AT#MQSNREG, AT#MQSNSTATE, AT#MQSUB, AT#RPMCFCG, AT#RPMCFCGEXT, AT#SCFGEXT, AT#SERVINFORM, AT#SIMSELGPIOCFG, AT#SLUDP, AT#SSLCFG, AT#SSLS, AT#SSLSECCFG, AT#SSLSECCFG2, AT#SSLSECCDATA, AT#TEMPCFG, AT#TEMPMON, AT#TESTMODE, AT#TRACE, AT#USBCFG, AT#WS46, AT\$GNSSNMEA, AT\$GPSNMUN, AT\$GPSNMUNEX, AT\$GPSSAV, AT+CMUX, AT+M2M New Commands: AT#BOTMR, AT#CCIOTOPTTEXT, AT#ECMCFG, AT#GTPCFG, AT#LWM2MSKIP, AT#M2MKEY, AT#M2MSAPP, AT#NWMTUSIZE, AT#RPMINFO, AT#RPMT1EXT, AT#SSLSECCS, AT#TCPMAXWIN
13	2023-05-18	Updated Applicability Table Added clause 2.2.6 Module Reboot Updated Commands: AT#ATUNERSEL, AT#CCIOTOPT, AT#CSURV, AT#CSURVC, AT#DTR, AT#ECM, AT#ECMD, AT#ENHRST, AT#FWAUTOSIM, AT#FW SWITCH, AT#GAUTH, AT#GPIO, AT#GTPEN, AT#GTPENA, AT#NIPDCFG, AT#NIPDSEND, AT#QSS, AT#PING, AT#REBOOT, AT#RFSTS, AT#RPMCFCG, AT#SCFGEXT2, AT#SETHXSTR, AT#SGACTCFGEXT, AT#SIMDET, AT#SIMINCFG, AT#SMSRETRY, AT#SSLEN, AT#SSLSECCFG, AT#TESTMODE, AT#VSIMSETPROF, AT#WS46, AT+CESQ, AT+CFUN, AT+M2M New Commands: AT#CFLO, AT#CMAR, AT#DRCFG, AT#EPLMNCLEAR, AT#GDATAVOL, AT#HTTPTCVOTA, AT#IPPASSTH, AT#SMSSECENA, AT\$AGNSSFDL
12	2022-06-06	Updated Applicability Table





		<p>Updated Commands: AT#BND, AT#CCIOTOPT, AT#CCLK, AT#CPSMS, AT#CSURV, AT#DVI, AT#GPIO, AT#GTP, AT#HOSTODIS, AT#HTTPQRY, AT#MQCONN, AT#MQPUBS, AT#NTPCFG, AT#OTAUPW, AT#RFSTS, AT#SCFG, AT#SL, AT#SS, AT#SSLCFG, AT#SSLD, AT#SSLEN, AT#SSLH, AT#SSLI, AT#SSLO, AT#SSLRECV, AT#SSLS, AT#SSLSECCFG, AT#SSLSECCFG2, AT#SSLSEND, AT#SSLSENDEXT, AT#SYSHALT, AT#TESTMODE, AT\$AGNSS, AT\$GPSR, AT&amp;K, AT+CCLK, AT+CFUN, AT+CSMP, AT+VTS</p> <p>New Commands: AT#BNDOPTIONS, AT#DNS, AT#DVIEXT, AT#HIGHTP, AT#HWREV, AT#MQPUBSEXT, AT#OTAUP, AT#PLMNSI, AT#PSEL, AT#RPMCFG, AT#RPMCFGEXT, AT#RPMPLMLIST, AT\$AGNSSFINJ</p>
11	2021-09-23	<p>Updated Applicability Table</p> <p>Updated Commands: AT#CPSMS, AT#MONI, AT#MQCFG, AT#MQCFG2, AT#MQCONN, AT#MQDISC, AT#MQEN, AT#MQPUBS, AT#MQREAD, AT#MQSUB, AT#MQTCFG, AT#MQUNS, AT#MQWCFG, AT#NTP, AT#TESTMODE, AT\$GPSCFG, AT+CCID, AT+IFC</p> <p>New Commands: AT#ATUNERSEL, AT#BNDTUNER, AT#GTPEN, AT#MQSNCFG, AT#MQSNCFG2, AT#MQSNCONN, AT#MQSNDISC, AT#MQSNEN, AT#MQSNPUBS, AT#MQSNREAD, AT#MQSNREG, AT#MQSNSOCK, AT#MQSNSTATE, AT#MQSNSUB, AT#MQSNTCFG, AT#MQSNUNS, AT#MQSNWCFG, AT#MQSNWMUP, AT#MQSNWTUP, AT#NIPDCFG, AT#NIPDCONN, AT#NIPDRECV, AT#NIPDSEND, AT#SETHEXSTR, AT\$GNSSACP</p>
10	2021-08-04	<p>Updated Applicability Table</p> <p>Updated Commands: AT+CGSN, AT#CGSN, AT#SWPKG, AT#FW SWITCH, AT&amp;K, AT+COPS, AT+CCWA, AT#BND, AT#WS46, AT#IRATTIMER, AT#NB2ENA, AT#JDRENH2, AT#JDR4GCFG, AT+CGEREP, AT#SIMDET, AT#SIMINCFG, AT+CLV, AT#GPIO, AT#SLED, AT#SGACT, AT#SSLSECCFG2, AT+ODIS, AT#M2MRUN, AT#MQCFG, AT#MQCONN, AT\$GPSCFG, AT\$GPSDPO, AT#GTP</p> <p>New Commands: AT+CEMODE, AT#SMSRETRY, AT#VSIMSETPROF, AT#VSIMSTAT, AT#VSIMVER, AT#DTMF, AT#ECAM</p> <p>AT\$AGNSSCFG</p>
9	2021-02-17	Updated Commands: #SIMINCFG, #SWPKG
8	2021-02-04	<p>New document template</p> <p>Updated Commands: #AUTOATT, #CEDRXS, #CPSMS, #CSURV, #DGEN, #FW SWITCH, #GTP, #GTPENA, #HTTPQRY, #IRATTIMER, #MQCFG, #MQCFG2, #MQCONN, #MQDISC, #MQEN, #MQPUBS, #MQREAD, #MQSUB, #MQTCFG, #MQUNS, #MQWCFG, #NTP, #SCFGEXT3, #SLASTCLOSURE, #SEND, #SENDEXT, #SENDUDP, #SENDUDPEXT, #SSLCFG, #SSLSECCFG2,</p>



		<p>#SSLSECDATA, #TESTMODE, \$GPSCFG, +CCLK, +CGDCONT, +M2M</p> <p>New Commands: #ACDB, #ATDCECHECK, #BSRCFG, #CODECINFO, #CPSMSCFG, #DTR, #FIRSTNET, #FPLMN, #FTPCMD, #FTPGETF, #LWM2MSKIP, #M2MREADEXT, #SIMSELGPIOCFG, #SSLSECCA, #TEMPCFG, #TEMPMON, \$GNSSNMEA, \$GPSDPO, +CRSL</p>
7	2020-11-05	<p>Updated Commands: +CLIR, +CPWD, #CEDRXS, #IOTBND, #LTESFN, #SSLCFG, #SSLSECCFG2, #SSLSECDATA, #CSURVF, \$GPSCFG, \$GPSNMUNEX</p> <p>New Commands: \$GPSR, #NB2ENA, #BNDPRIEXT</p>
6	2020-09-23	<p>Updated Commands: +CMUX, #PORTCFG, #WS46, #IOTBND, #JDR4GCFG, #SIMDET, #SIMPR, #SIMINCFG, #STIA, #DGEN, #GPIO, #TESTMODE, #HTTPCFG, #HTTPSND, #SSLCFG, #SSLSECCFG2, #SSLSECCFG, #MQPUBS, \$GPSNMUN, \$GPSNMUNEX, ATD, #SSLSECDATA</p> <p>New Commands: ATA, +CHUP, #DIALMODE, +VTS, +VTD, +CLIP, +CLIR, +CCWA, +CLCC, #LTESFN, +CMUT, #OAP, #DVI, #CSURVC, #M2MARG, \$GPSSAV, \$GPSRST, \$GPSACP, #GTP, #GTPENA, #BCCHLOCK, +CRCES, #SNRSET, #IRATTIMER, #FWAUTOSIM, #FOTAURC, \$AGNSS, #PSMURC, +CIREG, #TRACE, #HWVER</p>
5	2020-06-01	<p>Updated Commands: #USBCFG, #FWSWITCH, +IPR, #STIA, #V24CFG, #V24, #ECM, #ECMD, #NWDNS, #SSLCFG, +ODIS, #M2MRUN, #MQCFG, \$GPSCFG, \$GPSNMUN, \$GPSNMUNEX</p> <p>New Commands: #IOTBND</p>
4	2020-04-15	<p>Updated Commands: +IPR, #NWDNS, #SSLSECCFG, #SSLS, +ODIS, #M2MDEL, #M2MRAM</p> <p>New Commands: #USBCFG, #SIMINCFG, #ECM, #ECMD, #SSLI, \$GPSCFG</p>
3	2020-03-02	<p>Updated Commands: #FWSWITCH, #WS46, +CGEREP, +CGDCONT, #SLED, #TESTMODE, #SMTPCFG, #CSURV, #CCIOPT, +CCIOPT, #M2MDEL, #M2MLIST, #M2MMKDIR, #M2MREAD, #M2MRMDIR, #M2MRUN, #M2MWRITE</p> <p>New Commands: +CMSS, +CSODCP, +CRTDCP, #SYSHALT, #ESMTP, #EADDR, #EUSER, #EPASSW, #ESAV, #ERST, #EMAILD, #EMAILMSG, #SSLCFG, #SSLSECCFG2, #SSLSECCFG, #SSLSECDATA, #SSLEN, #SSLD, #SSLO, #SSLH, #SSLSEND, #SSLSENDEXT, #SSLRECV, #SSLS, +ODIS, #OTAUPW, #M2MCHDIR, #M2MRAM, #MQEN, #MQCFG, #MQCFG2, #MQWCFG, #MQTCFG, #MQCONN, #MQDISC, #MQSUB, #MQUNS, #MQPUBS, #MQREAD</p> <p>Removed Commands: #DNS</p>



2	2019-12-18	<p>Updated Commands: #PSNT, #BND, #WS46, +CGAUTH, #QSS, #PADFWD, #QDNS, #FTPCFG, #HTTPCFG, +CCIOTOPT</p> <p>New Commands: A/, #/, &amp;W, +IMEISV, +CMUX, #PORTCFG, #FWSWITCH, #IMSPDPSET, #TID, #CEERNETEXT, +CEREG, +CESQ, #JDRENH2, #JDR4GCFG, #SIMDET, #TESTMODE, #SGACTCFG, #SGACTCFGEXT, #SKTRST, #NTP, #NTPCFG, #DNS, #NWDNS, #SMTPCFG, #CCIOTOPT, #M2MDEL, #M2MLIST, #M2MMKDIR, #M2MREAD, #M2MRMDIR, #M2MRUN, #M2MWRITE, #M2MBACKUP, +M2M, \$GPSP, \$GPSSW, \$GPSNMUN, \$GPSNMUNEX</p>
1	2019-09-10	<p>The document title has been updated: "ME310G1/ME910G1/ ML865G1 AT Commands Reference Guide"</p> <p>A long list of commands has been added, refer to the Contents table</p>
0	2019-05-27	First issue



